

# Japanese State of the Art and Perspective on ADI



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Sciences



# Background

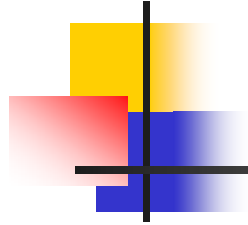
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- High rate of aged society
  - Long-term care insurance(2000)
- Delay of economical growth
  - Topics of Important Research Sciences
    - Information technology
    - Life Science
    - Nanotechnology and material
    - Environment

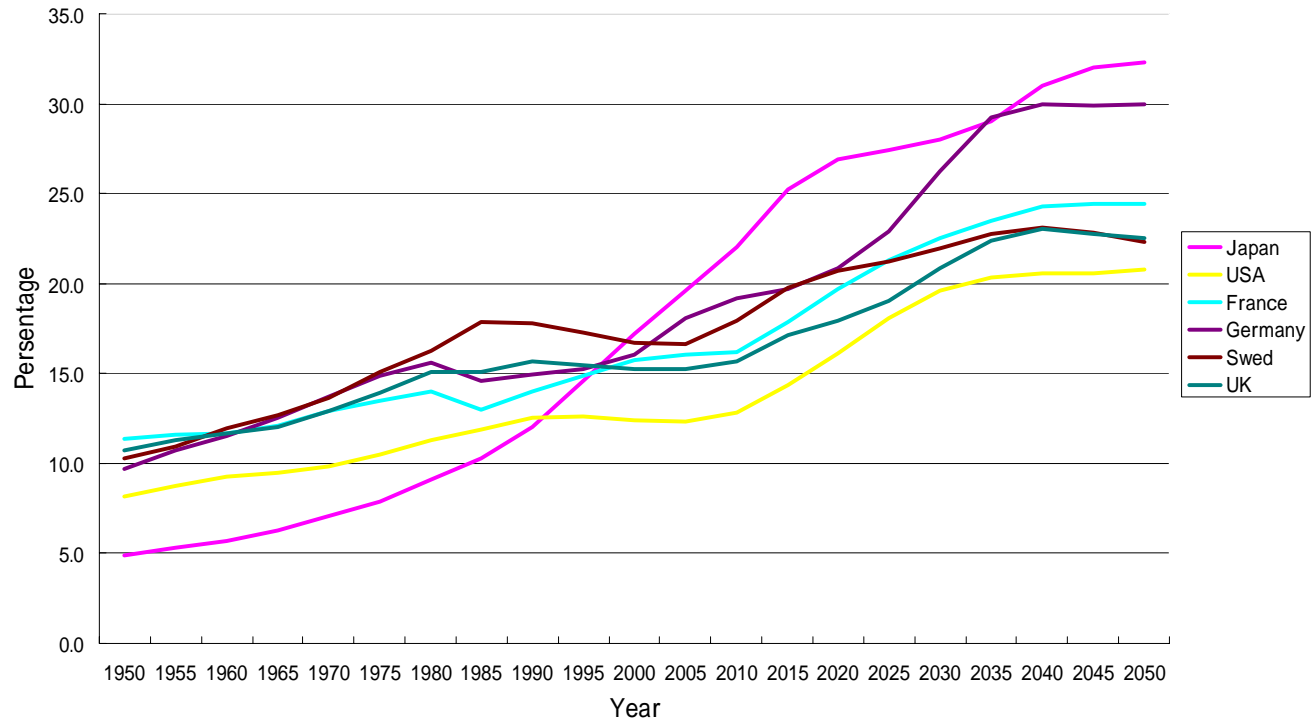


# Aged Society

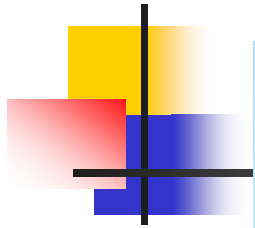
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## Elderly rate







