Japan – Lead Market for Age-Based Innovations?

German Institute for Japanese Studies (DIJ)
Tokyo, Japan
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Questions for today’s presentation

1. How can companies turn the “Aging threat” into an opportunity to innovate?

2. Is Japan a lead market for age-based innovations? Why – why not?

3. How can Japanese companies benefit from this? Examples? Learnings?
The neglected challenge – the aging society

- Demographic change is a global phenomenon
  - Populations in many countries aging – Japan at the forefront
  - In parallel many populations shrink (vs. population growth)
- Demographic change is an economic challenge, but may be seen as an opportunity (Drucker, 2002; Kohlbacher & Herstatt, 2011; Magnus, 2009)
  - Shift in customer needs and expectations will lead to new products and services: Silver Business and Silver Products
  - New products, services will lead to growth and new business models, firms and new competition
- Aging can turn out to be a major source of innovation (Drucker, 1985)
What needs – and products – come along with age? Some examples

- Easy-to-use (household)
- Luxury
- Life-long learning
- Food
- Cars
- Housing/Sanitary equipment
- Care-Robots, Rehabilitation
- Drugs
- Computers, Software, Peripherels
- Travel, Insurance, Financials
- Visual support
- Hearing Devices

Nations across the globe are aging rapidly, Japan at the fore-front

<table>
<thead>
<tr>
<th>Years</th>
<th>Japan</th>
<th>Germany</th>
<th>UK</th>
<th>Russia</th>
<th>USA</th>
<th>China</th>
<th>Brazil</th>
<th>World</th>
<th>India</th>
<th>Kenya</th>
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<td>1950</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>34</td>
<td>35</td>
<td>37</td>
<td>35</td>
<td>33</td>
<td>31</td>
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<tr>
<td>1960</td>
<td>35</td>
<td>34</td>
<td>35</td>
<td>35</td>
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<td>40</td>
<td>33</td>
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<td>1970</td>
<td>33</td>
<td>37</td>
<td>37</td>
<td>38</td>
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<td>44</td>
<td>32</td>
<td>32</td>
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<td>1980</td>
<td>34</td>
<td>38</td>
<td>40</td>
<td>40</td>
<td>44</td>
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<td>1990</td>
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<td>41</td>
<td>44</td>
<td>45</td>
<td>45</td>
<td>30</td>
<td>30</td>
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<tr>
<td>2000</td>
<td>30</td>
<td>37</td>
<td>41</td>
<td>44</td>
<td>45</td>
<td>45</td>
<td>30</td>
<td>30</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>2010</td>
<td>29</td>
<td>37</td>
<td>40</td>
<td>44</td>
<td>45</td>
<td>45</td>
<td>30</td>
<td>30</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>2020</td>
<td>28</td>
<td>36</td>
<td>40</td>
<td>44</td>
<td>45</td>
<td>45</td>
<td>30</td>
<td>30</td>
<td>29</td>
<td>29</td>
</tr>
</tbody>
</table>

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- Population Aging and Innovations
- The Role of Lead Markets
- Case Studies
- Observations and Conclusions

Lead market is the market of the first, broad application of a new design. Such designs supersede competing designs in lag markets and become widely dominant.

Typical lead market diffusion pattern

- Example: Telefax-Technology in the 1980ies; Japan was the lead market, although the technology had been originally developed in Germany
- For innovations, success in the lead market is often followed by international success in so-called lag markets
- Lead market designs can displace other, alternative designs
- Thus, knowing your lead market is important for innovating companies!
What determines a Lead Market?

- Concept pioneered by Marian Beise, currently at Ritsumeikan Asia Pacific University
- Lead market have been proven relevant for a number of important products and industries (ICT, Automotive, etc).
- Factors focus on demand conditions
- Factors depend on socio-political, ecological, and cultural system of a country

SOURCE: Beise 2001

Question: Does have Japan the potential to become a lead market for age-based products?

