Knowledge Oriented Innovation – a guideline providing systematic support for SME

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Content

- Current status quo and situation
- Innovation process and information management
- Support of innovation management by methods and tools
- Innovation tool box
- Methods within the innovation tool box
- Barriers within the innovation process
- Conclusion
Aims and Goals, Starting basis

- Multitude of challenges; dynamic markets, demanding new and improved products, technological development, rival inventions
- Innovation management insecure and fraught with risk

Management of knowledge and information is an essential key business to reduce the uncertainty of innovation and to improve the probability of successful implementing new products

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Innovation Processes and Information Management

Product development is an exercise in information processing

(Clark, Fujimoto 2001)

But all the organised information cannot substitute tacit knowledge, understanding and learning, which are important resources of the innovation process

(Adamides, Karacapilidis 2006)

Structured and well planned processes for innovation are often lacking in SMEs

(Karapidis et al. 2005)
Innovation process for SMEs

Initiation

I. Problem analysis and strategy definition
II. Idea generating and collecting
III. Rough selection of ideas
IV. Feasibility studies
V. Decision for a realization plan

Results

Innovation strategy
Pool of ideas
Concrete problem solutions
Realization plan
Release for realization
Concrete product/service concept
Prototype
Product
Market acceptance

Idea realization

VI. Concept definition
VII. Development and prototyping
VIII. Production
IX. Distribution and product launch

Innovation methods

Positive correlation between the project execution methods and the project execution success (Study of 120 completed new product development projects) (Tatikonda, Rosenthal 2000)

Use of tools and methods in companies remains marginal (Farris et al. 2003)

What the literature prescribes and what most firms do are miles apart (Cooper, Kleinschmidt 1986)
Innovation management methods and tools (extract)

- Affinity Diagram
- Analogous Studies
- Benchmarking
- Bionic
- Brainstorming
- Brainwriting – Method 635
- Chances-Risks-Analysis
- Checklist for Idea Generation
- Component Tree
- Conjoint-Analysis
- Cost-Benefit-Analysis
- Design Review
- Decision Tree Analysis
- Economical Calculation
- Environmental Analysis
- Experience Curve Analysis
- ...

- Failure Mode and Effects Analysis FMEA
- Feasibility Study
- Function Analysis
- Idea-Delphi
- Innovation Roadmap
- Ishikawa-Diagram
- Lead-User Concept
- Market Analysis
- Mind-Mapping
- Morphological Analysis
- Pairwise Comparison
- Patent Analysis
- Portfolio-Analysis
- Priority Matrix
- Problem Solving Tree
- ...

- Quality Function Deployment QFD
- Relevance Tree Analysis
- Risk Analysis
- Scoring Models
- Sectorial Analysis
- SIL-Method
- SWOT-Analysis
- Synetic
- Szenario Analysis
- Target Costing
- Technology Roadmapping
- TILMAG-Method
- TRIZ
- Value Analysis
- Value Chain Analysis
- ...

Innovation tool box

1. Problem analysis and strategy definition
2. Idea generating and collecting
3. Rough selection of ideas
4. Feasibility studies
5. Concept definition
6. Development and prototyping
7. Production
8. Distribution and product launch

- SWOT Analysis
- GAP Analysis
- Morphol. Matrix
- Brainwriting (BS)
- Inverse Brainwriting
- Vente de l’inverse
- SIL-Method
- Core-comp. Analysis
- Morphol. Matrix
- 635 Brainwriting
- Destruc.-construc. BS
- Screening with k.o.-Criteria
- Simple evaluation method
- Balance of arguments
- Quality function deployment
- Target Costing
- Scoring method
- Pairwise comparison
- Lead User Concept
- Market Information
- Marketing Management
- Cost-Management
- Quality-Management
- R&D - Calculation
- Target Costing
- GAP Analysis
- Product- Market- Analysis
- SWOT-Analysis
- Scenario Method
- Portfolio Methods
- Core-comp. Analysis
- Szenario Method
- Portfolio Methods
- Core-comp. Analysis
- Radical innovation
- Function analysis
- Market analysis
- SWOT-Analysis
- Portfolio Methods
- Core-comp. Analysis
- Szenario Method
- Portfolio Methods
- Core-comp. Analysis
Idea generation phase

Idea generation

I. SWOT-Analysis
II. GAP-Analysis
III. Brain-storming (BS)

Idea generation phase (cont.)

III. Morphol. Matrix
IV. 635 Brain-writing
V. SIL-Method

Idea evaluation phase

Idea acceptance

IV. Scenario Method
V. Portfolio Methods

Idea evaluation phase (cont.)

IV. Inverse Brain-storming
V. Destruc. construc. BS

Screening with k.o.-Criteria

Idea evaluation phase (cont.)

IV. Beginner
V. Advanced

Idea evaluation phase (cont.)

IV. Professional
V. Core-comp. Analysis

Idea evaluation phase (cont.)

IV. Brain-storming (BS)
V. Brain-storming (BS)

Idea evaluation phase (cont.)

IV. Brain-storming (BS)
V. Brain-storming (BS)
# Idea realization phase

## VI. Marketing Concept
- Marketing Management

## VII. Lead User Concept
- Lead User Concept
- Product Clinic
- Conjoint Analysis
- QFD

## VIII. R&D Calculation
- Target Costing
- R&D Calculation
- Product margin

## IX. Quality Management
- FMEA

## Cost Management
- FMEA
- Target Costing

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## Description of methods within the innovation tool box – Target costing

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Evaluation of the criteria</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Depends on the object itself and on the experience of the project leader</td>
<td></td>
</tr>
<tr>
<td>Participants needed</td>
<td>3-7</td>
<td>Team work recommended</td>
</tr>
<tr>
<td>Spatial requirements</td>
<td>1 Room</td>
<td>No further requirements</td>
</tr>
<tr>
<td>Additives needed</td>
<td>Writing material, flip chart, pin board, additional presentation material</td>
<td></td>
</tr>
<tr>
<td>Moderator</td>
<td>Needed</td>
<td>Moderator is responsible for: Coordination of the method</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tracing of the method through its whole cycle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Documentation of the results and the experiences made in the sessions</td>
</tr>
<tr>
<td>Degree of difficulty</td>
<td>high</td>
<td>External assistance and consultancies can be recommended if no experience with this method is available</td>
</tr>
</tbody>
</table>

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Barriers within the innovation process

- Information and communication
  - department focused thinking
  - lack of communication between R&D and marketing; in general between technical and economic functions
- Organizational aspects
  - non-interdisciplinary project teams
  - structure depends upon the level of innovation, the stability of the market and the technical environment
- Cultural aspects
  - lack of support by the top management
  - lack of employee participation and identification
- Sociopsychological aspects
  - employee resistance
  - not-invented-here effect

Conclusion and outlook

- Well structured and transparent procedure to guide the whole innovation process is needed
- Especially SME’s are often lacking methodical and processual knowledge and understanding
- The innovation tool box is a proper and comprehensive tool for giving such aid
- Further research has to be done to provide software aided support and to handle the barriers within the innovation process
Thank you for your kind attention!