Fraunhofer in Germany

- 66 Institutes for Applied Research
- More than 22,000 employees
- Budget: 2 billion Euro

- Institutes work as “profit centers” and are linked to local universities
- min 1/3 of the budget from industrial projects
- Spinoffs by Fraunhofer researchers are encouraged

www.fraunhofer.de
INFORMATION SESSION

- Demand-side drivers
  - Demand mapping
  - Technology forecasting

- Supply-side capabilities
  - Strategic AT relationships
  - AT Competencies
Demand-side drivers

• Key statements related to **demand mapping**
  – There is an increase of elderly people in need of care.
  – Home care increases.
  – More and more elderly people live in single-person households.

• Relevant areas for **technology forecasting**
  – Health(care)
  – Safety
  – Household and supply
  – Social inclusion
Home care costs and benefits
Market development

Age distribution and population development Germany – increase of elderly people by ~10% until 2050

<table>
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<th>Year</th>
<th>in total</th>
<th>under 20</th>
<th>20-65</th>
<th>65 and older</th>
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Sources: FAZIT Studie – Georgieff (left), statistisches Bundesamt (right)
Facts in Germany:

- 2030 ~3.4 Mio people will be care-dependent in Germany (2009 ~ 2,8 Mio)
- Today ~70% of all care-dependent persons live at home
- Number of single-person households is increasing

Source: statistisches Bundesamt
Demand-side drivers
Technology forecasting: Application areas for AT

1. Health(care)
Prevention, treatment, rehabilitation and nursing such as
Stationary and ambulant medical information systems, telemonitoring, telemedicine and home care, domestic emergency call and activity check, personalised health systems and services from various medical areas, eHealth, information networks and electronic patient files.

2. Safety
Alarm, locking and monitoring systems such as
Cross-linked smoke and gas detectors, cross-linked burglar alarm, simulation of presence and absence with central control of shutter and light, heating, hot water and ventilation, central locking system for apartment/house, video based intercom system, control over house via Internet-based webcam.

3. Household and supply
Building automation, cleaning and delivery services such as
automated distant reading and billing, robotics (vacuum cleaner, etc.), programmable switches, cross-linked entertainment electronics, tele-diagnosis of housing technology, Smart Metering – control of energy consumption and display on terminal / PC / TV.

4. Social inclusion
Communication networks, recreational activities and mobility such as
enabling „triple-play“ in apartments by connections for TV, radio, telephone and Internet, use of Internet service platforms as neighbourhood bulletin boards, supply of services via service centres or concierge.

Sources: based on VDE
Demand-side drivers
Technology forecasting: Care-O-bot® (Fraunhofer)

- Mobile robot assistant that actively supports in domestic environments
- Individual, application specific product design, programming or rental
- Application scenarios
  - Transportation of desired objects; orders are placed via smartphone or the robot’s touch screen
  - Video telephony, game board, reminder function
  - Automatic setup of communication with an emergency center (emergency support)

Video: www.youtube.com/watch?feature=player_embedded&v=ABpOtvLzh2U

Demand-side drivers
Technology forecasting: Care-O-bot® (Fraunhofer)

1. Health(care)
2. Safety
3. Household and supply
4. Social inclusion

Sensor Head
- Stereo camera
- 3D sensor
- 1 DOF to flip sensors back and forth

Manipulator
- 7 DOF, redundant
- TCP and joint control
- Hollow shaft for cables

Gripper
- 7 DOF, 3 fingers
- In-finger tactile sensors

Basis
- 4 DOF kinematic for body expressivity
- Stereo speakers
- 3 control PCs

Tray
- 1 DOF
- Touch screen

Omnidirectional Platform
- 4 wheeled omnidirectional drive system
- 3 laser scanners
- Li-ion or lead-acid battery

• Single seniors often lie on the floor several hours after a fall, before their accident is discovered. They cannot always trigger a domestic emergency device – because they are not wearing the device, are unconscious, or injured.

• A current research project Fraunhofer is involved in aims at developing a optical and acoustic sensor system that detects and reacts to emergency situations

• Sensors boxes installed on the ceiling register when a person needs assistance and notify the alarm unit in the home, which immediately calls for help – by telephone, cell phone, or internet.
User interfaces for AAL environments (TV, touchscreen, Avatar, audio interface)

Interfaces are necessary that are modular and adaptable (temporarily) depending on the current situation (e.g. progress of disease, health situation, ...)

- Information (contact, calendar)
- Reminder (medication, nutrition especially drinking)
- Building and appliance surveillance (status of house)

Source: Fraunhofer IAO
Demand-side drivers

Technology forecasting: Fraunhofer inHaus

Intelligent environments for elderly people

1. Interactive Mirror
2. Adjustable in height
3. Medicine suspensor
4. Touchless water tab
5. Soap dispenser
6. Toilet with shower functionality
7. Toothbrush

Source: Fraunhofer IMS