



An Investigation on Acceptance of Ubiquitous Devices for the Elderly in an Geriatric Hospital Environment: using the Example of Person Tracking

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Overview about this study

- In this study, we examined the (expected) benefit of surveillance of people suffering on dementia in order to prevent wandering by application of RFID-tags and WLAN.
- We used specifically developed questionnaires and guided interviews and investigated the opinions, attitudes and beliefs of the affected individuals
- N=25 persons (physicians, nursing staff, managers, therapists, social workers) were interviewed in their familiar environment
- The questionnaire covered three primary data areas: patients, relationships, institution (similar to the model of Bronfenbrenner (1977))

Motivation for Research

- In 2006, 5.4 million citizens – alone in the European Union – are living with dementia (inclusive Alzheimer disease),
- researchers predict an incredible increase (10 M by 2030)
- most of these include elderly people
- Dementia is a progressive decline in cognitive functions, which directly affects (ICD-10 F00-F99):
 - Memory
 - Attention
 - Orientation and location
 - Thinking, Decision Making, Problem Solving
 - Comprehension
 - Learning performance
 - Language capabilities
 - Judgment
 - etc. etc.

The prevalence of dementia is dependent from age

Prävalenz von Demenzen in Abhängigkeit vom Alter

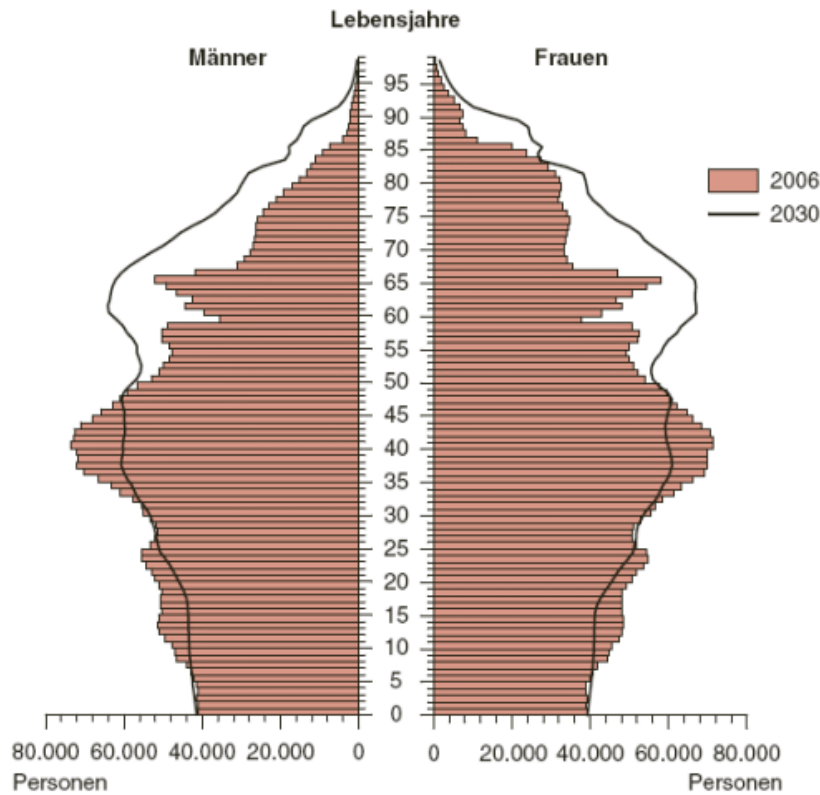
Altersgruppe	Mittlere Prävalenzrate (%)	Geschätzte Krankenzahl nach Altersstruktur im Jahr 2004
65-69	1,2	62.000
70-74	2,8	101.000
75-79	6,0	180.000
80-84	13,3	285.000
85-89	23,9	190.000
90 und älter	34,6	215.000
65 und älter	7,2	1.033.000

Dementia is dangerous!

- People suffering from dementia have no ability to perform even simple daily activities (Activities of daily living - ADL) due to the lack of remembering the proper sequence of events and on how to use the required tools, and most of all, they can bring themselves into dangerous situations [12].
- Consequently, technology to assist people with dementia is highly necessary and much is available today.
- Lawson (2001) was one of the few, who took not only technology for people with dementia into consideration, but developed dimensions of quality of life, taking into account aspects of autonomy, privacy, dignity, spiritual well-being, functional competence, comfort, security, individuality and enjoyment [13].

