Intellectual Capital as a Driver for Innovation in the Automotive Industry

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Dr.-Ing. Markus Will
Head of Fraunhofer IPK Project Office Brazil
Division Corporate Management
Fraunhofer IPK
Berlin - Germany
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Business Excellence Methods
R. Orth
- Process oriented integrated management systems (Quality, Environment, Health, Risk)
- Business Excellence
- Balanced-Scorecard-Systems
- Benchmarking
- Process based Knowledge Management
- Intellectual Capital Statement

IPK Project Office Brazil
Dr.-Ing. Markus Will

Information Centre
Benchmarking
Oliver Riebartsch

Competence Center
Knowledge Management
Sven Wuscher

IPK Project Office Brazil
Dr.-Ing. Markus Will
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Innovation in European Companies

Competition on Productivity and Cost Efficiency is rather short-term oriented than Innovation based on strategic Intellectual Capital Management

For European Companies, Innovation becomes more important than Cost Leadership
The Big Picture: Three Pillars for Sustainable Development of the Economy

Economic Wealth

Regional, National and Transnational Innovation Systems

World Standard Products

Competitive Production Systems

Intellectual Capital
- Human Capital: Use intangible assets
- Structural Capital: Manage intangible assets
- Relational Capital: Communicate intangible assets

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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
Impact of Intellectual Capital on Business Success

- Human Capital: 8.1
- Structural Capital: 7.1
- Relational Capital: 6.3
- Tangible Resources: 5.1

Source: Survey Results „Wissensstandort Deutschland“, Fraunhofer IPK/ Arbeitskreis Wissensbilanz, 2010
92% of German managers think that Knowledge Management is important or very important for their business success.

75% are not satisfied regarding the actual handling of knowledge within their company.

80% identify a high need for action in terms of a „strategic, knowledge-oriented enterprise planning“!

→ Managing Innovation, Human Factors and Complexity!
The need for integrated management instruments: The Knowledge Management Cycle

**Strategic Perspective**

- **Intellectual Capital Statements**

**Operative Perspective**

- **Knowledge Management**
  - Create knowledge
  - Apply knowledge
  - Store knowledge
  - Distribute knowledge

**Deduct initiatives and actions**

Measure success
Main Results of the ICS Pilot Project - “Wissensbilanz – Made in Germany”

- **Efficient method** to start IC Management in SMEs.
- **1,000 Intellectual Capital Statements** implemented in SMEs.
- **100,000 support materials** (guidelines, brochures and software “Wissensbilanz-Toolbox”) distributed.
- **240 ICS Moderators** have been trained by the Fraunhofer Academy.
- **380 online articles and 57 print articles** have been published, reaching 172 mil. readers (online) and 13,4 mil. readers (print).
- **2,500 participants** were informed about the application of the “Wissensbilanz – Made in Germany” at conventions, symposia and workshops.

www.akwissensbilanz.org
The InCaS Project (2006-2008)
Objectives & Results

- Strengthen European SMEs’ competitiveness and innovation potential
- Establish Intellectual Capital Statement (ICS) as the strategic management and reporting tool for the knowledge driven economy
- Develop a pragmatic methodology for European SMEs, harmonising existing approaches
- Implement, test and improve the method in 25 SME in five EU countries
- Provide a European ICS Guideline and supporting software “ICS toolbox”
- Disseminate the project results throughout Europe

www.incas-europe.org

European ICS Guideline

ICS Toolbox

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ICS Qualification Concept for Quality Assurance

ICS-Moderator (Level 1):
✓ Basics ICS method
✓ Case Studies

ICS-Moderator (Level 2):
✓ Moderation of 1 ICS
✓ 1 approved ICS

Certified ICS-Moderator (Level 3):
✓ Additional theory
✓ Moderation of 1 ICS
✓ Submission of 1 ICS as exam paper
✓ Written and oral examination
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Holistic Knowledge Management Concept

I. KM Strategy and Analysis
   - How can KM support our business goals?
   - Where should we invest?

II. KM Solutions and Process Design
    - What are the appropriate KM Tools and methods?
    - How should we design our business processes?