# National Institute for Longevity Sciences

**Department of Basic Gerontology**

**Department of Molecular Genetic Reserch**

**Department of Epidemiology**

**Department of Dementia Research**

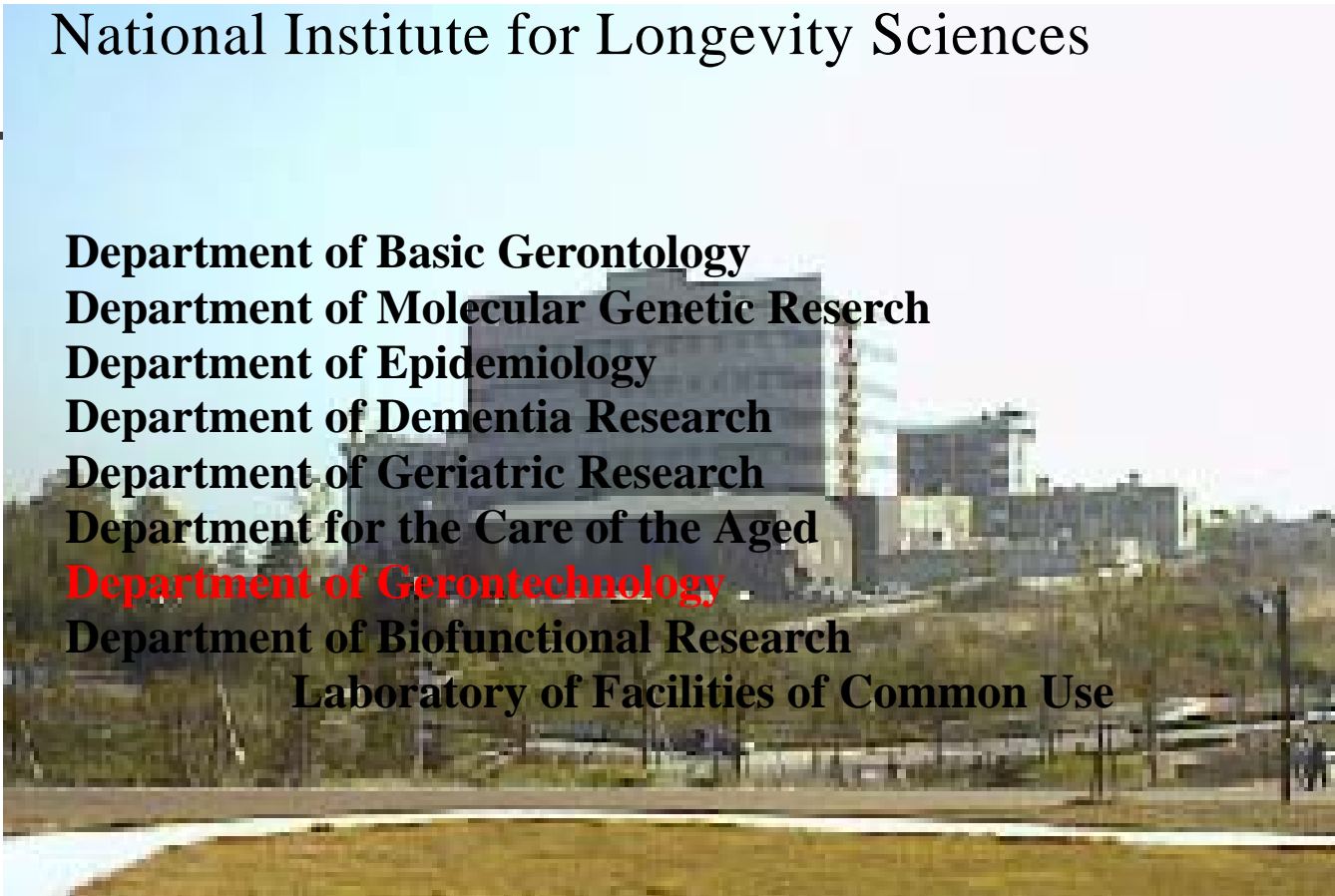
**Department of Geriatric Research**

**Department for the Care of the Aged**

**Department of Gerontechnology**

**Department of Biofunctional Research**

**Laboratory of Facilities of Common Use**





# New Era of Institution

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- National center of geriatrics and gerontology will be reorganized on March 1<sup>st</sup>, 2004
- 13 departments and 5 facilities



