Experiences from Using the CORAS Methodology to Analyze a Web Application

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EXECUTIVE SUMMARY

During a field trial performed at the Norwegian telecom company NetCom from May 2003 to July 2003, a methodology for model-based risk analysis was assessed. The chosen methodology was the CORAS methodology (CORAS, 2000), which has been developed in a European research project carried out by 11 European companies and research institutes partly funded by the European Union. The risk analysis and assessment were carried out by the Norwegian research institute SINTEF in cooperation with NetCom. NetCom (www.netcom.no) is one of the main mobile phone network providers in Norway. Their ‘MinSide’ application offers their customers access to their personal account information via the Internet, enabling them to view and change the properties of their mobile phone subscription. ‘MinSide’ deals with a lot of sensitive customer information that needs to be secure, while at the same time being easily available to the customer in order for the service to remain usable and competitive. The goal of the analysis was to identify risks in relation to the use of the ‘MinSide’ application and, where possible, suggest treatments for these risks. This was achieved through two model-driven brainstorming sessions based on system documentation in the form of UML sequence diagrams and data flow diagrams.

Keywords: access control; authentication; case study; computer viruses; cost benefits analysis; cost estimation; data security; digital signature; encryption algorithm; hacker; Internet privacy; IS project teams; iterative design; passwords; risk management; security risk

ORGANIZATIONAL BACKGROUND

NetCom

NetCom is the second largest mobile phone network provider in Norway, providing solutions for mobile communication. NetCom is an innovative company that uses new technology and knowledge to meet its customers’ demands and aims to be a leading
company in Norway within the market of mobile communication. A main goal for NetCom is that their products shall be competitive on price and quality, while at the same time remaining easy to use and understand for all its customers. With offices in Trondheim, Bergen, Stavanger, Kristiansand and Tønsberg, and its main office located in Oslo, NetCom has 740 employees in Norway.

NetCom is owned by the Swedish-Finnish company TeliaSonera, the leading telecom company in the Nordic and the Baltic regions. Based on the number of customers, the company is the largest mobile provider in Sweden and Finland, the second largest in Norway (NetCom) and the fourth largest in Denmark. TeliaSonera is also the largest fixed voice and data provider in the region, with leading positions in Sweden and Finland. Furthermore, TeliaSonera is the largest operator in the Baltic region, with consolidated mobile and fixed line operations in Lithuania and consolidated mobile operations in Latvia. The TeliaSonera share is traded in Stockholm, Helsinki and on the NASDAQ Stock Market in the United States.

**SINTEF**

SINTEF is a Norwegian research institute with 1,700 employees. SINTEF performs research for the industry and the public sector in a number of different fields, ranging from oil and process industry to IT and medical research.

The group involved in this case study is the group for Quality and Security Technology (QST), which consists of seven people. This group was also strongly involved in the CORAS project during which the used methodology was developed. QST is part of SINTEF Information and Communication Technology (ICT) with about 300 employees.

### Table 1: NetCom’s Key Figures

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<thead>
<tr>
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<tbody>
<tr>
<td>Customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of customers</td>
<td>1,178,466</td>
<td>1,082,850</td>
<td>900,282</td>
<td>745,089</td>
<td>535,892</td>
</tr>
<tr>
<td>NetCom’s market share (of total amount of mobile phone customers)</td>
<td>29%</td>
<td>26%</td>
<td>28%</td>
<td>30%</td>
<td>30%</td>
</tr>
<tr>
<td>Total share of mobile subscriptions in Norway</td>
<td>86%</td>
<td>81%</td>
<td>75%</td>
<td>62%</td>
<td>48%</td>
</tr>
<tr>
<td>Finance</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Turnover/Sales (million NOK)</td>
<td>4,591</td>
<td>3,752</td>
<td>2,914</td>
<td>2,494</td>
<td>2,032</td>
</tr>
<tr>
<td>Result/Profit (million NOK)</td>
<td>670</td>
<td>547</td>
<td>425</td>
<td>364</td>
<td>296</td>
</tr>
<tr>
<td>Calling minutes per customer per month</td>
<td>1,101</td>
<td>725</td>
<td>421</td>
<td>331</td>
<td>103</td>
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<tr>
<td>Subscription</td>
<td>160</td>
<td>106</td>
<td>61</td>
<td>48</td>
<td>15</td>
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<tr>
<td>Prepaid</td>
<td>63</td>
<td>58</td>
<td>64</td>
<td>79</td>
<td>-</td>
</tr>
<tr>
<td>Text messages (SMS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total amount (in millions)</td>
<td>-</td>
<td>502</td>
<td>310</td>
<td>157</td>
<td>36</td>
</tr>
</tbody>
</table>

¹NOK Norwegian Kroner
²USD United States Dollars
³SMS Short Message Service

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