III. KM Implementation and Development
    - How can we implement KM in a sustainable way?
    - What are meaningful measures?

KM Controlling
Did we achieve our goals?

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Fields of Use and Benefits of Intellectual Capital Statements (ICS)

- **Diagnosis**: ICS as an instrument for analysing strengths and weaknesses of strategic IC factors.
- **Decision Support**: ICS as an instrument for prioritising fields of improvement with highest impact.
- **Optimisation & Innovation**: ICS as an instrument for implementing actions for organisational development.
- **Internal Communication**: ICS as an instrument for enhancing transparency and employees’ involvement.
- **Monitoring & Risk Management**: ICS as an instrument for controlling strategic risks and measuring success of actions.
- **Reporting**: ICS as an instrument for communicating corporate value to stakeholders.
The ICS Framework: Structural Model

**Business environment**
(Possibilities & risks)

**Organization**

- Initial situation
  - Vision
  - Business strategy knowledge
  - Measures

**Intellectual capital**
- Human capital
- Structural capital
- Relational capital
- Other resources

**Business processes**

**External impact**
- Business success

**Other resources**
- Initial situation
- Human capital
- Structural capital
- Relational capital

**Knowledge processes**

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Standard IC Factors

**Human Capital**
- Professional Competence
- Social Competence
- Employee Motivation
- Leadership Ability

**Structural Capital**
- Internal Co-operation and Knowledge Transfer
- Management Instruments
- IT and Explicit Knowledge
- Product Innovation
- Process Optimisation and Innovation
- Corporate Culture

**Relational Capital**
- Customer Relationships
- Supplier Relationships
- Public Relationships
- Investor Relationships
- Relationships to Co-operation Partners
Assessment of IC Factors on the Basis of Three Dimensions: Quantity, Quality, Systematic (QQS)

• Are the product innovations good enough according to the strategic requirements?
• How systematically do we manage our product innovations?
• Do we have enough product innovations according to the strategic requirements?

0% = not sufficient
30% = partly sufficient
60% = mostly sufficient
90% = always sufficient
Assessment of Intellectual Capital and Prioritization of Fields of Action

Example of a Software Company

Impact Analysis

<table>
<thead>
<tr>
<th>Field</th>
<th>BP-1</th>
<th>BP-2</th>
<th>BS-1</th>
<th>BS-2</th>
<th>IC-1</th>
<th>IC-2</th>
<th>IC-3</th>
<th>IC-4</th>
<th>SC-1</th>
<th>SC-2</th>
<th>SC-3</th>
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<tr>
<td>Acquisition</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
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<td>2</td>
<td>2</td>
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<tr>
<td>Product Development and Product Innovation</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Service &amp; Customer Support</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Quality</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Systematic</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>Impact Analysis</td>
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IC Management Portfolio

Potential to be developed

Example of a Software Company
Derive Monitoring System for Continuous Management of Actions

IC factor

Indicators

<table>
<thead>
<tr>
<th>Structural Capital</th>
<th>Reporting period</th>
<th>Evaluation</th>
<th>Goal for the next period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Innovation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of new products</td>
<td>1</td>
<td>2</td>
<td>☹</td>
</tr>
<tr>
<td>Number of upcoming products</td>
<td>1</td>
<td>3</td>
<td>☹</td>
</tr>
<tr>
<td>Number of patent</td>
<td>5</td>
<td>7</td>
<td>☹</td>
</tr>
<tr>
<td>Share of Turnover of New Products…</td>
<td>5%</td>
<td>7%</td>
<td>☹</td>
</tr>
</tbody>
</table>

Example from a Software Company
Integration of Intellectual Capital Statement and Balanced Scorecard

