Overview of case studies: Germany

Case study: Nanotron Technologies GmbH (June 2011)
Summary

- Example of the application of the ISO methodology

- Nanotron technologies: Information and Communication technologies (ICT)

- Credits
  - Technical University Berlin: Mr. Hannes Langer (Student, Economics and management)
  - Supervisors: Prof. Dr. Knut Blind (Technical University Berlin, Innovation economics), Mr. Heinz Gaub (DIN), Dr. Jens Albers (Nanotron Technologies)
Company overview - 1

- Nanotron was founded in 1991 and started in 2001 to develop its own technology
- Nanotron has developed products on the basis of the patented chirp-technology
- Nanotron's current product portfolio is used in applications for the localization of the physical position and identification of persons and objects as well as for the installation of intelligent sensor networks
- Nanotron uses chirps, radio-frequency modules and developer kits and subsystems, which are used as a reference for final products
- Number of employees (in 2011): 25 (in Berlin, Germany)
Company overview - 2

- The production of Nanotron products is outsourced

- Sales of Nanotron: 36% in the consumer sector, the rest relies on sales in different industries

- Nanotron products are sold in the following countries and regions:
Nanotron’s product portfolio

Development stages & relationship between Nanotron products

Types of Nanotron products

Reference products developed by Nanotron are the Child Loss Protection System (CLOPS), the Pet Fencing System, Real Time Location System (RTLS)-Tags and RTLS-Anchors. The Child Loss Protection System supports parents and teachers in monitoring children to be in a "safe environment". With support of the Pet Fencing System it is possible to encircle gardens with virtual fences to restrict the movement of animals. RTLS-anchors are used to set up networks for the localization of several RTLS-Tags.
Parts and components are e.g. chips, modules and interface components. The network infrastructure includes connecting and transmission networks as well as office networks. Terminal devices can be telephones, computers and localization hardware such as tags and anchors. Communication services transmit the signals. Applications are - amongst others - e-commerce and e-government as well as localization. The main use of communication consists in transactions, information collection and the areal localization. Software is needed in each stage of the value chain to control the hardware. Service providers offer services in the form of consulting, training and other forms of support.

Case study: Nanotron
The segments of the industry value chain covered by Nanotron are marked in red.
Model of a company value chain (M. Porter)

A company value chain & the business functions « A » to « I » that constitute the Value Chain

Case study: Nanotron
Focus of the assessment of the impacts of standards on business functions in Nanotron (highlighted)

- A: Management & Administration
- B: Research & Development
- C: Engineering
- D: Procurement
- E: Inbound Logistics
- F: Production / Operations
- G: Outbound Logistics
- H: Marketing & Sales
- I: Customer services

Note: Research & Development in Nanotron combines the segments «Parts & components», «Terminal devices» and «Software» in the industry value chain.
Key value drivers

Based on interviews with executive management of Nanotron the following areas have been identified as key value drivers:

– Strong focus on R&D and new product development

– High capability in the definition and management of internal processes

– Pro-active involvement in the development of key standards

– Marketing & Sales capability: Standards are used as a strategic tool to gain customer confidence
Attitude of Nanotron towards standardization

- Nanotron is actively involved in standards committees nationally and internationally and has shaped some key standards used in Nanotron’s own products, in particular ISO/IEC 24730 *Information technology -- Real-time locating systems (RTLS)*

- The company considers involvement in standards development and application of standards as a key to market access and market creation and as a key to business success
## Use of standards in Nanotron

<table>
<thead>
<tr>
<th>Standard - Typ</th>
<th>Standard reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product standards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ISO/IEC 24730-5</td>
<td></td>
<td>RTLS - Air interface applying CSS at 2,4 GHz</td>
</tr>
<tr>
<td>IEEE 802.15.4a</td>
<td></td>
<td>Wireless MAC- and PHY-specifications for low rate Wireless Personal Area Networks (LR-WPANs)</td>
</tr>
<tr>
<td><strong>Process standards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN EN ISO 9001</td>
<td></td>
<td>Quality management system standard:</td>
</tr>
<tr>
<td><strong>Conformity standards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ETSI: R&amp;TTE Directive 1999/5/EC</td>
<td></td>
<td>Radio admission for 2,4 GHz CCS Low Power RF transceiver (ETSI)</td>
</tr>
<tr>
<td>FCC: regulations Part 15C</td>
<td></td>
<td>Radio admission for RF transceiver in the range of 2,5 GHz (FCC)</td>
</tr>
<tr>
<td>Japan’s ARIB STD-T66</td>
<td></td>
<td>Radio admission for 2,4 GHz CCS Low power radio equipment (ARIB)</td>
</tr>
</tbody>
</table>

Case study: Nanotron
## Impacts of standards in Nanotron

<table>
<thead>
<tr>
<th>Company unit</th>
<th>Standards</th>
<th>Main impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>ISO/IEC 24730, IEEE 802.15.4</td>
<td>- More precise product specifications</td>
</tr>
<tr>
<td>Marketing</td>
<td>ISO/IEC 24730, IEEE 802.15.4</td>
<td>- Creation of a global market&lt;br&gt;- Costs for the development of standards</td>
</tr>
<tr>
<td>Sales</td>
<td>ISO/IEC 24730, IEEE 802.15.4</td>
<td>- Reduced time-to-market&lt;br&gt;- More efficient product description&lt;br&gt;- Confidence in the product</td>
</tr>
<tr>
<td>Management</td>
<td>DIN EN ISO 9001</td>
<td>- Shorter processes and workflows</td>
</tr>
</tbody>
</table>
## Calculation of the economic benefits of standards

<table>
<thead>
<tr>
<th>Company unit</th>
<th>Impacts</th>
<th>Operational indicators</th>
<th>Contribution (of sales revenue)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>Precise product specifications</td>
<td>time savings (in %)</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Reduced time-to-market</td>
<td>loss in revenue in case standards would not be applied (in %)</td>
<td>3%</td>
</tr>
<tr>
<td>Marketing &amp; Sales</td>
<td>More efficient product descriptions</td>
<td>time savings (in %)</td>
<td>1%</td>
</tr>
<tr>
<td></td>
<td>Confidence in the product</td>
<td>loss in revenue in case standards would not be applied (in %)</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>Creation of a global market</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Costs due to participation in the development of the standard</td>
<td>estimation (of the absolute value)</td>
<td>-4%</td>
</tr>
<tr>
<td>Management</td>
<td>Shorter processes and workflows</td>
<td>time savings (in %)</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td>EBIT Impact (total)</td>
<td></td>
<td>33%</td>
</tr>
</tbody>
</table>

Case study: Nanotron
Results

- The contribution of standards as a percentage of the total sales revenue of Nanotron amounts to 33%.

- The impact is very high and related to Nanotron’s participation in standardization by having a first-mover advantage being able to shape relevant markets.

- Standards are in particular important for products based on new technology. Standards build customers confidence in the persistence and reliability of new technology.

- The importance of the contribution of standards decreases as competing products enter the market and the market size increases.

Case study: Nanotron
Additional considerations

- Knowledge and contacts gained due to pro-active participation in standards development committees is important as well as the opportunity for an exchange of information with other market players.

- Standards are key in the cooperation between the R&D-function in Nanotron and manufacturing companies to which Nanotron has outsourced the production of its products.

- Marketing and Sales can assist in the procurement of externally manufactured parts by specifying relevant requirements through references to standards.
Thank you for your attention!

http://www.iso.org