Drivers of Innovation for Business Excellence
Tools and Practices for implementing successful innovation

Driving Competitiveness
Delivering Growth and Sustainable Jobs
29th May 2013
Dublin Castle, Ireland

Dr.-Ing. Holger Kohl
Director Corporate Management

Fraunhofer Institute
Production Systems and Design Technology
Agenda

1. The Fraunhofer-Gesellschaft
2. Innovation and its Drivers
3. Rules for Successful Innovation
4. Intellectual Capital and Benchmarking
The Fraunhofer-Gesellschaft

The Fraunhofer-Gesellschaft is the leading organization for applied science in Europe. It strives for application-oriented research regarding the direct benefit for enterprises as well as for the advantage of society.

- more than 80 research facilities, including 60 Fraunhofer-Institutes
- The majority of more than 22,000 staff are qualified scientists and engineers
- Euro 2,0 billion annual research budget, including Euro 1,5 billion contract research.
  - 70% are contributed by industrial contracts and publicly financed projects.
  - 30% basic funding of the Federal and Länder Government.
- Research centers and representative offices in Europe, USA, Asia and in the Middle East
From a small association to the leading organization for applied research in Europe

Number of institutes

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Staff

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<td>7980</td>
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Budget in € (millions)

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<td>180</td>
<td>350</td>
<td>580</td>
<td>710</td>
<td>1069</td>
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Fraunhofer IPK, Berlin

Corporate Management
- Management of Intellectual Capital
- Management of Innovation Systems
- Benchmarking
- Balanced Scorecard
- Corporate Planning and Logistics
- Knowledge Management
- Process Management
Development of Economy - Innovation System

National Wealth

Innovation

World standard products

Competitive production processes

Benchmarking

Intellectual Capital

Human Capital
Use technology

Structural Capital
Manage technology

Relational Capital
Communicate technology

Intellectual Capital Statements
Agenda

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Then and now – Genesis of Innovation Activities

- Partial and gradual Innovations
- Regionally restricted
- Based on laws of nature
- Innovations by **Individuals**

- Conversion to science towards civil enlightenment
- **Market-oriented** Innovations

- **Interconnected** multi-layer interplay of market participants
- **Complexity** of innovations induces international collaborations

Antiquity  Middle Ages  Present
Characteristics of successful Innovators

- A Clear Strategy
- The Best Team and Work Environment
- The Unrelenting Will to Succeed
- Ongoing Quality Control and Result Monitoring
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Innovation for Driving Competitiveness

Which are the most significant factors for growth and profitability increase?

Source: Arthur D. Little; Innovation Excellence Study,
Structured Processes to identify new Markets

**Perspectives for future Markets**
- Foresight analysis and trend studies
  - 50 Technology Trends
    - Workshop >50 Experts
    - Market Perspectives: 12

**Fraunhofer Frontline Themes**
- Global Megatrends
  - Survey of 170 Topics among Executives
    - Ranking of Topics: 25 Focus-Topics
      - 12 Frontline Themes

**Markets of the future**
- Grand societal challenges
  - Technological solutions
    - Mapping with Fh-Competence
    - Fraunhofer internal call
    - Future Markets: 5

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## 5 Future Markets

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<tr>
<th>Climate / Energy</th>
<th>Sustainable Cities</th>
<th>Intelligent transformation of energy supply</th>
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<tbody>
<tr>
<td>Health</td>
<td>Individualized Healthcare</td>
<td>Self-determined life in seniority</td>
</tr>
<tr>
<td>Mobility</td>
<td>Electromobility</td>
<td>Affordable CO₂-optimized mobility</td>
</tr>
<tr>
<td>Safety</td>
<td>Safe Cloud made in Germany</td>
<td>Secure Identities</td>
</tr>
<tr>
<td>Communication</td>
<td>Internet of the Future, Green IT &amp; IT for Green Digital Knowledge Society based on acceptance and participation</td>
<td></td>
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>>Valley of Death<< of Innovation as a challenge for innovation systems
>>Valley of Death<< of Innovation as a challenge for innovation systems
Overcoming the "Valley of Death" of Innovation

High-Level Expert Group on Key Enabling Technologies recommends Advancement and Stimulation of:

1. Technological Research (RTOs)
2. Lab-Fabs (small production lines - prototype cells)
3. Globally Competitive Fabs
4. Planned Buy-Out

Characteristics of the Fraunhofer 4D Advancement Process:

- Applied, technological Research and product-oriented development
- Demonstrators and Production Processes from Pilot-Plants under real-life conditions (Lab-Fabs)
- Competitive Pilot-Production high-volume production (Global-Fabs)
- Pre-Planned Buy-Out
Why Measuring Intellectual Capital (IC)?

- The **organizational value** consists of tangible and intangible assets, which are mostly undocumented in traditional accounting systems.

- **Investors** (Rating according to Basel II) demand plausible evidence of corporate values. Companies in knowledge-intensive fields have difficulties in proving their value to investors.

- **Legal regulations** commit organisations to legitimate their intangible assets. (Austrian UOG, IAS 38, DRS 12 and 5)

Microsoft Corporation 1978

Would you have invested?
National IC Report: Average Impact of Intellectual Capital on Business Success

Source: Survey Results „Knowledge Economy Germany“, Fraunhofer IPK 2010 (N=1.000)
What is an Intellectual Capital Statement?

