

S. Su (Convener). How to develop good gerontechnology products and services by consumer research? Gerontechnology 2014;13(2):134; doi:10.4017/gt.2014.13.02.418.00 **Participants** C-W. Tang (Taiwan), H-D. Chih (Taiwan), H-J. Yeh (Taiwan), J-J. Chan (Taiwan) **Issue** As 14% of the population will be older than 65 years old by 2018¹, Taiwan is expected to migrate from an 'aging society' to an 'aged society'. Many companies and R&D projects have been focusing on developing gerontechnology products and services. In our observation, consumers' self-esteem, living situations, and cultural traditions are often overlooked in the development process, while developers often pay more attention to function and performance of the devices. This symposium hosted by Industrial Technology Research Institute (ITRI), the R&D flagship in Taiwan, contributes to the question, "How can we develop good gerontechnology products and services?" **Content** This symposium will first introduce why ITRI has focused on consumer research in recent years. Then there will be four presentations: (i) how the elderly's preference for walking and exercise affects aging and postpones early limitations (C-W. Tang); (ii) how Chinese and Taiwanese citizens differ in their consumption of medicine and their willingness to see doctors; (H-D. Chih); (iii) how the 'Active-aging Easy Personal Mobility Service' enables Taiwan's active aging population to enjoy personal mobility (H-J. Yeh); and (iv) Key factors of next generation of portable supporting devices for older adults (J-J. Chan). All four presentations will address how consumer research helps R&D teams understand their customers. **Structure** There will be four oral presentations and Q/A sessions followed by a panel discussion. Based on insights gained from the case studies, the panel discussion will focus on the questions, "Why is consumer research necessary for gerontechnology products and services?" and "How to do consumers research before developing gerontechnology products and services?" **Conclusion** This symposium will demonstrate ITRI's recent developments, and how the Industrial Economics and Knowledge Center's expertise will help R&D teams and companies reduce risk in product development.

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Keywords: consumer research, active aging, user central

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C-W. TANG, J-U. LIN, Y-T. LIN, J-H. CHAO, H-C. HUANG. Study on needs exploration of lower limb robotic exoskeleton for elderly. Gerontechnology 2014;13(2):134-135; doi:10.4017/gt.2014.13.02.328.00 **Purpose** A robotic exoskeleton is a promising device to support and expand the physical capabilities of users. The Lower Limb Robotic Exoskeleton (LLRE) could help the elderly walk and retain physical strength. A number of companies, including Honda¹, Toyota², and CYBERDYNE³ have introduced prototypes. The mobility demand of elderly with movement restrictions (EMR) has been noticed. However, this kind of product has not yet become available to everyone because the R&Ds of those LLREs mainly focused on the improvement of physical function and performance but not the elderly patients' self-esteem or psychological state. This causes target users to avoid using LLREs. Therefore, the aim of this research is to obtain the potential requirement of LLREs for active aging. **Method** LLRE is a relatively unknown but developing product. Because it is difficult to find users, we have applied several methods of qualitative research in this study. First, the related literature for physical requirements and psychological preference of walking and exercise for the elderly was reviewed. Second, four researchers with diverse knowledge domains were interviewed, including those involved in the mechanics of human movement, elderly rehabilitation, assistive technology, and elderly care. Third, the Ansoff Growth Matrix of 30 related walking assisted devices was proposed. Fourth, a participant observation method was applied to a rehabilitation group. Fifth, detailed interviews with two potential users were conducted. Moreover, an evaluation grid method and grounded theory were adopted to analyze these interviews. **Results & Discussion** The elderly group with restricted mobility was first defined as the Taiwanese above 55 years old with minor diseases of walking (e.g., sarcopenia, knee osteoarthritis,

stroke with level 4 to 6 of Brunnstrom recovery stage⁴). Furthermore, the upper middle class of EMR are the potential users for LLRE due to their positive attitudes toward seeking happier retirement. According to Eastern Integrated Consumer Profile⁵, the most popular dynamic activities for EMR are walking and exercise. Therefore, LLREs should be marketed as an outdoor sporting equipment instead of an assisted walking device. An LLRE designed as a fashion accessory could prevent users from being labelled as disabled and boost their self-confidence. An LLRE might also apply to outdoor community activities, which might improve interpersonal interaction. Therefore, resistance training and health information monitoring are needed, as well as walking assistance. The resistance training could effectively develop the leg muscles to improve the effects of minor walking diseases. The health information could be designed as entertaining elements to inspire community interaction by comparison of EMR. Finally, a novel concept design of LLRE is proposed. The model may provide a new lifestyle to promote active aging.

