Development of interoperable systems for defence and civil security

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Saab market areas

Solutions

Commercial Aeronautics
CIVIL SECURITY
AIR
NAVAL
LAND

Products & Systems

Aeronautical Platforms
C4ISR systems
Support weapons & Light weight Missiles

Aeronautical Sub-systems
Civil security systems
Training and Simulation

Radar and EW-systems
Signature management
Underwater Systems

Services

Customer Support and Services
Saab in brief

- Sales 2011: MSEK 23,498
- Employees 2011: 13,068
- Established on 32 markets
- Sales to 100 markets
- 63% of sales outside Sweden
# Global Presence

## Employees 2011

<table>
<thead>
<tr>
<th>Country</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>10,321</td>
</tr>
<tr>
<td>South Africa</td>
<td>1,064</td>
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<tr>
<td>USA</td>
<td>652</td>
</tr>
<tr>
<td>Australia</td>
<td>324</td>
</tr>
<tr>
<td>UK</td>
<td>147</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>143</td>
</tr>
<tr>
<td>Finland</td>
<td>74</td>
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<tr>
<td>Denmark</td>
<td>68</td>
</tr>
<tr>
<td>Norway</td>
<td>55</td>
</tr>
<tr>
<td>Switzerland</td>
<td>46</td>
</tr>
<tr>
<td>India</td>
<td>44</td>
</tr>
<tr>
<td>Kenya</td>
<td>34</td>
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<tr>
<td>Germany</td>
<td>26</td>
</tr>
<tr>
<td>Other</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13,068</strong></td>
</tr>
</tbody>
</table>
Saab policies and goals

- It is a human right to feel **safe**

- It is Saab’s core business to help our customers to
  - identify **patterns**
  - **anticipate** tomorrow
  - **prevent** harm and **protect** societies
ENHANCING OPERATIONAL EFFECTIVENESS

LAND OPERATIONS SOLUTIONS

- Force Protection
- Collaborative Training
- Weapon Systems
- Integrated Support Solutions
SUPPORTING CAPABILITY GROWTH

NAVAL OPERATIONS SOLUTIONS

- Situational Awareness
- Decision Superiority
- Precision Engagement
- Communications
- Underwater Security
- Electronic Warfare
- Simulation & Training
- Infrastructure Security
SOLUTIONS FOR A SAFER AND MORE EFFICIENT SOCIETY

- Air Transportation and Airport Security
- Energy Production and Distribution Security
- Maritime Transportation and Port Security
- Prison Security
- Guard and Event Security
- Land Transport and Urban Security
- National Security and Infrastructure Protection
- Police and Rescue Solutions
- Field Facilities Solutions
- Border Security Solutions
SOLUTIONS FOR COMMERCIAL AIRCRAFT

- Aircraft Design and Manufacturing
- Aircraft Subsystem and Equipment
- Aircraft Support Solutions
- Engineering Services
- Regional Aircraft Sales & Leasing
- Air Traffic Management
Anticipate tomorrow

- Defence is likely to increase in importance as population growth, climate change, resource scarcity and instability, threaten the ability of countries to provide security for their populations.
- Many future efforts will be international and linked to globalisation, implying the need for major powers to operate globally and for alliances and partnerships that defend common interests.
- The environment is characterized by fast changes and more complex situations.
Geospatial Information in Saab Systems
Geospatial Information in Saab Systems

- A majority of Saab systems includes geographic information
- Central functionality
- Our customer needs geodata for
  - Situation Awareness
  - Infrastructure
  - Simulators for training
  - Organisation
  - Warning systems
  - In this system....and that
- It’s embedded
Geodata supply to the Gripen System
The geodata supply cycle

Producers
- GeoSE
- Lantmäteriet
- R3DM
- Eurocontrol
- OpenStreetMap

Collectors

Tools

Products
- Digital maps
- R3DM databases

Distribution

UPDATES

"Plan on the same map"
Interoperability requires...

- Many systems shall be able to read the same data at the same time
- Standards format and served distribution
Geospatial Information in Saab Systems

- AIXM
- City GML
- Open Flight
- WMS ...
- ARINC 424
- Saab format
- DGIWIG
- LAND
- AIR
- NAVAL
- COMMERCIAL AERONAUTICS
- CIVIL SECURITY
- ISO...
- S57
- CAD
- KML
- CDB
- Shape
GIS components with OGC services

- Server distributed data

**Geodata storage**
- Geodata (stored on file)
- Geodatabase

**Server services**
- Map engine (server)
- OGC

**User interface**
- Map visualizator (web)
- Map engine (thick client)
- Desktop GIS software
OGC presence in Saab system development

Validate and Publish by FAA

AIM

DATALINK

Web Page Service (AIXM)

Terminal Area Chart Data

Original NOTAMs at the Source

Web service (AIXM)

Federal NOTAM System

Validate and Publish by FAA
OGC WebService for distribution of data

OGC Services - WMS + WFS

HTML client

Mobile GIS

Map Server

Database

Vector + raster

OGC Services
Trends in IT and technology

- “Big data”
- High resolution
- 3D and 4D
- Data fusion – augmented reality
- Cloud sourcing
- Crowdsourced information
- Sensor network
- Intelligent systems
- Automated world – decision systems and manufacturing processes
- Mobile systems and applications
OGC areas of interest for Saab

- Security Management
- GML Schema Tools
- Architecture Profiles
- Bulk Data Transfer
- Cross-Community Interoperability
- Semantic standards
- GeoSMS
- Geo Mobile Apps
- Metadata
- Coverage Access
- GPS Messages
- Moving Objects in Motion Imagery
- AIXM and WXXM
- Digital NOTAM
- Geometry Processing
- Transmission to Aircraft
- Conceptual Mapping Tool
- Security
- CityGML

Urban Model of Berlin based on OGC CityGML
Source: [www.3d-stadtmodell-berlin.de](http://www.3d-stadtmodell-berlin.de)
The **Geodata Competence Center** is the company's central resource regarding **geodata and GIS competence**. It handles ordering and processing of geodata for all geodata consuming systems within Saab. GDCC also serves as a **hub for transfer of knowledge and technology** concerning **map data visualization** and **GIS-components** within Saab.
Development of interoperable systems for defence and civil security

- OGC is an important concept for Saab system development
- How can we cooperate better?
- What can Saab do for OGC?