- How „promising“ are the various factors in the Case of Japan with regard to age-based innovations?
Japan’s population will continue to age faster than world average

Median age forecast – Japan, Germany, world average

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2015*</th>
<th>2020*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>44.7</td>
<td>46.4</td>
<td>48.2</td>
</tr>
<tr>
<td>Germany</td>
<td>44.3</td>
<td>46.5</td>
<td>47.7</td>
</tr>
<tr>
<td>World average</td>
<td>29.2</td>
<td>30.4</td>
<td>31.6</td>
</tr>
</tbody>
</table>

* Forecasted value

Resulting in the highest population share aged 65 years and older - market of “aged” will be huge

Population share 65+ years of age, 2010

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>23.0</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>20.8</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>20.3</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>19.0</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>18.4</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>18.3</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>18.2</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>18.0</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>17.8</td>
<td></td>
</tr>
<tr>
<td>Croatia</td>
<td>17.5</td>
<td></td>
</tr>
<tr>
<td>World average (7.7)</td>
<td></td>
<td>2.2% points ahead of first follower</td>
</tr>
</tbody>
</table>

SOURCE: UN DESA World Population Prospects, 2010 Revision
Japanese pensions are among the highest in the world...

Pensions in OECD countries that are most affected by population aging
USD, PPP

<table>
<thead>
<tr>
<th>Country</th>
<th>Price/Cost Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>26,538</td>
</tr>
<tr>
<td>Austria</td>
<td>26,088</td>
</tr>
<tr>
<td>Switzerland</td>
<td>24,185</td>
</tr>
<tr>
<td>Japan</td>
<td>22,425</td>
</tr>
<tr>
<td>Germany</td>
<td>22,395</td>
</tr>
<tr>
<td>Italy</td>
<td>16,687</td>
</tr>
<tr>
<td>Greece</td>
<td>15,626</td>
</tr>
<tr>
<td>Spain</td>
<td>15,505</td>
</tr>
<tr>
<td>Portugal</td>
<td>12,507</td>
</tr>
<tr>
<td><strong>OECD 30 average (18,271)</strong></td>
<td></td>
</tr>
</tbody>
</table>

...on the other side there is a major gap to work income, but this might be compensated by sheer volume

Gross pension replacement rates by earnings, median earner
Percent

<table>
<thead>
<tr>
<th>Country</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iceland</td>
<td>109</td>
</tr>
<tr>
<td>Greece</td>
<td>96</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>90</td>
</tr>
<tr>
<td>Netherlands</td>
<td>89</td>
</tr>
<tr>
<td>Israel</td>
<td>85</td>
</tr>
<tr>
<td>USA</td>
<td>100</td>
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<td>Germany</td>
<td>100</td>
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<tr>
<td>UK</td>
<td>100</td>
</tr>
<tr>
<td>Japan</td>
<td>100</td>
</tr>
<tr>
<td>Ireland</td>
<td>35</td>
</tr>
</tbody>
</table>

* recent crisis-related adjustments not accounted for

SOURCE: OECD Pension Models, 2011
Japan is 4th largest exporter in the world – by that it has access to many potential lag markets in the world.

List of countries by merchandise exports 2012

<table>
<thead>
<tr>
<th>Country</th>
<th>USD billions</th>
<th>% of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>2,057</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>1,564</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>1,460</td>
<td></td>
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<tr>
<td>Japan</td>
<td>774</td>
<td>4.2</td>
</tr>
<tr>
<td>France</td>
<td>567</td>
<td>4.9</td>
</tr>
<tr>
<td>South Korea</td>
<td>553</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>539</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>530</td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>479</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>475</td>
<td></td>
</tr>
<tr>
<td>Rest of world</td>
<td>9,262</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td>18,259</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: The CIA World Fact Book 2012

Looking at all factors Japan seems a very promising candidate as lead market for age-based innovations

Lead market factors
- Price and cost advantage
  - Large market size
  - Fast market growth
- Demand advantage
  - High income
  - Early exposure to needs that other countries will experience later
- Transfer advantage
  - Close international ties
  - Sophisticated and critical customers
- Export advantage
  - Sensitivity to international problems and needs
  - Strong export orientation
- Market structure advantage
  - Strong competition within industries
  - High founding intensity (Start-ups)
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  - Mobility/Rehab: Cyberdyne HAL Suit
  - Telecom: Raku-Raku Phone
  - Eating Aid: My Spoon
- Observations and Conclusions