1. Assessment of intangible assets in respect to strategic objectives
2. Prioritising fields of intervention, deriving action plan
3. Indicators and target values
4. Status Quo of IC Development

Intellectual Capital Statement (ICS)

Balanced Scorecard (BSC)

Qualitative / bottom-up

Quantitative / top-down

Strategic Objectives

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Intelectual Capital Statement of an Automotive Company‘s Service Organization

Handlungsfeld 1:
- BK-1: Beziehungen zu VDS Serviceregionen
- HK-1: Basisqualifikation und Erfahrung
- SK-3: IT-Infrastruktur und Systeme
- SK-4: Medien und Informationskanäle

Handlungsfeld 2:
- HK-2: Organisationsfähigkeit
- SK-5: Projektmanagement und Innovationsprozesse
- HK-3: Innovationspotenzial
Der Weg zur Innovation – Die Initialisierungsphase

 Initialisierungsphase

- Auf welchen Wegen kommen Ideen nach Wolfsburg?
- Wie werden Ideen gesammelt und gebündelt?
- Wie werden Ideen für innovative Projekte in das Management gesteuert?

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Geschäftsprozessorientiertes Wissensmanagement (GPO-WM) am Beispiel eines Automobilherstellers

Fehlerabstellprozess (FAP)

- Änderung der Baugruppe bei Nachfolgmodell
- Änderung der Komponente oder Zulieferteil
- Änderung der Lieferung (z.B. Teileaustausch)
- Problemmeldung/Sofortlösung

1. Produkt-entstehung
   - Konstrukteur
   - CAD-System

2. Fertigung
   - Produktions-mitarbeiter/Einkauf
   - PDM-System

3. Vermarktung
   - Verkäufer/Disponent
   - Lieferdaten

4. Service
   - Werkstatt-mitarbeiter
   - Fehler-DB
ICS Pilot Project in Rio de Janeiro (2011)

„ICS Factory“
Ten pilot companies from the oil & gas sector implementing first ICS in Brazil

Project Partners

SEBRAE

PUC RIO

Fraunhofer IPK
Feedback from Pilot Companies in Rio de Janeiro

The ICS helps me to...

- Reflect and refine the business strategy: 13 strongly agree, 3 agree, 6 partly, 1 disagree
- Analyse strengths and weaknesses: 11 strongly agree, 6 agree, 7 partly, 3 disagree
- Prioritise improvement opportunities: 8 strongly agree, 8 agree, 7 partly, 1 disagree
- Derive and implement actions: 10 strongly agree, 7 agree, 6 partly, 3 disagree

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Business Model of SENAI Innovation Institutes

Resources
- Human Capital
- Structural Capital
- Relational Capital

Business Processes
- Strategic Management Processes
- Value Adding Core Processes
  - Marketing & Sales
  - Applied R&D / Innovation
  - Project Management
- Administration & Support Processes

Business Success
- BS-1: Image & Reputation
- BS-2: Financial Sustainability
- BS-3: Growth of National Innovation System
- BS-4: Competitiveness of Industry

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Strategic Success Factors of Applied R&D Institutions as a Basis for Assessment of Actual Status and Gap Analysis

- Human Capital:
  - Strategic Orientation
  - Professional Competence
  - Communication Competence

- Structural Capital:
  - Technology & Knowledge Management
  - Organization and Management
  - Scientific-Technical Equipment

- Relational Capital:
  - Relationship to Industry
  - Relationship to Science / R&D
  - Relationship to External Sources
The QQS-Portfolio shows/describes the strengths and weaknesses of the Resources / Intellectual Capital of the ISI

- HC → Human Capital
- SC → Structural Capital
- RC → Relational Capital

The results are used to determine the Gaps and prioritize fields of action
**HC1:** Quality of Strategic Orientation is good but there is a need to spread this to other employees, the institute implements already a systematic approach

**HC2:** Number of staff as well as the quality of processional competences must be improved, A course of action has been already implemented but it must be more evident