# National Center of Geriatrics & Gerontology

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- Experimental Gerontology
- Molecular genetics and aging
- Brain science and functional imaging
- Alzheimer's Disease Research
- Vascular Dementia
- Bone and Joint
- Regeneration and Reconstruction Biology
- Epidemiology
- Geriatric Medicine
- Oral Disease
- Function for Activation
- Gerontechnology
- Policy Science
- Laboratory Aging Animal Research
- Experimental Animal Research
- Radiation Safety
- Molecular Genomics and Proteomics
- Research Resource





# Information technology

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# e-Japan strategy

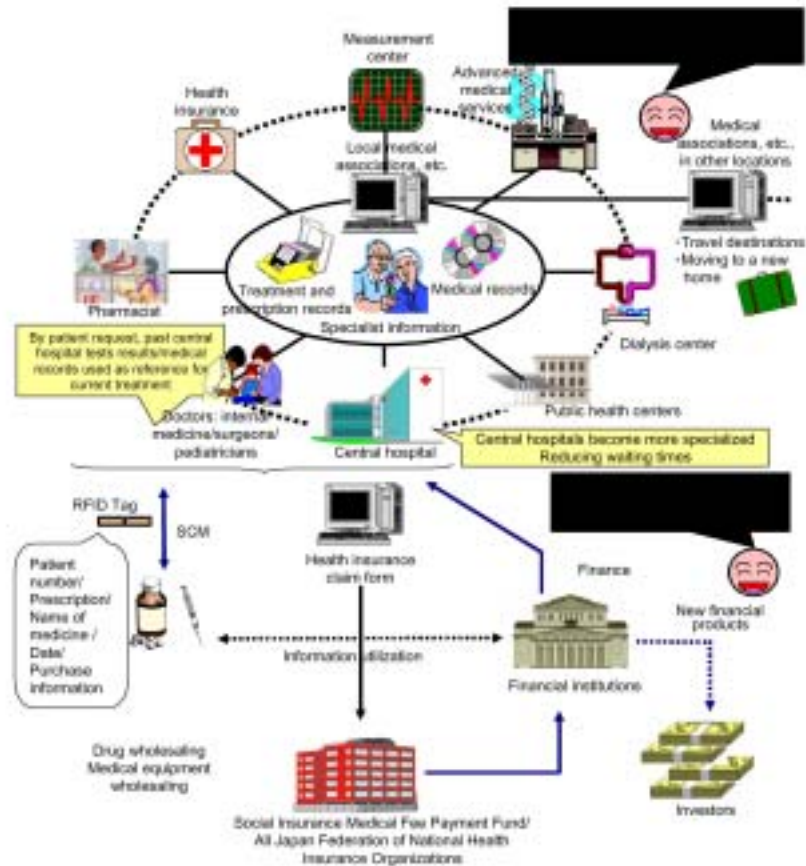
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- Through the strategic utilization of IT, the aim is to realize an energetic, worry-free, exciting and more convenient society



# 1. Medical Services

Medical institutions work together to offer patient-centered service.  
 Health care is improved by inexpensive, safe and worry-free medical services.