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**Mental Commitment: Paro Robot Seal**

- Paro robot seal interacts with users, reduces stress, stimulates interaction between users and caregivers, and increases relaxation (source: AIST)
- Developed over 12 years by the National Institute of Advanced Industrial Science and Technology (AIST) of Japan, commercialized in 2005
- USD 15 million development cost financed through public funding
- Lead market factors Japan:
  - **Demand advantage**: early exposure of Japanese market to effects of demographic change and population aging
  - **Transfer advantage**: Japan known for innovation in robotics
- Major purchase by Danish care institutions marked market entry in Europe

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**Paro Robot Seal – Timeline**

- 2005: Paro interactive therapeutic seal robot released for sale in Japan
- 2008: Paro sales launched in Denmark. In the same year, the Danish Technological Institute launches a national effort together with care centers and local councils to
  - Assess the effects of Paro
  - Professionalize the use of robots in welfare contexts
  - Train personnel for their use
- 2009: Paro certified as medical device by US Food and Drug Administration and sales in the US launched
- 2010: By November about 1,800 Paro units sold around the world, over 20% of which to medical and welfare institutions. Paro sales launched in
  - Germany
  - the Netherlands
  - Norway
Paro – diffusion in Japan and selected export markets

<table>
<thead>
<tr>
<th>Country</th>
<th>Launch of sales</th>
<th>2005</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2010</th>
<th>2010</th>
<th>n/a</th>
<th>n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>2005</td>
<td>1,500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>2008</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>2009</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>2010</td>
<td>40-50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>2010</td>
<td>~10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>2010</td>
<td>~10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>n/a</td>
<td>~10</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia</td>
<td>n/a</td>
<td>~10</td>
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</tr>
</tbody>
</table>

92% sales gap to leading export market

1 As of November 2010

SOURCE: Levsen based on Institute for International Studies and Training, 2010

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Mobility/Rehab: Cyberdyne HAL Suit

- Cyberdyne hybrid assistive limb (HAL) suit supports impaired users in standing and walking.
- Developed in Japan under leadership of Prof. Sankai of Tsukuba University; marketed through private company Cyberdyne Inc. since 2009.
- Lead market factors Japan:
  - Demand advantage: Sophistication and experience of robot customers in Japan.
  - Transfer advantage: Japan known for innovation in robotics.
- Close cooperation with German partners has resulted in completion of safety certification in Europe – lead market advantage Europe due to more rapid certification.

HAL Suit – Timeline

- 1989: Prof. Sankai of Tsukuba University, Japan initiated HAL development.
- 1997: First HAL prototype completed.
- Early 2000s: Several prototypes completed.
- 2008: HAL rented out to a number of hospitals.
- By October 2012: Over 300 HALs used in hospitals and nursing homes across Japan.
- February 2013: Global safety certificate issued.
- August 2013: Certified with “European Conformity” (EC) as world’s first robotic device for medical treatment.
HAL Suit – International co-operation for accelerated market roll-out

- Close co-operation of Cyberdyne with German hospital Bergmannsheil in city of Bochum and other German stakeholders
  - 2010: Setup of Cyberdyne Germany
  - 2012: 3 HALs delivered to Bergmannsheil and redesign of old hospital building to HAL patient treatment facility
- Certification as medical device in accordance with European Medical Device Directive (MDD) in August 2013 (CE mark)
- Setup of Cyberdyne Care Robotics in Germany in August 2013
  - Manage Bochum patient facility
  - Roll-out HAL suit in German-speaking market (Germany, Austria, Switzerland)

CE certification in accordance with MDD allows large-scale market roll-out of HAL

HAL Suit – Europe at regulation advantage?