An Intellectual Capital Statement is an instrument for the focused description and development of the Intellectual Capital in an organisation.

Intellectual capital (IC) is defined as “existing knowledge of an organisation that contributes to future success” and is subdivided into three categories:

- **Human Capital** (HC), e.g. qualification, leadership, motivation
- **Structural Capital** (SC), e.g. innovation, knowledge transfer
- **Relational Capital** (RC), e.g. relations to customers, partners
Impact of ICS on Financial Analysts’ Assessment of Future Earning Potential

Main Results of the German ICS Pilot Project

- **Efficient method** to start IC Management in SMEs.
- **Guideline for ICS implementation** in German and English language published, more than 100,000 copies distributed.
- **Software “Wissensbilanz-Toolbox”** available since July 2006, more than 50,000 copies distributed.
- **Financial Times and Commerzbank Award 2005** for one of the first 14 Pilot-SMEs
- **40 Roadshows** for entrepreneurs with more than 1,500 participants.
- More than 300 users and trainers trained

www.akwissensbilanz.org
Common Definition of Benchmarking

Benchmarking is a systematic and continuous process, where the own performance is measured and compared with Best Practices in order to identify improvement potential.
# Top 10 Management Trends and Practices 1993-2010

|------|---------------------------------|--------------------------|--------|------------------------|----------------|------------------------|------------------|---------------------|----------------------|------------------------|

Source: Bain & Company - Management Tools and Trends 2011
Main productivity-obstruction in Germany

- 74% Classical management errors
  - 45% Poor planning and control
  - 17% Lack of supervision and leadership
  - 12% Lack of communication

As well as

- Lack of qualifications
- IT Problems
- Lack of working morale

The value creation in Germany’s SME’s can be increased by € 200 billion!

Source: Czipin & Proudfoot Consulting GmbH
Current Distribution of the BenchmarkIndex

Current Candidates:
- Russia
- Brazil
- Croatia
- Saudi Arabia
- Kuwait
- Bahrain

> 80,000 Financial Data
> 22,000 Benchmarking-Data

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Causes-Effects-Relationship for measure „Total Turnover Grows“

- **Financial Perspective**
  - Total Turnover Growth [%]

- **Customer Perspective**
  - Customer Growth [%]
  - Sales on new Products and Services [%]

- **Learning & Growth Perspective**
  - New Products and Services [%]
  - R & D Expenditures [%]

- **Process Perspective**
  - Product to Market [Months]
<table>
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<tr>
<th>Ratios</th>
<th>Relative</th>
<th>Your actual</th>
<th>Weakest</th>
<th>Weak</th>
<th>Median</th>
<th>Strong</th>
<th>Strongest</th>
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<td>1 Net Profit Margin (%)</td>
<td>28</td>
<td>3.22</td>
<td>-14.92</td>
<td>3.02</td>
<td>7.00</td>
<td>12.70</td>
<td>31.42</td>
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<td>2 Return on Capital Employed (ROCE) (%)</td>
<td>17</td>
<td>7.74</td>
<td>-261.82</td>
<td>15.81</td>
<td>33.62</td>
<td>67.41</td>
<td>199.04</td>
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<td>3 Return on Net Assets (RONA) (%)</td>
<td>17</td>
<td>7.74</td>
<td>-110.86</td>
<td>14.05</td>
<td>34.48</td>
<td>69.79</td>
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<td>4 Return on Total Assets (ROTA) (%)</td>
<td>33</td>
<td>7.60</td>
<td>-49.00</td>
<td>6.60</td>
<td>14.94</td>
<td>27.92</td>
<td>61.14</td>
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<td>5 Fixed Costs as a Percentage of Sales (%)</td>
<td>98</td>
<td>28.39</td>
<td>99.76</td>
<td>83.24</td>
<td>67.49</td>
<td>55.57</td>
<td>27.00</td>
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<td>6 Staff Costs as a Percentage of Sales (%)</td>
<td>11</td>
<td>64.38</td>
<td>76.49</td>
<td>61.60</td>
<td>50.56</td>
<td>38.86</td>
<td>29.03</td>
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<td>7 Value Added as a Percentage of Sales (%)</td>
<td>90</td>
<td>96.46</td>
<td>36.46</td>
<td>63.90</td>
<td>76.92</td>
<td>87.53</td>
<td>98.56</td>
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Concept for an Enterprise Support Center

Development Center for Competitiveness & Innovation
Strategic Cluster Development

Innovation Support
- Engineering
- R&D Services
- Process Optimization
- Management Systems

Performance Analysis
- BMI
- Strategic Planning
- Innovation Audit
- Cluster Monitoring

Best Practice Transfer
- Visiting Program in selected areas
  - QM
  - HRM
  - Market Analysis
  - Performance Management
  - Advisory Board
  - Auditors

Best Practice Award
- Factory / Cluster
- BMI Data for Best Factory Award System
- Annual Ceremony
- TOP 20 Enterprises

Funding Systems for SMEs
- Integration in international clusters
- Direct support for Integration of Strategic SMEs
- International R&D Programs

Export Support
- Quality Requirements
- Packaging
- Legal Issues
- Tariffs
- Matchmaking with strategic industry clusters

Consultant Register
(external and internal)

Assessment Tool for funding applications

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