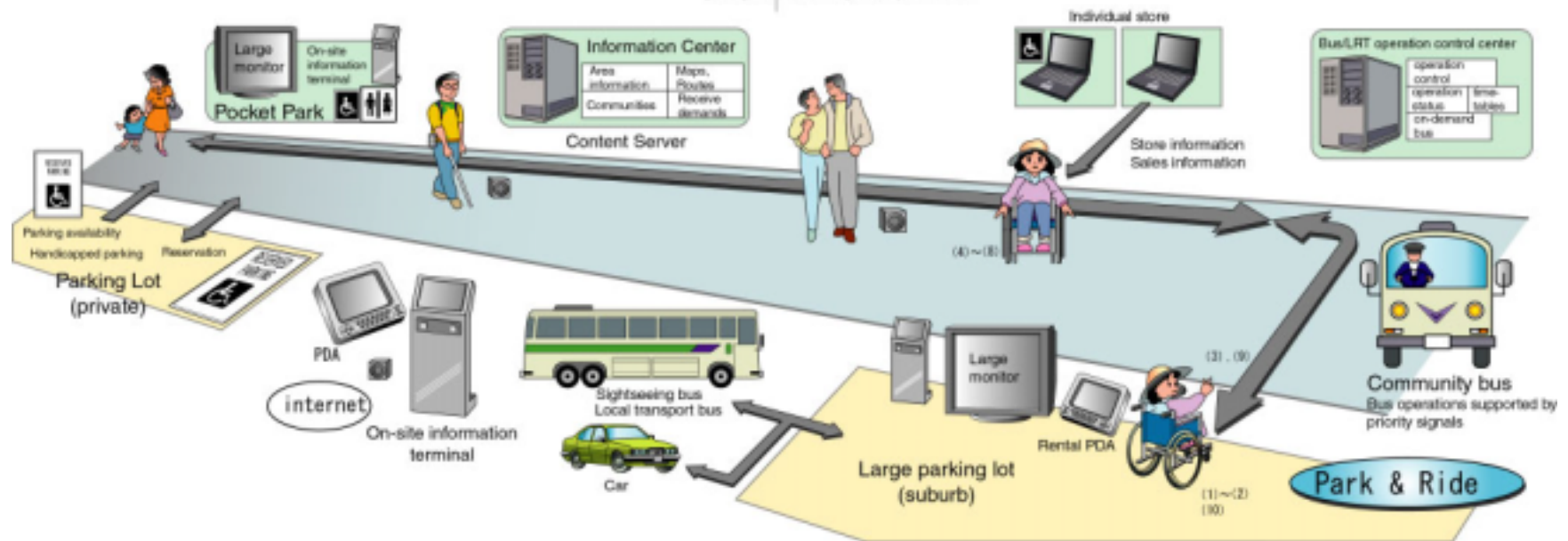
## Project in 2004 (METI, MHLW)

