Internet @appliances
An OSGI-based White Goods Smart Home Application

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Overview

- Who we are

- Starting Point

- Market and Customer requirements

- Features of the Product
BSH Bosch und Siemens Hausgeräte GmbH

2002

Companies > 100
Employees 35,200
Sales 6.09 billion €
Factories 40

Brands

SIEMENS
BOSCH
GAGGENAU
NEFF
Constructa
PITSOS
Thermador
Balay
Lynx
Superser
ufesa
COLDEX
Continental
A strong Position in the White Goods Market in 2001

Market volumes

BSH sales

Market leader
Germany

24.9 %

Market volumes

€ 7 bill.

BSH sales

€ 1.746 bill.

Market leader
Europe

16.3 %

Market volumes

€ 31 bill.

BSH sales

€ 5.067 bill.

Fourth-largest manufacturer of home appliances worldwide

5.5 %

Match volumes

€ 110 bill.

BSH sales

€ 6.092 bill.

BSH BOSCH UND SIEMENS HAUSGERÄTE GMBH
OSGi Worl Conference Sept 24-27 2002

BSH_OSGI_Congress_Sept02_Final_HW
The Starting Point

Business Challenge of Connected Appliances:

- Create an internet appliance business case
- Offer added value to customers
- Bring innovation into the white goods market
- Enhance customer relationship
- Increase BSH revenue
How do I connect my washing machine to the internet?

It is easy! You can read about it everywhere!

No, it is not!
- There are a lot of options and technologies!
- But no complete end-to-end solution!
"Indoor" vs. "Outdoor" Control

I wanna check and control my appliances from....

... just outdoor

... just indoor

... Outdoor and indoor control

The idea of remote controled appliances is...

... very interesting

... interesting

... less interesting

... uninteresting

BSH Study

Market Research
Which function is interesting for you in a smart home?

- Reduction of the temperature when leaving the home: 93.8%
- Security Check, when leaving the private home: 87.3%
- Remote Management of the Heating Units: 86.4%
- Simulation of being at home: 85.1%
- Service information from the appliances at home: 77.2%
- To pour our sward (grass) automatically: 61%
- Cooking Coffee automatic, Remote Starting: 49%
- Remote control of the stock in the fridge: 46.3%
- Remote control of the washing machine: 43.9%
- Filling our bathtub automatically: 35.4%

Source: Study BIS / Performed 2000
BSH focuses on appliance specific services
Solution Requirements and Design Goals

• Local and Remote access of appliances
• Low cost add-on for white good appliances
• Support for new devices
• Deal with resource constraints of appliances
• Flexibility for integration in in-house infrastructure
  – wireless protocol/No new wires
  – gateway platform
  – user clients
  – Plug-and-play installation
• Be prepared for integration into larger Smart Home solutions (being able to be expendable)
  – Consumer electronics
  – light control, security ....
• Open and flexible platform
Siemens Appliance Product Range

Same Product range for Bosch
Flexible Appliance Upgrade via Plug-in Module

Plug-in module providing internet-readiness

- Upgrade facility
- easy integration of other inhome communication standards

Internet-compatible domestic appliance
Price: Sales price + € 50

Benefits:
- Consumers can insert the system interface themselves if no specialist has been stipulated for liability reasons.
- Decoupling of appliance and standard
- Technical flexibility

System interface
Price: approx. € 79
BSH Embedded Residential Gateway and options

- Operating System: Linux
- Processor: Intel StrongArm, 206 MHz
- RAM: 64 MB; Flash 32 MB
- Designed for always on (stability, boot – up)
- Interfaces:
  - serial – EHS powerline module
  - WLAN
  - GSM/GPRS (on-board module)
  - USB and Ethernet

Gateway Platform Options

- PC Platform
- Dedicated Embedded Platform
- Future possibilities
  - Kitchen PC
  - Set Top Box, .....
Implementation of the BSH-solution

