Robotics technology for the Japanese elderly care markets:

What consumers want robotics technology to deliver for the elderly
Robotics technology for the Japanese elderly care markets

1. Elderly population and care providers
2. Attitude toward robots and robotics technology (from market research)
3. Relevant RT solutions developed or under development
4. Social demands, and market needs (from various case studies and academic research)
5. What is needed (from care provider interviews)
1. Elderly population and care providers

1-1 Life Expectancy (LE) and Healthy Life Expectancy (HLE) increased at least until 1995 over one generation time.
主要先進国における平均寿命の推移

資料）厚生労働省「完全生命表」「簡易生命表」（日本とそれ以外の2007〜09年データ）
VDI Online 2008.7.31、社会保障人口問題研究所「人口統計集2005」（1959年以前）
1. Elderly population and care providers

1-2 Life Expectancy (LE) gains after 1995 were mostly in years of poor health (expansion of morbidity after 1995 among the Japanese, with the exception of women over 85)
1. Elderly population and care providers

1-3 Significant change in family structure:
More elderly people live by themselves as elderly couples or alone.
Households with 65+

<table>
<thead>
<tr>
<th>Year</th>
<th>Alone</th>
<th>Couples</th>
<th>With single child</th>
<th>3 Gen.</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>1986</td>
<td>13.1%</td>
<td>18.2%</td>
<td>11.1%</td>
<td>44.8%</td>
<td>12.7%</td>
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<tr>
<td>1989</td>
<td>14.8%</td>
<td>20.9%</td>
<td>11.7%</td>
<td>40.7%</td>
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<tr>
<td>1992</td>
<td>15.7%</td>
<td>22.8%</td>
<td>12.1%</td>
<td>36.6%</td>
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<td>1995</td>
<td>17.3%</td>
<td>24.2%</td>
<td>12.9%</td>
<td>33.3%</td>
<td>12.2%</td>
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<tr>
<td>1998</td>
<td>18.4%</td>
<td>26.7%</td>
<td>13.7%</td>
<td>29.7%</td>
<td>11.6%</td>
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<tr>
<td>2001</td>
<td>19.4%</td>
<td>27.8%</td>
<td>15.7%</td>
<td>25.5%</td>
<td>11.6%</td>
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<tr>
<td>2004</td>
<td>20.9%</td>
<td>29.4%</td>
<td>16.4%</td>
<td>21.9%</td>
<td>11.4%</td>
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<tr>
<td>2007</td>
<td>22.5%</td>
<td>29.8%</td>
<td>17.7%</td>
<td>18.3%</td>
<td>11.7%</td>
</tr>
<tr>
<td>2008</td>
<td>22.0%</td>
<td>29.7%</td>
<td>18.4%</td>
<td>18.5%</td>
<td>11.3%</td>
</tr>
<tr>
<td>2009</td>
<td>23.0%</td>
<td>29.8%</td>
<td>18.5%</td>
<td>17.5%</td>
<td>11.2%</td>
</tr>
</tbody>
</table>

- **Alone**
- **Couples**
- **With single child**
- **3 Gen.**
- **Other**
65+ households by gender

Unit of 1,000 households

M. alone
F. alone
Couple
Other
1. Elderly population and care providers

1-4 The Post WWII BB have become the first generation to watch their parents live through their 70s, 80s and 90s.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Male</th>
<th>Total Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40歳未満</td>
<td>8.9</td>
<td>4.3</td>
<td>4.2</td>
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<tr>
<td>40〜49歳</td>
<td>11.6</td>
<td>13.1</td>
<td>12.7</td>
</tr>
<tr>
<td>50〜59歳</td>
<td>20.1</td>
<td>32.3</td>
<td>29.4</td>
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<td>60〜69歳</td>
<td>23.7</td>
<td>26.7</td>
<td>26.0</td>
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<tr>
<td>70〜79歳</td>
<td>27.3</td>
<td>19.7</td>
<td>21.5</td>
</tr>
<tr>
<td>80歳以上</td>
<td>13.5</td>
<td>3.9</td>
<td>6.2</td>
</tr>
</tbody>
</table>
1. Elderly population and care providers

• More elderly people live by themselves as elderly couples or alone.
• Morbidity expanded recently.
• Family members provide assistance and care in a variety of context.
• The majority of family care providers are in their 50s and older.
• Both the elderly and their care providers are and will definitely be in need of help.
• Both groups need to be connected to the social and support networks outside the home.
2-1 Interest in robots and robotics technology among the Japanese is high.
2. Attitude toward robots and robotics technology

2-2 Japanese consumers hold high expectations for robots and robotics technologies

1. Proper level of control
2. Fast processing of massive information
3. High efficiency/minimum redundancies
4. Overcome difficulties and danger
5. Expansion of human abilities and capabilities
Attitude toward robots and robotics technology

