Developing a Sustainable Value Proposition for an Industrial Monitoring System

Summary of Master's Thesis
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Developing a Sustainable Value Proposition for an Industrial Monitoring System

Research objective

This Master’s thesis is a case study that focuses on the development of the customer value proposition of Outotec’s CellSense -monitoring system for electrolytic metal refining processes. The aim is to find out the key benefits provided by the system and verify their value. As CellSense also decreases the environmental impacts of the refining process and improves the working conditions for employees, the concept of sustainability is also incorporated in the value proposition. The main research questions in the study are:

1. What are the key features of the value proposition of CellSense, and how do they compare to competing offerings?
2. What are the unique features of the value proposition in different customer segments?
3. How could the key features of the value proposition be verified?

Methodology

This study utilized a qualitative case study research method and included interviews with a total of 12 respondents from Outotec, and seven respondents from two different customer companies. The respondents were chosen on the basis of their experience with CellSense and included a diverse set of backgrounds, from managers to technical experts and sales personnel. The interviews were conducted mostly face-to-face, and later transcribed for further analysis. Technical documents and sales presentations relating to CellSense were used as a secondary data.

Findings

The process to develop a sustainable value proposition for CellSense is pictured in figure 1. The interviews were conducted at Outotec and the customer companies provided information about the perceived key benefits. Next, the benefits were compared to competitive products and selected customer segments were analyzed to find out which benefits are the most important ones to them. The final step of the process was making a verification tool for the key benefits using life-cycle profit (LCP) and life cycle assessment (LCA) methodologies. The data for the verification tool was based on supplier assessments since the customers didn’t yet have enough verified data on the realized benefits. The benefits were divided into the three commonly used dimensions in sustainability literature: economic, environmental and social; also called the triple-bottom line.

Figure 1: Developing a targeted value proposition for CellSense.
Answers to Research Questions

Research question 1: What are the key features of the value proposition of CellSense, and how do they compare to competing offerings?

The most important benefit of CellSense was perceived to be its effect on removing short circuits from the electrolysis. Removing the short circuits is still dependent on the plant personnel but CellSense allows them to optimize their work and react faster to the removal of short circuits. Short circuits have an adverse impact on the energy usage and quality of the end product, so it affects the performance and quality terms of the OEE equation. The second main benefit of CellSense was the process knowledge that it provides, which can allow future improvements to the process, increasing its performance.

The main advantages of CellSense compared to its competition were found to be its wireless nature and temperature measurement. The lack of wiring greatly reduces the need for maintenance and provides ease of installation. The main competitive product of CellSense is also wireless, but relies on batteries instead of utilizing the current of the process, which decreases dependability and increases maintenance costs. CellSense’s competitors also do not include temperature measurement, which gives CellSense a competitive advantage since temperature control can potentially speed up the start-up of the process after downtime, increasing the availability factor.

Research question 2: What are the unique features of the value proposition in different customer segments?

The four customer segments that were analyzed were plant projects under construction, or Greenfield projects; plants under operation; plants in developed countries and plants in China. The segment specific features relating to the sales process are listed below:

1. Greenfield projects – CellSense presents the newest technology in the field and would allow the optimization of the work of the plant operators from the start.
2. Plants under operation – this represents the largest share of the sales situations, approximately 90 %. The major challenge in this segment is convincing the users of the systems of the benefits, since an existing working culture can be difficult to change.
3. Plants in developed countries – the main sales argument for this segment is the improvement to work productivity and process efficiency, since plants in this segment are in constant pressure to minimize the costs.
4. Plants in China – the role of references is especially prominent in plants in China as plants are in constant competition with each other on investing in new technology. A high-profile reference can be the most important deciding factor for plants in China.

Research question 3: How could the key features of the value proposition be verified?

Table 1 lists the primary monetary benefits as a result of the improvements to a copper electrorefining process. The economic benefits are based on the three parameters of the OEE analysis. The environmental benefits are the result of a reduced carbon footprint by improved process efficiency. The economic value of the environmental benefits is based on the price of carbon emissions in the emissions trading system. The social benefits are the result of improved working conditions for the plant employees, resulting in reduced work absences. The data for the calculation is obtained from internal assessments at Outotec, since verified information from customers was not yet available.
### Value impacts

#### Economic value

<table>
<thead>
<tr>
<th></th>
<th>Improvement</th>
<th>Value (€)</th>
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<tbody>
<tr>
<td>Availability</td>
<td>0.20 %</td>
<td>57 028 €</td>
</tr>
<tr>
<td>Performance</td>
<td>2.64 %</td>
<td>757 208 €</td>
</tr>
<tr>
<td>Quality</td>
<td>1.00 %</td>
<td>204 000 €</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1 018 237 € / year</strong></td>
</tr>
</tbody>
</table>

#### Environmental and social value

<table>
<thead>
<tr>
<th></th>
<th>Value (€)</th>
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<tbody>
<tr>
<td>External costs decrease</td>
<td>55 427 € / year</td>
</tr>
<tr>
<td>Labour cost savings</td>
<td>7112 € / year</td>
</tr>
</tbody>
</table>

Table 1: Verification of the benefits using LCP and LCA

### Implications

The aim of this research was to develop a value proposition for CellSense, but it also gave insights on how to improve the value assessment process. The development process for the value proposition, pictured in Figure 1, can also be used as a basis framework for a more generic value assessment process. The key challenge in this project was obtaining accurate information relating to the realized benefits of CellSense. It is thus recommended that customer involvement is increased in the stages of the value assessment process. One way to increase the feedback from customers relating to realized benefits is including value verification services in addition to regular services that are included in the CellSense offering, such as maintenance and updating. This can confirm the value for current customers as well as providing references for use in future sales situations. Increasing the service element of the offering can also increase the responsibility that a technology supplier has for the development of the customer’s process, allowing for the recognition of new opportunities for improvement.