- Developed and initially evaluated in Japan
- Medical device certification in Japan still pending – only use as “welfare device”
- Medical device certification attained in Europe in August 2013, shown by CE mark (CE)

- Certification as medical device is major hurdle for bringing HAL suit to markets around the world – first trials conducted under provisional safety permit
- Medical device certification in most countries decisive for insurance coverage
- Certification process in Japan extremely difficult – certification process in Europe faster
- Countries that complete certification first have important adoption advantage and have higher chances to become lead market

Is Japanese regulation too strict to implement assistive robot innovations?
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Telegram: Raku-Raku Phone

- Simplified mobile phone based on the principle of universal design – “a phone that can be used by anybody”
- Raku means “easy-to-use”
- Two innovation efforts:
  - First model by Panasonic upon request of NTT DoCoMo (1999)
  - From model II on development and production by Fujitsu (2001)
- Development of Raku-Raku phone driven by collaboration with NTT DoCoMo
- Lead market advantage Japan:
  - Demand advantage: NTT DoCoMo as major and sophisticated customer
  - Price and cost advantage: scale of Japanese market regarding mobile phones for elderly

SOURCE: Kohlbacher
**Raku-Raku Phone – Timeline (1999-2009)**

- Rapid release of Raku-Raku phone models
- 20 million Raku-Raku phones sold in Japan between 2001 and 2013

**Raku-Raku Phone – Timeline (most recent)**

- 2012: smart phone version introduced
- June 2013: first foreign market entry in France with Raku-Raku smart phone
- August 2013: Raku-Raku smart phone 2 introduced in Japan
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Eating Aid: My Spoon

- Eating aid robot to address
  - Chewing and swallowing problems,
  - Motor control problems,
  - Sitting posture problems,
  - Vision and cognitive issues
- Developed over 10 years by Secom Co. of Japan, funded by the Association of Technical Aids
- Currently available in Japan (Secom) and Europe (FOCAL Meditech)
- Lead market factors unclear at this time – very Japan-specific innovation design
  - Compatibility requirement with Japanese-style steep edge of plate
  - Different power unit required for European model (both voltage and power use)
My Spoon – Timeline

• 1992: first discussed at 7th RESJA Annual Conference – “Meal assistance robot as a device for people with quadriplegia” (S. Ishii, F. Hiramatsu, S. Tanaka and Y. Amari)
• Continuous technical improvement
• 2003: most recent listed scientific publications
  – “Case study of the meal assistance robot”
  – “Clinical application of the meal assistance robot”
  – “The Development of Meal-Assistance Robot ‘My Spoon’”
• Product adoption remains a challenge:

“(…) sales of a Secom product, My Spoon, a robot with a swiveling, spoon-fitted arm that helps older or disabled people eat, have similarly stalled as caregivers balk at its $4,000 price.


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**Conclusion**

- There is a need and a growing market for age-based innovations – universal design does not address all age-associated challenges and there is plenty of room for age-dedicated products/services.
- Lead markets and lag markets do exist – some countries adopt age-based innovations more readily than others.
- Japan offers good conditions to become a lead market in age-based innovations (many still untapped fields).
- However, in order to capture this potential, Japanese age-based innovations need to also consider needs, preferences, and other external conditions in foreign markets – making products and services more “exportable”.
- With regard to products that need to go through extensive approval and accreditation, Japan should collaborate internationally in order to get products into the market and build up a certain level of pressure on the domestic approval agencies (WTO-approvals, ECE).

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**Japan has missed a number of attractive product opportunities: Example Indoor Mobility: Stair Lifts**

- Originally developed in 1923 by C.C. Crispin in the USA for a sick friend who could not use stairs.
- Between 1923 and 1962 only available in the US market.
- Lead market factors USA:
  - Demand advantage: stair lift industry in early years almost exclusively serving wealthy homeowners.
  - Transfer advantage: stair lift internationally popularized with American Hollywood movies between the 1940s and 1960s.
- Spread of 1962 “Inclinette” design to international markets (lead market design).
- International transfer of innovation via traveling businessman, grandson of largest Dutch elevator maker.
Japan has missed a number of attractive product opportunities: Example Rollator Walkers