**HC3:** ISI does not possess all necessary skills for communication in R&D, The systematic for changing this scenario is not yet defined
Implementation Roadmap ISI Automation Technology
Short-term impact (2013)

<table>
<thead>
<tr>
<th>Human Capital</th>
<th>Structural Capital</th>
<th>Relational Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select candidates</td>
<td>Define ISIs purchasing process</td>
<td>Integrate ISI topics into &quot;SENAI Tour&quot;</td>
</tr>
<tr>
<td>Hire technical staff (25 engineers)</td>
<td>Refine Mission / Strategy of ISI</td>
<td>Define Plan for accreditation at funding agencies</td>
</tr>
<tr>
<td>Define technical Qual. Plan (technical and practical)</td>
<td>Define standards for project cost control</td>
<td>Develop Marketing Strategy Plan</td>
</tr>
<tr>
<td>Integrate courses on Project Mgt. and Problem Solving</td>
<td>Develop ISI Portfolio</td>
<td>Set Objectives for Phases of Sales Process (“Sales Funnel”)</td>
</tr>
<tr>
<td></td>
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<td>Run Technological Surveillance</td>
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<td>Develop Concept for specific ISIs visits</td>
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<td></td>
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<td>Identify and produce show cases from ongoing R&amp;D projects</td>
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<tr>
<td></td>
<td></td>
<td>Optimize existing website</td>
</tr>
<tr>
<td></td>
<td></td>
<td>List and prioritize associations (Industry, R&amp;D and political level)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Negotiate Memberships at associations</td>
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<td></td>
<td></td>
<td>Organize Technological weeks for 2014</td>
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Summary of ISI Objectives in Strategy Map

Example Innovation Institute

- **Image & Reputation**: Recognition as state-of-the-art R&D service provider
- **Financial Sustainability**: Significant growth of public & private revenues
- **Growth of National Innovation System**: National market leader & international reference
- **Competitiveness of Industry**: Contribution to industry’s productivity & innovation ability

**Business Success**

- **High Level R&D Network**: Access to strategic R&D partnerships, Readiness for international requirements
- **Marketing & Sales**: Attract customers, Capture demands, Manage proposals and client relationships
- **Human Capital**: Strategic orientation, Professional competence, Communication competence

**Business Processes**

- **Professional Solutions**: Pro-active responses to future challenges in production value chain & strategies
- **R&D / Innovation**: Deliver state-of-art solutions by performing R&D projects in Automation Technology
- **Structural Capital**: Technology & Knowledge Mgt., Organization & Management, Scientific-Technical Equipment

**Resources**

- **Project Management**: Manage customer expectations by meeting requirements regarding scope, timing & costs
- **Relational Capital**: Industry Relationship, Relationship to Science, Relationship to external sources

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Consolidation of Business Units’ Intellectual Capital Statements to one corporate statement

Corporate Intellectual Capital Statement
Monitoring Change: Time Series in a (continuous) ICS

### Human Capital
- Professional Competence
- Management- and Social Competence
- Motivation

### Structural Capital
- Corporate Culture
- Communication and Organisation
- Innovation

### Relational Capital
- Relations to Co-operation Partners
- Stakeholder Relations

### Graphs
- Human Capital: Professional Competence, Management- and Social Competence, Motivation
- Structural Capital: Corporate Culture, Communication and Organisation, Innovation
- Relational Capital: Relations to Cooperation Partners, Stakeholder Relations

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Impact of ICS on Assessment of Future Earnings Potential

Thank you for your attention!

Dr.-Ing. Markus Will
Head of Fraunhofer IPK Project Office Brazil
Fraunhofer IPK
Division Corporate Management
Pascalstraße 8-9
10587 Berlin
Germany

markus.will@ipk.fraunhofer.de
+49(0)30 / 390 06 304
+49(0)30 / 393 25 03
http://www.um.ipk.fraunhofer.de