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H-D. CHIH. Discovering business opportunities for the elderly in China by consumer survey: An example. Gerontechnology 2014;13(2):135-136; doi:10.4017/gt.2014.13.02.419.00

Purpose While the consumptive power of Chinese people is growing fast, the demographic of China is also changing quickly. Mainland China has rapidly transformed into an aging society. In 2009, the Chinese population over the age of 65 stood at about 106 million people, but in 2025 that number is expected to reach 120 million people. Taiwan's society faces a similar situation. According to the CEPD's population projection, more than 20% of Taiwan's population will reach 65 years of age by 2025¹. The increasingly elderly population means the influence of the elderly as consumers is growing. In considering the changes in the socio-economic situation of both sides of the strait, the Industrial Technology and Knowledge Center (IEK) began to conduct consumer surveys related to the elderly population to help understand the needs and behavior of the elderly related to health care. **Method** The IEK developed and clarified trends in the behavior of elderly consumers and developed a questionnaire accordingly. This survey was conducted in Beijing, Shanghai, Guangzhou, Chongqing, Chengdu, Wuhan, Taipei, Taichung, and Kaohsiung during 2012. **Results & Discussion** According to the survey, the respondents are optimistic about their life as elderly people. Nevertheless, significant differences exist across the strait in Taiwan when compared to the six cities of mainland China analyzed here. Overall, the respondents of first-tier cities in China are more optimistic than those living in the second-tier cities. In addition, the respondents from mainland China are more optimistic than the respondents from Taiwan. Differences also exist between those living across the strait and in the six cities of mainland China regarding the healthcare related behaviors of the elderly. For example, illness is dealt with differently. Respondents from mainland China are more likely to buy medicine without seeing doctors (61%), and prefer to use Chinese traditional medicine (50%). For respondents from Taiwan, seeing a doctor is their first choice. Aside from seeing doctors, many respondents from Taiwan prefer to rest when feeling tired or uncomfortable (49%). Furthermore, the research team was trying to find business opportunities based on the results of the survey. For example, according to the survey, respondents from mainland China prefer to use Chinese medicine to treat the symptoms of aging (13%). They would recommend the concept of 治未病 (Chinese medicine) and say it is helpful

for developing anti-aging solutions for the elderly in China. Also, because the respondents of Guangzhou have the highest amount of acceptance of Chinese medicine of these six cities, Guangzhou could be a proper market for testing new anti-aging solutions related to Chinese medicine.

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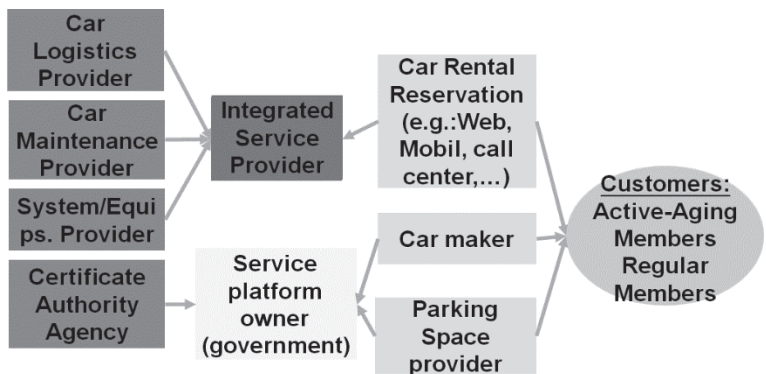
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H-J. YEh, L-C. CHUANG, W. LING. **Personal transportation business opportunities for Taiwan’s baby boomers.** *Gerontechnology* 2014; 13(2):136-137; doi:10.4017/gt.2014.13.02.401.00

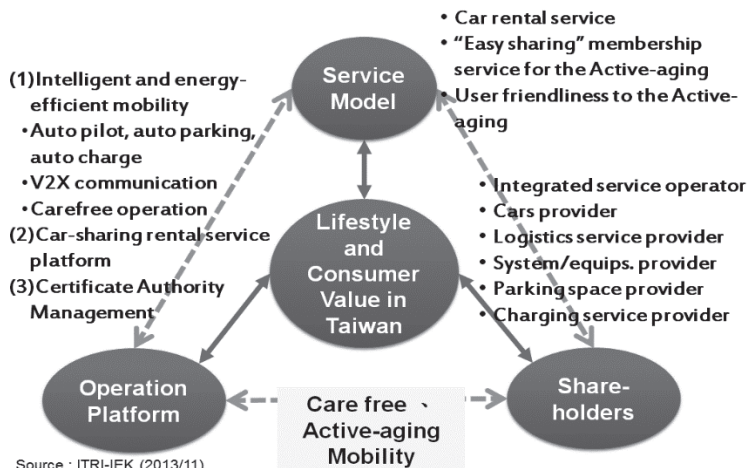
Purpose Active-aging is a global trend. In Taiwan, active-aging baby boomers (born between 1946 and 1966) have become an important market segment¹. They have largely unmet personal transportation needs. A cross-divisional exploratory research project was carried out with the goal of identifying the aforementioned social needs and business opportunities at the Industrial Technology Research Institute (ITRI). This research project investigated such needs and opportunities. **Method** A multi-disciplinary research team was formed with a background in design thinking, automotive systems, automotive service and battery. The team used the ‘Outside-In’ STEEP² (Social, Technological, Economic, Ecological, Political/Legal) approach to identify and prioritize the daily personal transportation needs and lifestyle values of Taiwan’s baby boomers, and proposed a new personal transportation product and business idea. Then a focus group, consisting of three men and four women from 55 to 75 years old were interviewed to confirm the needs, values and products of these people, and to provide input into business ideas that resulted from the STEEP analysis. ValueWeb³ is used as a tool to present the various roles associated with these proposed new products and services (Fig-