- Developed in 1978 by polio sufferer Aina Wifalk in Sweden for her own use
- Quickly adopted in Sweden, but more than a decade of delay before adoption in other European countries
- Lead market factors Sweden:
  - Price and cost advantage: quick creation of economies of scale due to (1) large purchasing volume and (2) centralized purchasing process of Swedish social security systems
- Continued leadership in rollator design in Central Scandinavia (Sweden, Norway)
- Rapid spread to other European markets – especially Germany – since early 1990s
- Today still substantial country-specific differences in market penetration

Rollators – diffusion in lead market and selected lag market

Annual rollator sales
Units sold per 100,000 inhabitants


1 = values Germany interpolated
Japan has missed a number of attractive product opportunities. Example: Reverse Mortgages:

- "A reverse mortgage enables older homeowners (62+) to borrow against the equity in their homes without having to sell the home, give up title, or take on a new monthly mortgage payment" (NRLMA)
- First developed and adopted in the United Kingdom
- Lead market factors UK:
  - Demand advantage: customers with advanced knowledge or financial and mortgage products
  - Transfer advantage: UK known for innovation in financial services
- USA – although originally lag market – have played exceptional role in RMs, e.g. through early regulation that facilitated market growth (regulatory advantage)

Reverse mortgages – diffusion in lead market and selected lag market

Annual reverse mortgage production
Contracts signed per 1 million inhabitants

SOURCE: Levensen based on SHP Equity Release 2011, NRLMA 2012, Maddison 2010
“Cultural distance” as a major hurdle to benefit from lead market advantages? Not sufficient to explain!

Country comparison of cultural parameters: Japan, Germany, United States
non-dimensional

- Japan culturally strongly divergent from other advanced economies
- Japanese innovations may be perceived in a different cultural context abroad
- Role of elderly in a society closely linked to domestic cultural values
- International diffusion of Japanese innovations with strong link to Japanese culture may be difficult

Hofstede 5D model of national culture:
- Power Distance (PDI)
- Individualism versus Collectivism (IDV)
- Masculinity versus Femininity (MAS)
- Uncertainty Avoidance (UAI)

Management implications for globally successful innovations (1/2)

Price/cost advantage
- How robust is the value proposition of our innovation in countries with different cost structures (e.g. different level of labor costs for elderly care)?
- Is our innovation viable in smaller markets than Japan with lower economies of scale?

Demand advantage
- Does our innovation changes in the environment (trends) that will not only affect Japan but also other countries?
- At what time will these trends affect other countries?
- Are there already potentially competing local solutions in other countries?

Transfer advantage
- Is Japan perceived as the global leader in an innovation category?
- Are Japanese innovation designs perceived as very Japan-specific or do they incorporate needs and preferences from other countries? Specific market research is needed!
Management considerations for globally successful innovations (2/2)

- Is there strong export orientation of our company?
- How well do we know our export markets? Do we understand the end customers' needs there?
- Do we have an organizational setup facilitating to implement innovations abroad? Do we have resources in leading country markets for our innovation like local application engineering?
- Are our age-based innovations well-positioned within our company structure? Would a spin-off, FDI in target markets, or an innovation strategy based on M&A have advantages?
- Are we sure that we are tracking competitors in the most innovative and dynamic markets?
**Stair Lifts – Timeline**

- 1923: developed and patented by C.C. Crispen, Pennsylvania, USA
- 1924: establishment of stair lift company “INCLINATOR Company of America”, 1 stair lift sold
- 1925: 6 inclinators sold
- 1928: first model for winding stairs developed
- 1947: first US competitor enters market
- 1940s to 1960s: Oscar-winning and nominated movies feature stair lifts, making the product internationally known
- 1960: owners’ grandson of largest Dutch elevator maker “Jan Hamer en co” travels to the US and witnesses stair lifts
- 1962: first non-US stair lift available by Jan Hamer and Co – model directly based on US stair lift design
- 1960s/1970s: stair lifts introduced in all European markets, new companies founded

