

1 Identification

- 1.1 In order to identify yourself copy the following text into the answer field and insert your name and student ID.

I, _____ [full name, matriculation number], hereby confirm in lieu of an oath that I am the person who was admitted to this examination. Further, I confirm that the submitted work is my own and was prepared without the use of any unauthorised aid or materials.

lieu of an oath that...

Part I - Innovation Management**2 Corporate Success Through Market Driven Innovation**

- 2.1 Term "Innovation"
a) What differentiates an Innovation from an Invention?
b) Briefly describe the term Innovation?
Please answer by stitch. Two bullet Points each for a) and b).

Invention is the development of a new product that works
a)- innovation is an invention that can be commercially exploited while an invention is not always commercially exploitable.
- an innovation can be utilised at an operational level while an invention cannot.
b)- Innovation introduces a new product to the market and makes it competitive
- innovations involves dealing with uncertainty

- 2.2 Types of Innovation:
The lecture featured six types of innovations. Name four of these types of Innovation.

Disruptive innovation
fundamental innovation
Adaptive innovation
Imitations

- 2.3 In the lecture, success factors of innovation management have been presented. These have been divided into three groups: the innovation process, resources and organization, and the culture of innovation. For each of the three groups, give two examples:

Innovation process:
- Clear and early project and product definition.
- Adaptability of the innovation process.
Resources & organization:
- Goal-oriented budget planning.
- Support and commitment of top management.
Innovation culture:
- open innovation culture.
- Space for employees to use time at their choice.
- Integration of all employees into the innovation process.

3 Integrated Innovation and Product Management

- 3.1 Product management is an integral part of innovation management. It includes strategic and operational tasks. Name two strategic tasks and two operative tasks.

Strategic tasks
- Strategic options for action
- Definition of the target market

operative tasks
- Product maintenance
- Marketing mix

4 Innovation Strategy

- 4.1 Positioning Analysis is a very important part of the product concept. How do you describe the "Positioning of Products"?

product positioning is the differentiation of a product from the competition based on the subjective perception of customers

- 4.2 There are two strategies for product positioning. Please name them:

Adaptive offerings to customer preferences
Adapting customer preferences to product offerings

- 4.3 What is a "SWOT-Analysis"? Please describe in short sentences.

it is a planning technique that helps people or companies identify strengths, weaknesses, opportunities, and threats of a project or product.

5 Product Concept

- 5.1 For the definition of a product concept very often the method "target costing" is used. What is target costing? How does the basic model look like and what are the process steps?

Target costing is a strategic cost planning, steering and controlling instrument used to determine how much a product is allowed to cost from the perspective of a customer.

Steps

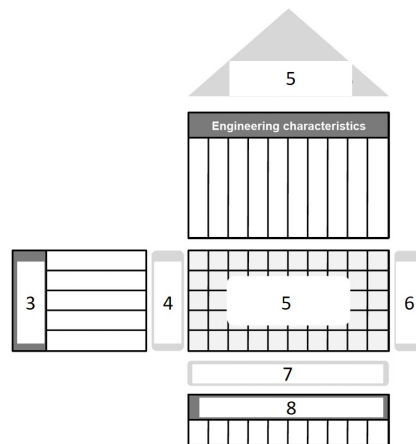
- identification and evaluation of customer requirements
- Rough draft of a new product
- Determination of the target price and derivation of target costs
- weighing of product components and allocation of target costs
- Calculation of the target cost index
- measures for the achievement of target cost

- 5.2 Quality Function Deployment (QFD) is a method for translating the "Voice of the Customer" into "Action of the Developers". Please name four QFD characteristics.

- Consistent focus on customer requirements
- Multiple level planning process using planning and communication matrices
- Measurable technical quality features interwoven with customer requirements
- Use of multi-functional committed teams

- 5.3 The "House of Quality" is a core tool of the QFD Methodology. The sketch shows typical "House of Quality". Please name the different areas/parts of the house of quality. To do this, please assign the appropriate descriptions to the numbers (at the right side of the box).