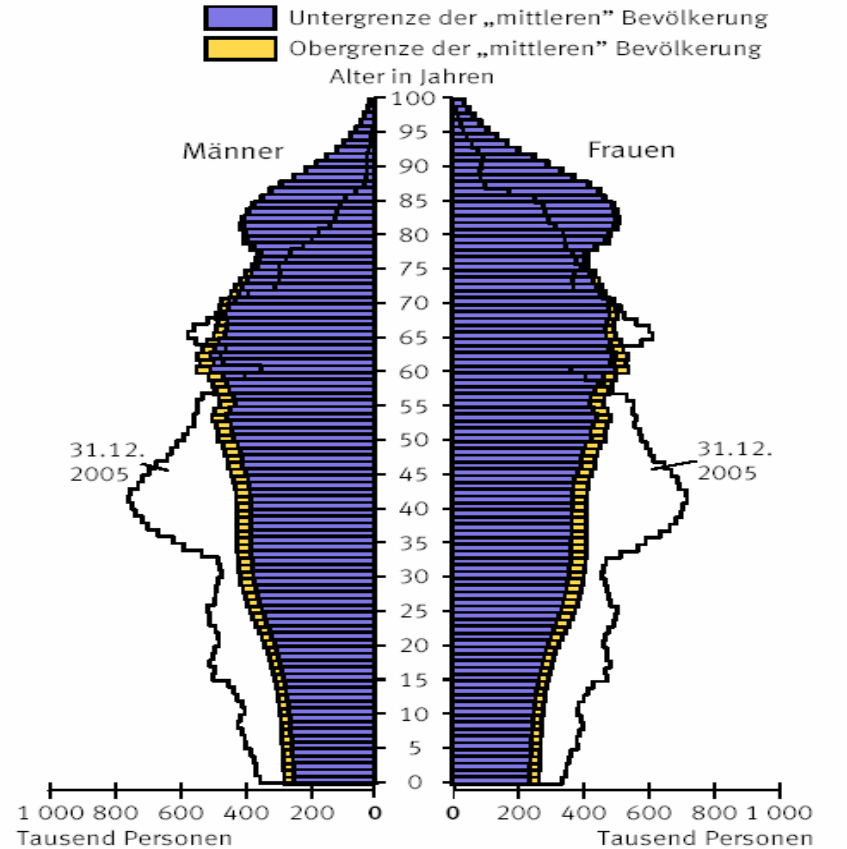
Population pyramid (Austria & Germany)

Bevölkerungspyramide für Österreich 2006 und 2030



Q: STATISTIK AUSTRIA. Erstellt am: 05.11.2007.