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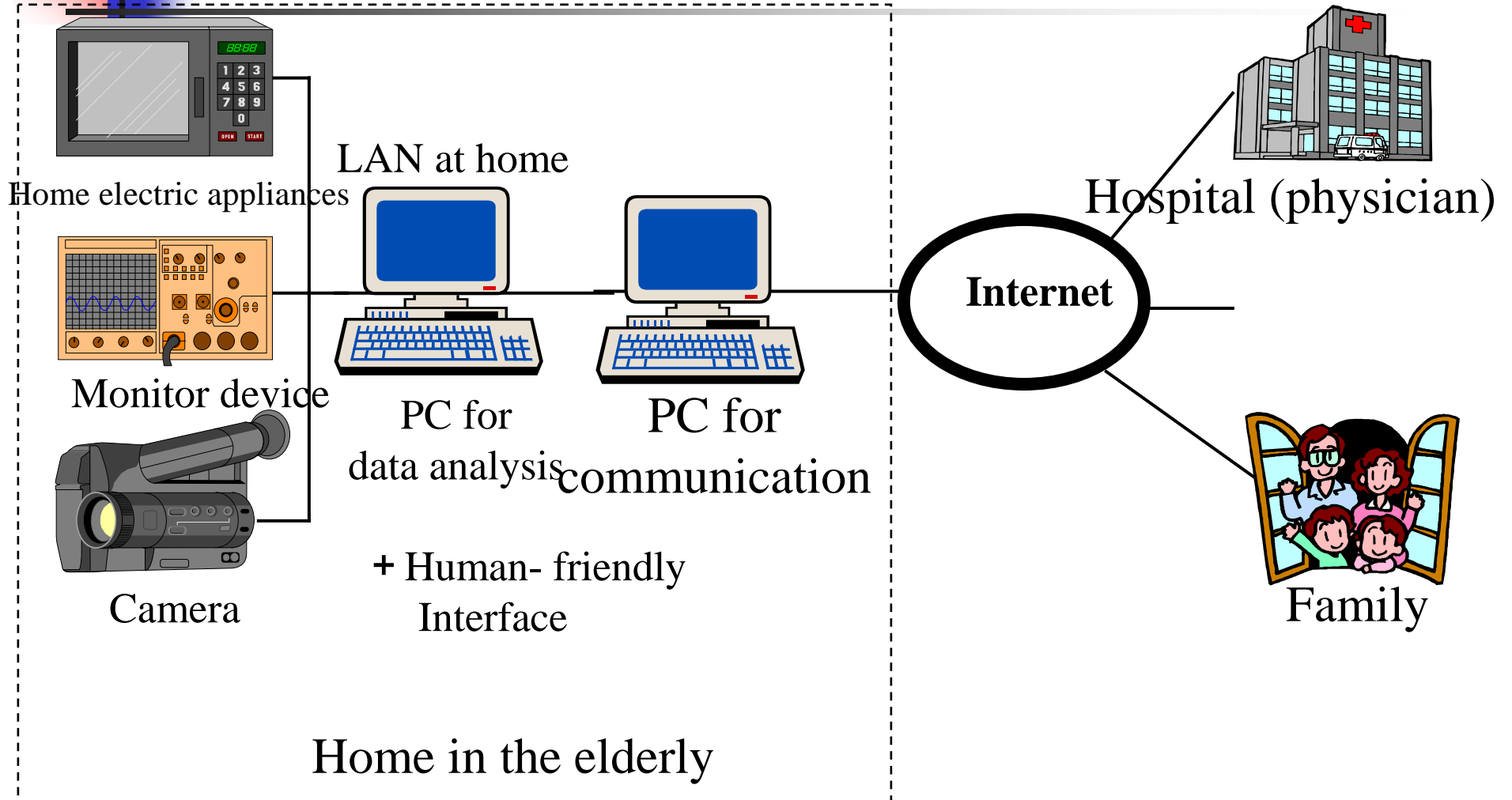
- ITS barrierfree
- Health promoting system
- Nano-medicine

# Intelligent transportation system and barrierfree environment for elderly and disabled persons

Below: Conceptual image of the Pedestrian ITS (an intelligent transport system) ITS has been realized by the development of information technologies such as Personal Digital Assistants (PDA), the Global Positioning System (GPS) and the Geographical Information System (GIS). It provides a walking environment in which all pedestrians, including the elderly and the disabled, can enjoy smooth and comfortable mobility. Pedestrian ITS offers three main functions: "positioning" to tell the user where he/she is now at any time, "route guidance" to allow the user to search for a destination so that the system can guide him/her according to the displayed route and "traffic and area information" to provide information on real-time bus operations and taxi waiting times, as well as on events and shopping. All such information is accessible in no time from a PDA so that pedestrians can avoid crowded areas and reach their destination easily without getting lost even along a complex course.



# Network system we proposed





# The plan of government

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- Acceleration of research and development projects
- Subsidies for new business development
- Procurement of additional equipment for the International Trade and Industry Inspection Institute



# Smart House Project

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- Home Health Care
  - Heart rate, Body movement, Body weight, Urinary volume
- Real-time sensing using physical sensors
  - Movement inside the house
  - frequency of Open/Close the refrigerator