- 3- Customer attributes
- 4- Relative importance
- 5- roof matrix (includes technical correlations)
- 5- Relationship matrix
- 6- customer perception
- 7- Cost/ technical difficulty/
- 8- objective measures



6 The Front End of Innovation

6.1 Name six characteristics of the "Front End of Innovation".

Fuzzy,
unclear responsibilities,
unstructured,
interdisciplinary,
no documentation
no formalization

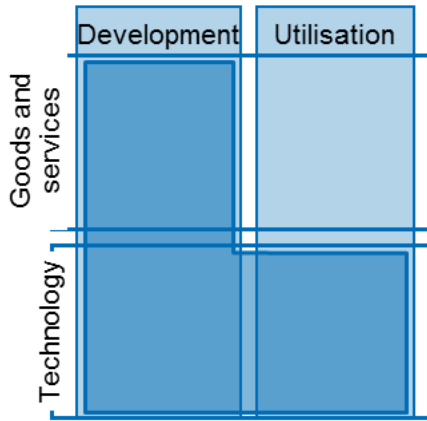
6.2 Which of the following statements is correct

- ☒ ☐ Managing the Front End of Innovation is a continuous conflict between creativity and systematization. ✓
- ☐ ☒ Front End of Innovation can be managed best according to strict process rules and clear hierarchical decision processes.
- ☒ ☐ It is essential to find the right balance between flexibility and creativity as well as between structure and bureaucracy.
- ☒ ☐ Creative problem-solving may very well be subject to structure and regularities.

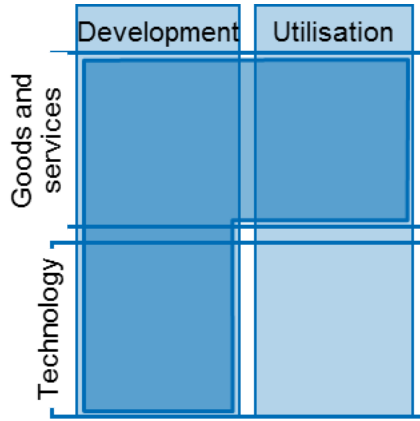
Part II - Technology Management

7 General Questions

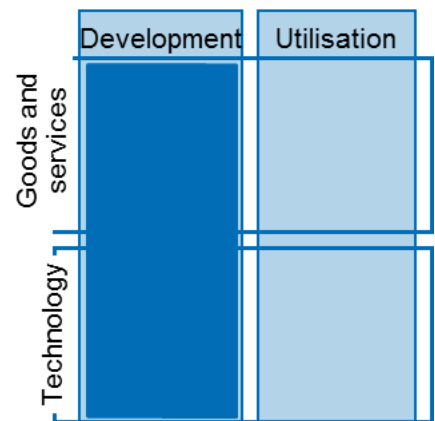
7.1 Which of the three illustrations represents *innovation management* (according to Binder/ Kantowsky)?



☐ The first one ☒ The second one ☐ The third one



☐ None of them



7.2 The appropriate organisational form of technology management depends on several factors. Which of the following does NOT belong to?

- ☐ Depth of added-value ☒ Product contribution margin
☐ Company size ☐ Available resources

7.3 Technology developments are subject to multiple risks. What are the *three* typical risk dimensions companies are faced to in this context?

- ☒ Institutional risks (laws, social acceptance)
☐ Environmental risks (pollution, nitrification, Exhaustion)
☐ Organisational risks (structure, processes)
☒ Market risks (financial, procurement, product)
☒ Development risks (technological, constructively)

7.4 What are contents and decision dimensions of a technology strategy (mark three out of five)?

- ☒ How do we get the technology?
☒ When will the technology be commercially viable?
☐ Who will create the technology strategy?
☒ How close to the state of the art we want to act?
☐ Do we need a technology strategy?

7.5 Companies are exposed to changes in development conditions. Which of the following statements describes the future situation correctly?

- ☒ The development cycles will be shorter; the solution space will be wider.
☐ The development cycles will be shorter; the solution space will be narrower.
☐ The development cycles will be longer; the solution space will be wider.
☐ The development cycles will be longer; the solution space will be narrower.

8 Introduction to Technology Management

8.1 Importance of technologies

Which of the following statements is/are right? (*multiple answers possible*)

- ☐ Products usually have longer life cycles than technologies.
☒ The risk of the rapid substitution of technologies is less than the risk of the substitution of other skills.
☒ Technology Management directs the development and exploitation of technological competencies in a company.
☐ "Technology" and "Technical Equipment" can be used synonymously.