Source : ITRI-IEK (2013/11)

Figure 1. Value web for the ‘Active-aging Easy Sharing Personal Mobility Service’

ure 2). ValueWeb³ is used as a tool to present the various roles associated with these proposed new products and services (Fig-



Source : ITRI-IEK (2013/11)

Figure 2. Value triangle for the ‘Active-aging Easy Sharing Personal Mobility Service’

ure 1). **Results & Discussion** (i) Cars equipped with age- and user-friendly technologies, such as emergency brake assist, (EBA), auto parking, and lane-keeping systems (LKS) have a promising market potential. (ii) Taiwan's baby boomers, on average, have accumulated generous assets, are able to afford cars and are interested in financial investments. But they are tired of the nuisances related to regular car maintenance and prefer to leave an inheritance to their children. (iii) A new revenue-generating 'Active-aging Easy Sharing Personal Mobility Service' business idea has resulted from this investigation. This business idea will allow Taiwan's active-aging baby boomers to enjoy carefree personal mobility, while reducing operational costs by adopting age-tailored driver-assisted technologies, environmentally-friendly car incentives, as well as car-sharing and revenue generating operations (Figure 2).

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J-J. Chan, L-C. CHUANG, H-J. YEH. Key factors in the design of next generation portable supporting devices for elderly adults. Gerontechnology 2014;13(2):137-138; doi:10.4017/gt.2014.13.02.317.00 Purpose

This study began with an analysis of the lifestyle trends of elderly adults in Taiwan. We found that the elderly believe in 'active aging', and their core values gradually change from family focus to connection with people and planning their 'second lives'. Based on secondary sources, elderly adults enjoy going outdoors and exercising more than in previous generations. Walking and mountain climbing are the most popular activities. We found five common lifestyle patterns among the elderly: (i) joining community activities, (ii) enjoying family life, (iii) interacting with friends, (iv) watching and participating in recreational sports, and (v) participating in charitable religious activities. Physiological aging becomes increasingly apparent as people age, for example, knee pain while walking and mountain climbing, an inability to sustain exercise for long periods, and more time needed to recover from body fatigue. In light of this, we initiated plans for a device with which older adults can extend their activity time. This device should be lightweight and easy to use and carry. We benchmarked commercial products and did not find suitable products. Therefore, this study presents the planning and development of 'next generation portable supporting devices'.

Method Questionnaires were distributed to older adults participating in community activities in order to better understand the behavioral patterns in the everyday lives of 'active' older adults. Three lead users were interviewed to analyze how the

Table 1. Results of the analysis in 'Need-Solution-Differentiation-Benefit'

Domain	Items
Need	-Can help long walk and mitigate the burden of discomfort -Everything operates independently without reliance on others and avoid being seen as useless person -Maintain previous lifestyle (go traveling, guest-house visit)
Solution	-Integrating lot of functions -Both practical and aesthetic -Smooth and easy to operate
Differentiation	-Light weight and easy to handle -Design style is simple and neat -Overall structure of the solid looks safe -For users easy to handle without too much learning experience
Benefit	-Can go outside to promote healthy and reduce fatigue -Can act independently without others help or care, to maintain the dignity of his/her own -Easy to collapse, lightweight, does not increase the body burden with additional weight; easy to carry, increasing domestic and international travel opportunities and facilitating the exchange of feelings with family and friends

elderly use commercial assistive devices. According to the questionnaire results and analysis, some key factors were found for the design of next generation portable supporting devices for older adults. **Results & Discussion** *Table 1* shows the results of the analysis in Need-Solution-Differentiation-Benefit. The key factors for the design were derived from the questionnaire results and include: (i) The device appears safe when it is being used. Safety features include high durability and an absence of sharp edges. (ii) The device is lightweight and portable, can be easily folded for storage, and is easily adjustable. (iii) The device has a stylish appearance, but is not conspicuous. In addition, it can be used to call the hospital, police, or home in emergencies. Based on the analysis, we generated seven design concepts for next generation portable supporting devices for elderly adults. We are in the process of developing the concepts into a commercial product that is different from existing commercial products and has more advanced technology and a more innovative design concept.

Keywords: mobility & transport, portable supporting device, active ageing

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