# The plan of government

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## Aim of this project

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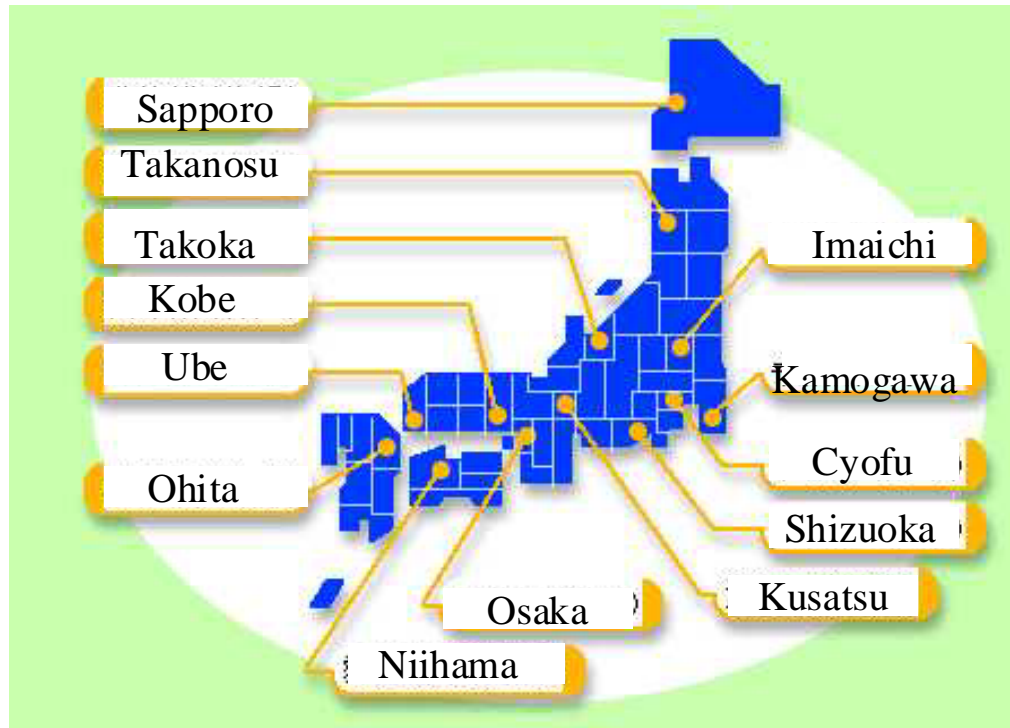
The aim of this project was to develop a health monitoring system for elderly and disabled people using **fully automated signal processing** from within the home. This monitoring system was designed to not interfere with sleeping, bathing or elimination



# Design

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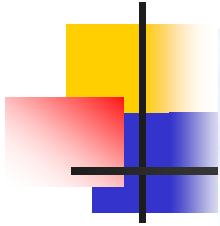
The health monitoring system consisted of monitoring devices and a computer terminal for data collection. The data were automatically collected from monitoring devices placed in the bed, bath, and toilet, transferred to a data terminal in the bedroom, and stored for further analysis. Thus, the subject and caregiver did not operate any system. The system monitored electrocardiogram (ECG) signals from the bed and bath, and body weight measurements taken from the toilet.



Welfare Techno-Houses in Japan

1993-2003

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Overview of Welfare techno house Mizusawa



Living room -barrier-free design



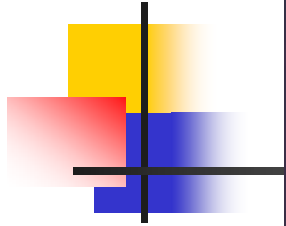
Bedroom (electro-conductive sheets are attached on the bed)



## Bathroom

The ECG is measured through tap water.





## Kitchen

Power and water consumptions are monitored by sensors.



Sanitary room

The Body weight and excretion volume can be monitored by toilet..