8.2 Dynamics of knowledge

Explain the development of the "solution space" over time ("yesterday - today - tomorrow").
 Please answer in one or two short sentences.

overtime, the development cycle reduces i.e from long to short development cycle from yesterday to tomorrow respectively. Also, over time the solution space increases from a small solution space to a wide solution space from yesterday to tomorrow respectively.

8.3 Possible forms of Technology Management organisation (4 points)

Technology Management as a business function can be organised in different forms. We have discussed seven of them in the lecture.
 Please **name four** of them.

implicit form
 project organisation
 staff organisation
 committee

9 Technology Forecasting

9.1 What are *two* main challenges in technology forecasting?

- ☒ Search for new technological potentials
☐ Evaluate the technological platform
☒ Assessment of technological potentials
☐ Protect the existing technologies

9.2 The three basic activities of strategic forecasting are:

- ☐ Determination, Evaluation, Decision
☐ Planning, Acting, Controlling
☒ Scanning, Monitoring, and Scouting

- ☐ Entering, Checking, Leaving
☐ Huey, Dewey, and Louie

10 Technology Strategy

10.1 Contents and decision dimensions of a technology strategy (2 points)

In the lecture five decision dimensions that have to be taken into account when defining a Technology Strategy have been introduced. What (four) answers are correct?

- ☒ Technology Selection
☒ Technology Timing
☒ Source for Technology
☐ Technology Owner
☐ Group of Technology
☒ Technology Utilization

10.2 Technology Strategy and core competencies (3 points)

Companies should manage their resources systematically rather than to allocate resources according to the "watering-can principle". Why is it so?

Please name **three disadvantages** of the "watering-can-approach" and **three advantages** of a systematic resource management.

Advantages of systematic resource management
 - Transparency
 - utilization maximization
 - uniqueness in competition
 Disadvantages of the watering can approach
 - Lack of transparency
 - Hectic and reaction

10.3 Contents and decision dimensions of a technology strategy (2 points)

There are four criteria of a competency that have to be fulfilled so that a competency is a core competency. **Name these four criteria.**

the competence should be :
 -difficult to replicate
 -valuable
 -should not be substitutable
 -rare

11 Technology Development

11.1 Many companies separate the product and the technology development process. The reasons for this are the different objectives of both processes. In contrast to the product development process the technology development process focuses on... (Attention: Only make ONE cross!)

- ☐ Time, Cost, an Quality
☒ Customer Benefit, Creativity, and Level of Innovation
☐ Price, Cost, and Profit
☐ All the three answers

11.2 One of the core ideas of the TRIZ methodology is to find innovative solutions for concrete problems...

- ☐ efficiently and effectively
☐ directly
☒ by getting standard solutions for standard problems
☐ by using the backward path

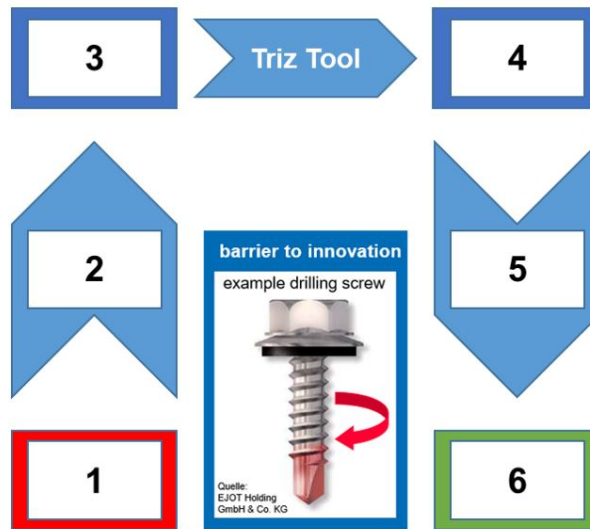
11.3 An essential element of the TRIZ method is the...

- ☐ Evaluation Matrix
☒ Contradiction Matrix
☐ None of them
☐ Proclamation Matrix
☐ Exclusion Matrix

11.4 TRIZ (3 points)

We have introduced the methodology of TRIZ. Please name the six folders in the diagram below to explain the TRIZ approach.

1- concrete problem
 2- abstraction
 3- standard problem
 4- standard problem
 5- Application
 6- Innovative solution



1) _____ 2) _____ 3) _____

4) _____ 5) _____ 6) _____

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