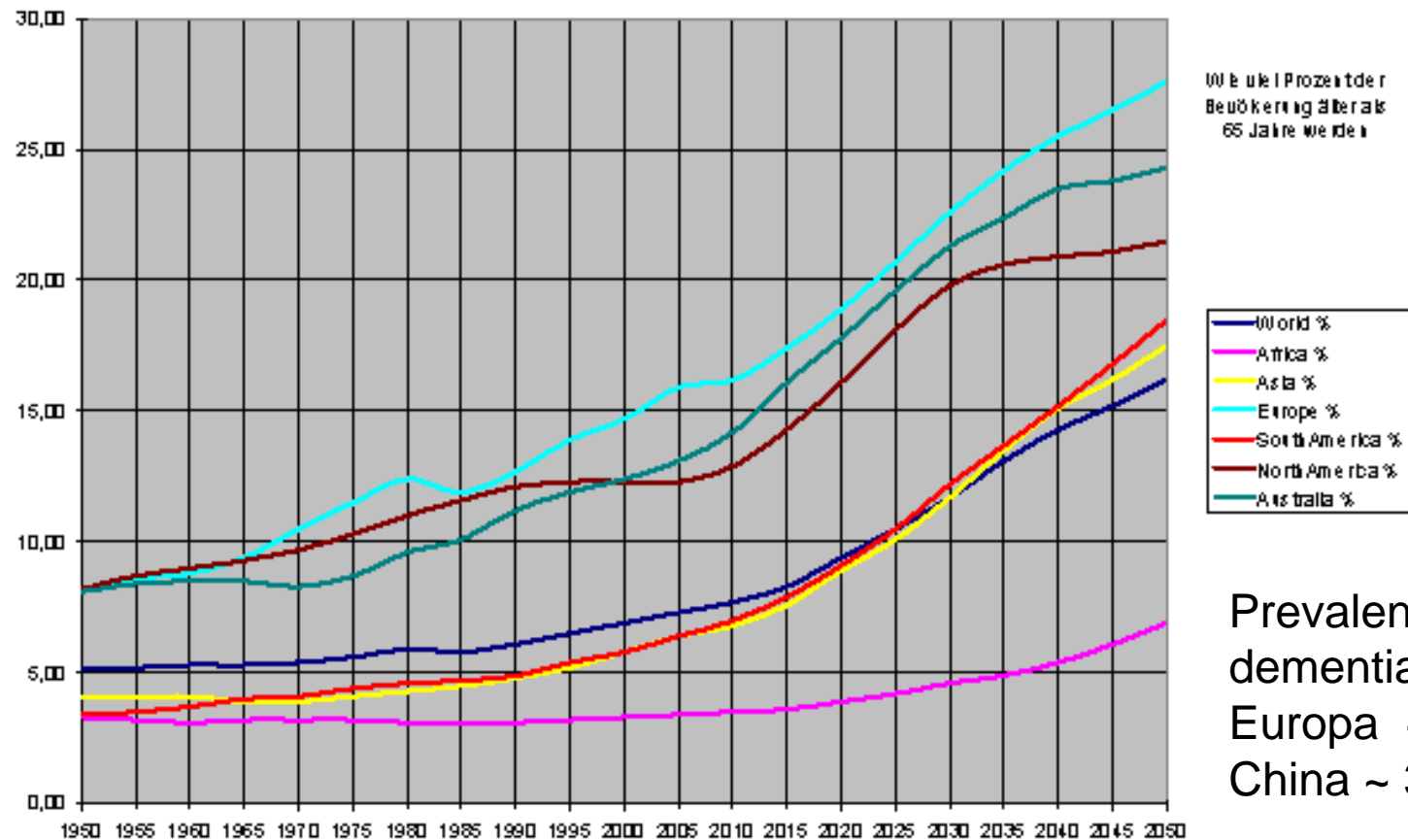
am 31.12.2005 und am 31.12.2050



Statistisches Bundesamt 2006 - 15 - 1302

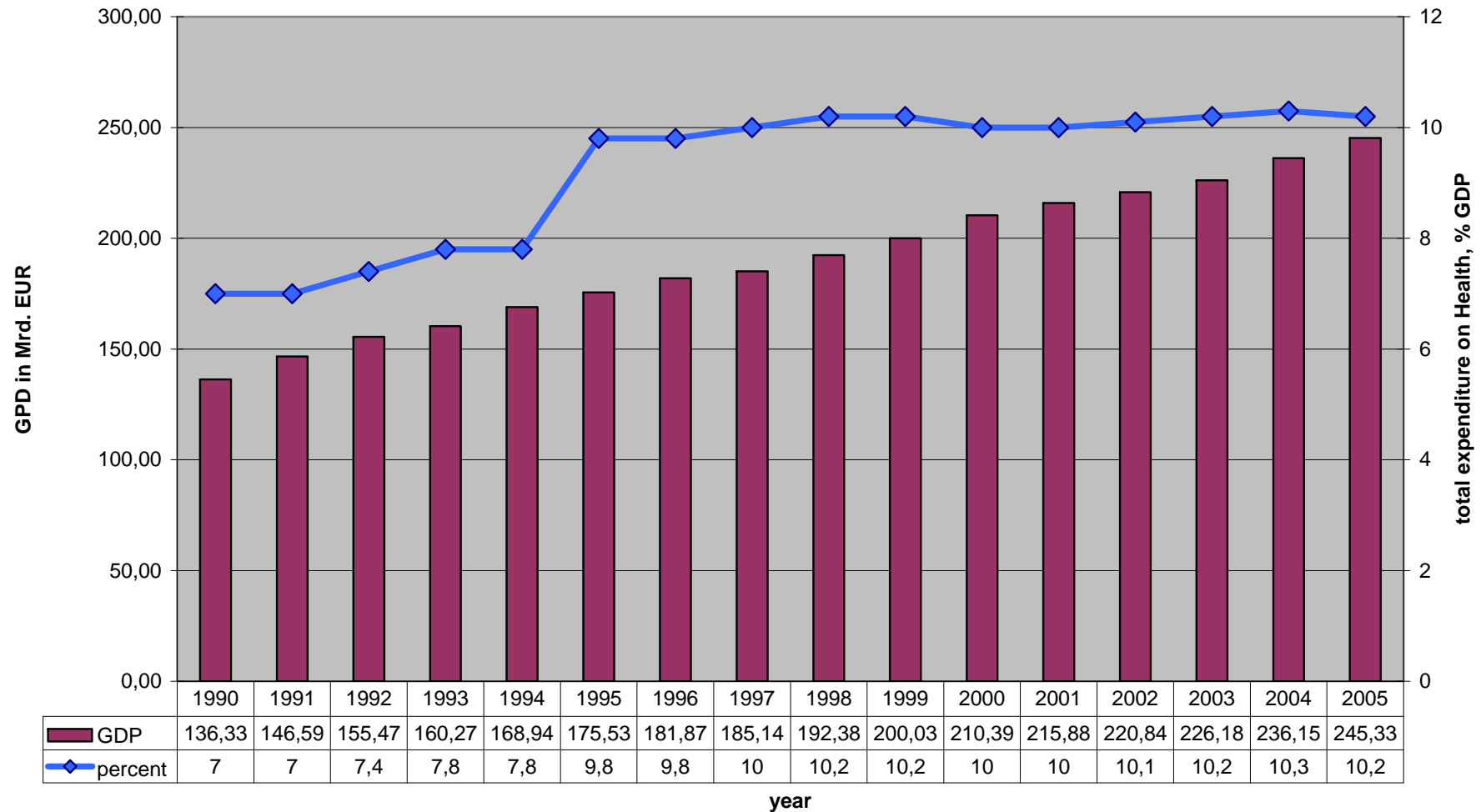
Even more dramatic: World population

■ Percentage of persons 65 years and older in 2050



Prevalence of dementia in 2050
Europa ~ 18,3 Mio