# Application





# Health promoting system for longevity society

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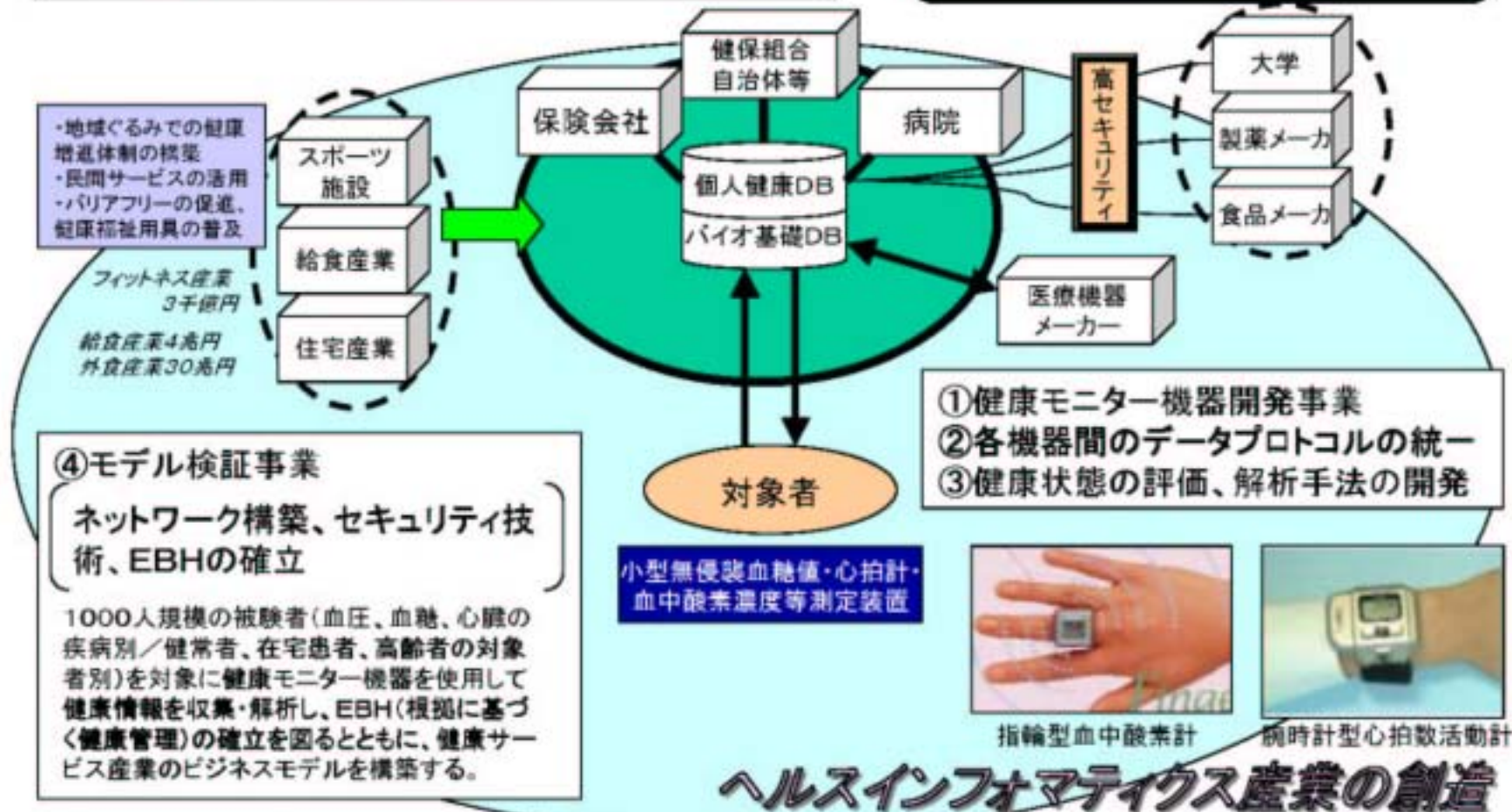
- Digital electric appliance
- ECHONET
  - a standard, general-purpose system
- Automated data collection
- Data mining

# ホームヘルスケアモデル事業

新規事業

- 携帯端末等を利用して、家庭や個人で健康をモニターし、地域・職域ぐるみで生活習慣病を予防。
- 食事のコントロールが必要な人には栄養を考えた食事をデリバリーしたり、最寄りのコンビニに食材キットをテイクアウトで作成。等

- 病院に行く人を減らし、医療費を削減。
- 労働力人口を拡大。
- 健康情報管理サービス、モニター端末ソフト開発等に係る新規産業の創造。





# To be solved

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- Cost
  - Who pay ?
- Human interface
- Maintenance free
  - Automatic device
  - No PC for telemedicine
- Regulation and health insurance