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  - Telecom: Raku-Raku Phone
  - Eating Aid: My Spoon
  - Indoor Mobility: Stair Lifts
  - Outdoor Mobility: Rollator Walkers
  - Financial Services: Reverse Mortgages
- Observations and Conclusions
**Rollators - Timeline**

- 1978: developed as a user innovation by Swedish polio sufferer Aina Wifalk
- 1988: Swedish rollator sales above 30,000 units
- 1990: first availability of rollators in largest European market Germany
- 1993: Swedish sales exceed 40,000 units
- 1996: first import of 1,600 units into the US
- 1998: Queen Ingrid of Denmark uses a loaned rollator for first time in public, becoming “a powerful image that encouraged others not to be ashamed of their rollators”
- 2000: US sales at 20,000-40,000 units
- 2000: three main Swedish makers produce 150-175,000 units annually, exporting >50%
- 2005: German insurance-covered rollator sales are at ~500,000 units per year
- 2012: approximately 2 million rollators in use in Germany, making it the biggest country market worldwide

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Reverse Mortgages – Timeline

- 1930: UK-based Home & Capital Trust Ltd. Develops "home equity reversions", a precursor to reverse mortgages
- 1961: first RM in the United States by Nelson Haynes of Deering Savings & Loan: the mortgage recipient is Nellie Young, the widow of Mr. Haynes's high school football coach
- 1965: Home Reversion offers the first reversion income scheme in the UK
- 1981: – Incorporation of non-profit National Center for Home Equity Conversion (NCHEC) in Madison, WI, US
  - Initial exposure of reverse mortgages through nationwide media in the US (Newsweek, Time, U.S. News, Good Morning America)
  - Musashino municipality near Tokyo launches first Japanese RM pilot
- Since 1984: several bills passed by U.S. Congress to promote RMs (e.g. mandating federal insurance, tax treatment of RMs, consumer protections)
- 2000: UK annual volume of signed RMs exceeds 10,000 contracts for the first time – two years before reaching 10,000 contracts in the US market
- 2006: market peak of RMs in the UK (~30,000 contracts), beginning of market contraction in UK market

Reverse mortgages – diffusion in lead market and selected lag market

Reverse mortgages signed in 2007
Contracts signed per 1 million inhabitants

<table>
<thead>
<tr>
<th>Country</th>
<th>Contracts per 1 million inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>467</td>
</tr>
<tr>
<td>USA</td>
<td>357</td>
</tr>
<tr>
<td>Sweden</td>
<td>277</td>
</tr>
<tr>
<td>Spain</td>
<td>89</td>
</tr>
<tr>
<td>France</td>
<td>3.1</td>
</tr>
<tr>
<td>Germany</td>
<td>1.2</td>
</tr>
</tbody>
</table>

SOURCE: Levesen based on Fornero et al. 2011, NRMLA 2012, Maddison 2010
Designing products for everyone or specifically for old people?

<table>
<thead>
<tr>
<th>Universal design</th>
<th>VS.</th>
<th>Age-based innovations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designed to maximize usability by diverse users – irrespective of age</td>
<td><strong>VS.</strong></td>
<td>Designed primarily for use of aged users</td>
</tr>
<tr>
<td>Kitchen grips</td>
<td><strong>VS.</strong></td>
<td>Stair lift</td>
</tr>
<tr>
<td>Ring plug</td>
<td><strong>VS.</strong></td>
<td>Rollator</td>
</tr>
<tr>
<td>Higher market potential</td>
<td><strong>VS.</strong></td>
<td>Incorporating age-specific needs and preferences</td>
</tr>
<tr>
<td>Potentially costly over-engineering of design features</td>
<td><strong>VS.</strong></td>
<td>May be necessary where universal design is not available</td>
</tr>
<tr>
<td>May not always be possible or economically advantageous</td>
<td><strong>VS.</strong></td>
<td></td>
</tr>
</tbody>
</table>

• Higher market potential
• Potentially costly over-engineering of design features
• May not always be possible or economically advantageous