China ~ 33,3 Mio

Health expenditure in Austria



Safety for geriatric patients



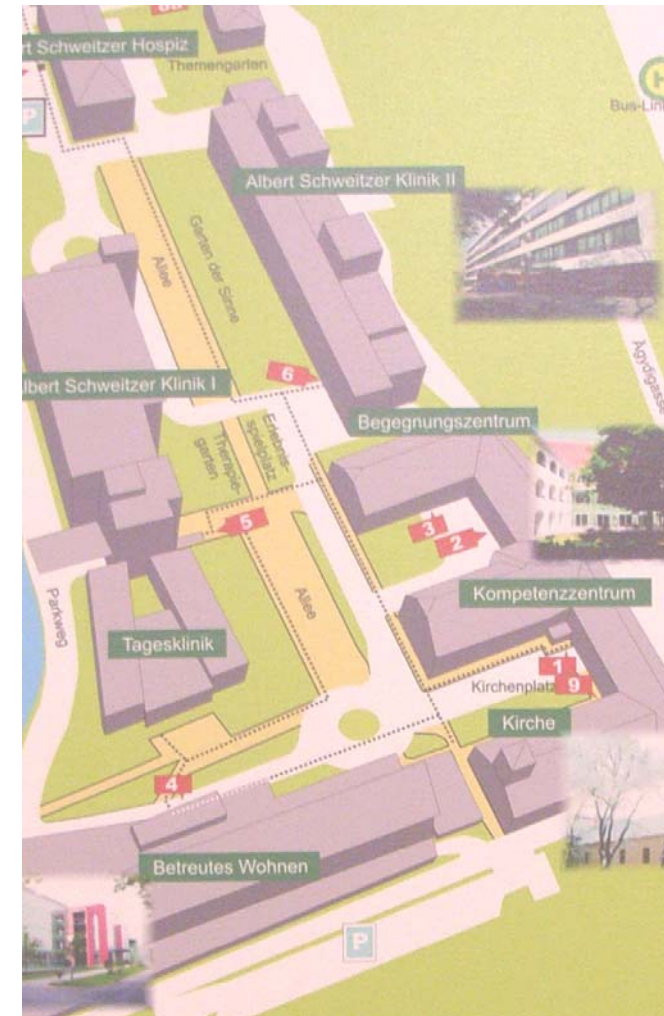
- New technologies have been developed to promote safe mobility of geriatric patients and to eliminate or alleviate adverse events
 - patient falls
 - bedrail entrapment
 - patient wandering