6. ”Karakuri“ is fantastic!
7. How close to humans can we make our robots?
8. Friends and companions
Attitude toward robots and robotics technology

2-3 Robots as home appliances (Nikkei Business and Industry, 2003)

- Partner robots: 91% -- under \100,000
- Security robots: 86% -- under \200,000
- Care robots: 81% -- under \300,000
- Housework robots: 87% \300,000
Attitude toward robots and robotics technology

• Japanese generally hold high expectations for robots and robotics technologies to offer viable solution for enhanced daily living.
• Japanese consumers have admirations for the robotics technology.
• Japanese see robots as friend/companion and assistant.
• Consumers see robots as new type of appliances at home.
3. Relevant RT solutions developed or under development

- **Partner robots:** Honda’s Asimo, Toyota’s Partner robot
- **Therapeutic, Pet:** Paro, Sony’s AIBO
- **Takara’s TERA Security**
- **Mitsubishi’s Wakamaru**
Wakamaru acting
Some new development…

Sensor (with real ability for smelling) robots with bio-hybrid technology using feeler antenna DNA of fly and moth to distinguish a large variety of scent and odor under research.
3. Relevant RT solutions developed or under development

- **Robot (pet) capable of building its own individual characters.**
- **Social robots to interact with people.**
- **Humanoid capable of developing own character and interacting with people.**
- **Robots with (sensory) abilities to identify (distinguish among) multiple objects and capable of making better judgements.**
4. Market and service/product needs

4-1 By studying the disfranchised elderly, the government sees its welfare policy focus should be on the elderly living alone (divorced or widowed), and those living under lower socio-economic conditions.
4. Social demands, and market needs

4-2 The elderly in larger urban areas are more vulnerable. Social support network through ICT and robotics for older people living in socio-economically disadvantaged conditions be expanded.
4. Social demands, and market needs

4-3 By providing support, Post WWII BB experience stress of rendering care and assistance themselves and seek/willing to pay for better technological solutions.

They think they have some experience with robotics technology enabled products and services through their use of household appliances.
Stress felt by care providers living with the elderly

- 全体: M 61.4%  F 67.4%
- 40歳未満: M 65.6%  F 71.3%
- 40代: M 73.3%  F 77.0%
- 50代: M 71.1%  F 53.9%
- 60代: M 59.4%  F 67.4%
- 70代: M 69.5%  F 62.1%
- 80歳以上: M 59.7%  F 55.9%
4-4 By providing assistance and care, Post WWII BB became the first generation to watch their parents live through their 70s, 80s and 90s understand that RT need be employed.

They make up an emerging market and provide the critical mass for industry to grow.

They have some time to familiarize themselves with robotics enabled products and services for improved quality of life.

4. Social demands, and market needs
4. Social demands, and market needs

Market opportunities and meet welfare demands by listening to the current care providers.
Today’s care providers will become tomorrow’s market.
The next ten to fifteen years offer markets that provide critical mass for industry.
They are willing to familiarize themselves with robotics enabled products and services for improved quality of life.
5. What is needed

5-1 To improve QOL of the ageing population, we need to study carefully how ageing affect human existence and living.

From the interviews with professional care providers:

1. Social isolation and alienation from family and community
2. Poor organization of information on health
3. Lack of opportunities for training and rehabilitation
4. Difficulties in regulating own daily activities
5. Poor dietary habit due to limited cooking skills
6. Difficulties in accessing commercial information
7. Entertainment or mentally interesting activities
8. High demands for therapeutic solutions
9. Demands for engaging activities and good humour
5. What is needed

5-2 Service process engineering to offer both physical and mental support or solutions.

- Training
- Rehabilitation
- Support
- Care assistance

Organization of vital information on daily living
Organized access to the world outside
5. What is needed

As a core of one’s social identity, family offers

Protection
Health care
Education
Entertainment
Production

Consumption
Love and affection
Reproduction
Child rearing

and serves as a hub of relationships and activities
5. What is needed

5-3 (Re) integration of individuals in familial and social context.

As a core of one’s social identity, family offers:

- Protection
- Health care
- Education
- Entertainment
- Production
- Consumption
- Love and affection
- Reproduction
- Child rearing

Integrate individuals into relationships and social exchange, connect individuals with the community and activities outside the home.
5. What is needed

- Deeper understanding of ageing process, especially through the experiences of care providers.

- “Service process engineering” to develop solutions for managing and regulating daily activities.

- **RT** to help reintegrate the elderly in the familial and social context.

- **RT** must be integrated into a comprehensive” social robots” and be networked in order to connect the lives of the elderly with the outside world, and to the relevant services and information.

- Standardization of user interface.
- Flexibility in product applications and services.