Software Layers

- Extended OSGI Services
- Core OSGI Service
- Utility Layer
- Presentation Layer
- Device Layer
- EHS Layer
- OSGI Framework
- Java VM
- Operating System
- HW Platform

BSH Application

3rd Party Apps
Requirements for the GUI and Clients

- Browser-based GUI: HTML / WML
- Dedicated (i.e. not Web) Look & Feel GUI
- GUI update via Push
- Functionality and Services
  - Device Status
  - Device Control
  - Configuration of User Specific Services (Message Configuration, ..)
  - Multi User
  - Online Help
  - Additional Services
  - User Management
Client Variants

- Portable Devices: Webpad/SIMpad, Pocket PC (Loox)
- Permanently mounted control panel: Loewe TV-Set or PC

Benefits of a TV-Set:
- All in one:
  - Internet-access,
  - Home-control &
  - TV-Set
- Central Element in every home

Benefits of SIMpad:
- All in one:
  - Internet-access &
  - Home-control
- Mobile in the Home
- Quickly connected

PC as Control and Multimedia Terminal
- high penetration in private homes
- open issues concerning security and stability
- where is the best place to place, kitchen, living room

But it is also possible to manage the appliances just with the mobile Phone
GUI ScreenShot: Overview Page

- **Hood**
  - Extraction time
  - Fan speed 2

- **Dishwasher**
  - Auto wash

- **Fridge-freezer**
  - Freezing compartment -21 °C
  - Cool compartment 5 °C

- **Hob**
  - Active: + - +
  - On

- **Washing machine**
  - Temperature -25 °C
  - Super freezing

- **Oven**
  - Top/bottom heating

- **Freezer**
  - Temperature -25 °C

- **Mobile air-conditioning unit**
  - Maximum cooling
  - Target Temperature 18 °C

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System  Service  Overview
The user interface as customer interface

- Different conceptions of interacting with the appliances are evaluated
- The optimal User-Interface for the dedicated client is choosed
- The optimal User-Interfaces depends on:
  - different customer requirements in different situations (control, messaging)
  - performance and resources of the Client (resolution, colours, performance)
  - place of usage (indoor, outdoor, kitchen, living room)
Services

The first product generation starts with basic services

• Device Control from indoor and outdoor

• Device Status/indoor and outdoor Messaging

• Configuration of User Specific Services

• Online Help

• Remote diagnostics

• Additional Services are under development
GUI ScreenShot: Online-Help, Hints, and...
Sharing the technology with partners

BSH is open for providing licenses to part of their I@-technology

- KNX
- Powerline Plug&Play Technology
- Plug-In Module as retrofit solution
- OSGi-based Software solutions
- GUI-Design for white goods appliances and others

BSH is also interested in cooperating with partners from other industries (Service Providers, Automotive Industry, Entertainment Industry)
Timeline for BSH smart@Home

- Q4 / 2002 – BSH internet-ready appliances are available for consumers
- Q1 / 2003 – BSH Field Trial with Customers (OSGi gateway, Appliances, Services)
- Q2 / 2003 – Appliance dealers showcase BSH solution
- Q2,3 / 2003 – BSH smart@Home solution available for consumers
BSH smart@home and Partners

BSH smart@home Program:

- Definition of market- and customer requirements
- Definition and development of a complete system and services
- 25 different types of appliances are adapted (development, qualification and production)
- Activities of marketing, sales and distribution
- Management of Product divisions in over Europe and partners (8 BSH locations, 6 partners)

Development Partners

Siemens
Siemens Business Services
Siemens PSE, Austria
Siemens Corporate Technology

BSH Sites

- Headquarters
- Cooking
- Refrigeration / Freezing
- Dishwashing
- Washing / Drying
- Consumer Products
- BSH Divisions participating at smart@home project
- External Partners: Siemens PSE, SBS, Prosyst, W3D, Sipro
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