- The Structured Interview Model was selected for the empirical investigation since the range of topics was clearly outlined [14], [15].
- Since different approaches to this theme were available to the interviewers (technical training versus commercial training), specifically the Tandem Interview Model was applied [16].
- The question catalogue was arranged as follows: introduction and background of the questionnaire; objective of the survey; duration of the interview; questionnaire; The actual questionnaire covered three prime data areas; institution; patients; relations;
- On the basis of this questionnaire, N=25 people from the fields of management, hospital services, physicians, nursing staff and social work were interviewed in their familiar environment [17].

Experimental Environment

■ The "Albert Schweitzer Klinik"

- Part of the Geriatric Health Center Graz (Geriatrische Gesundheitszentren, GGZ)
- "Memory Clinic" with 22 beds and an attendant "garden of the senses"
- "Geriatric Medicine" with 120 beds
- "day clinic", an "acute-geriatric" and "remobilization clinic", a coma vigil station – "Apallic Care Unit", and the "Albert Schweitzer Hospice"



Technical Solution

- Communication solution based on IP-technology
- Company Kapsch provided the GGZ with a communication solution based on IP-technology
- Complete area (incl. external areas) equipped with Cisco WLAN (170 APs on 5 WLAN-controllers)
- Managed with Cisco wireless-LAN control (WCS)
- Failover – in case of failure, surrounding APs can supply this sector
- Cisco Call-Manager-Cluster for approx. 500 IP-Phones
- Full redundancy

Technological Solution



- Localization of disoriented Persons (I)
- Based on the WLAN-infrastructure the "Deso"-solution of Kapsch was implemented
- The components employed were:
 - Cisco Location Appliance
 - Kapsch Alarmserver
 - Kapsch AeroScout Service & User Interface
 - AeroScout Exiter
 - AeroScout TAGs

Technological Solution

- Localization of disoriented Persons (II)
- Cisco localization appliance based on WCS enables omni-directional and full-coverage localization (accuracy of 5 to 10 meters is possible)
- Additional AeroScout Exiters are affixed on all exits (gives alarm when a patient leaves the area)
- The tags communicate in programmable, intermittent intervals with the WLAN-infrastructure
- Disoriented persons are “assigned” to areas, in which they can move about freely

■ "Ethics is the boundless extension of responsibility towards everything that lives" (Albert Schweitzer)

- This quotation from DDr. Albert Schweitzer is placed in the forefront of the GGZ's mission statement. All actions, and everything done by the people interviewed, are in the mission statement of the GGZ: "Meet Life with a Smile". The patients are cared for according to the "Psychobiography Health Care Model" of Erwin Boehm. In the foreground, there is always: what is necessary for the patient. Therefore, quality of life, security and protection rank in the highest places.

Discussion


- The results of the interviews showed clearly:
- The people being cared for must come first, and only as much technology as can be absolutely medically, moral and ethically justified, may be used.
- These results are in line with the mission statement. It is interesting that, while the employees concerned considered the tracking of persons suffering from dementia a necessity, they reacted negatively to the idea of surveillance.

- Heimaufenthaltsgesetz (Home Residence Act) of 2004
 - § 3 (1): monitoring is considered as an infringement of liberty. This is demonstrated "when a patient or person being cared for is physically prevented, against their will or without their permission, from changing their location, in particular by mechanical, electronic or medicinal measures, or by the threat thereof"

- Surveillance by means of AeroScout is therefore, in the legal sense, an infringement of liberty and must therefore be regarded as extremely sensitive

Conclusions

- In order to prepare the elder population to live longer in their preferred environment, we must first introduce technology, not to any particular device but to the concept of modern engineering.
- They must be willing to judge innovations on their merits rather than rejecting them out of hand.
- This awareness and acceptance can be fostered and increased by education and example.
- Industry must be cognizant of the fact that **awareness** training must go hand-in-hand with good design and that knowledge of the end user equally important as functionality ...

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- Much further work is needed to enhance quality of the development for the Elderly, especially for those suffering from dementia ...



Let us together make Software & Systems usable and accessible for all

Thank you!





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