

The kitchen supply design based on Kansei engineering study for the elderly user of independent

Peng-Jyun Liu¹, Sheng-Houng Lin², Ching-Yi Wang³, Ming-Chuen Chuang⁴

¹ Institute of Applied Arts, National Chiao Tung University, 1001 University Road, Hsinchu, 300 Taiwan, ROC & Department of Creative Product Design, Asia University, 500, Lioufeng Rd., Wufeng, Taichung 41354, Taiwan, ROC, yu4038@asia.edu.tw

² Department of Creative Product Design, Asia University, 500, Lioufeng Rd., Wufeng, Taichung 41354, Taiwan, ROC, linsh@asia.edu.tw

³ Department of Creative Product Design, Asia University, 500, Lioufeng Rd., Wufeng, Taichung 41354, Taiwan, ROC, catincar@gmail.com, Corresponding Author

⁴ Institute of Applied Arts, National Chiao Tung University, 1001 University Road, Hsinchu, 300 Taiwan, ROC, cming@faculty.nctu.edu.tw

Abstract : The world's elderly population (Age over 60 years) rapid rise and to 22% of the total population and will more than children (under 15 years) population in 2050. The World Health Organization (2002) Active Aging concept, Promote the importance of maintaining the autonomy and independence of the elderly clarify. This study used inductive method such as lifestyle population surveys, focus group interviews, Kano model, and QFD (quality function deployment). The results show that important for having independent living for to study the possibilities of designing kitchen supply for the independent aging. The most important design elements for elderly using kitchen supply are to have the anti-hot pot body, fast heat conduction, heat dissipation, no slip handle, lightweight and easy to pick up, and in line with the hand.

Keywords: QFD deployment matrix, elderly user, independent living, active ageing, kano model

1. INTRODUCTION

1.1 Background

The aging population of the global is growing. According to United Nations, that the estimated global elderly population in 2045 for the first time beyond the children (under 15 years) population. This trend will produce huge social and economic burden, and have to be early to responded. Many studies have confirmed that with independent living and regular physical activity can bring many health benefits. Effective physical activity to enhance the functionality of the elderly daily life, health, fitness and quality of life are of great help and also achieving pleasant living (Ming-Jen Yang, 2010). According to the concerned areas of research (including health, economic independence, the degree of independent living) it is also that founding elderly user living independently more positive attitude, the higher the degree of independence of living persons, higher life satisfaction (Lin Yi-shan, 2007).

1.2 Research purposes

This study aim is to promote the autonomy and independence of older people to maintain life, and the use of resources in the central region of the metal industry, the development kitchen supply of the elderly user. By kitchen supply research to improve the motivation of the elderly cook, help the elderly to live independently with dignity, and both self-maintenance and body healthy daily diet, creating a sense of pleasure and happiness. Also, the metal industry in central Taiwan for the vehicle, This study may change the traditional manufacturing and design thinking, then, increase sales target customer groups, enhance economic output, increasing company profits, and build their own brand in Taiwan.

2. LITERARY REVIEWS

In order to create and give elderly user that a satisfactory and enjoy life for kitchen supply design, Our research to find out from the literature with the "independent" about the elderly population and comprehensive of the all kinds of researchers definition lifestyle are summarized in Table 1. Overall, the life style is defined scope from the study of human habits, life, behavior, culture, etc., and to make inferences and classification of different ethnic approach.

AIO dimensional types more suitable for applications in large-scale surveys and quantity, and also the most widely adopted by most researchers approach. AIO Scale is divided into: (1) general lifestyle, and (2) certain of the lifestyle scale (Engel et al, 1978.), our study used the first general lifestyle scale, to overall understanding of elderly user in general lifestyle. Reynolds & Darden (1974) considered lifestyle (Table 2), including: (1) Activities (activities), (2) interest (interests), and (3) comments (opinions), but each study is bound to contain all the variables, so our study, depending on their research projects to select, filter or change variables needed. Our study was designed to classify the objects that meet "independence" ethnic characteristics, to serve as future visit. Taiwan in recent years, researchers measured using AIO for elderly user in various lifestyle which summarized in Table 3.

Table 1: Lifestyle definitions

| Researcher | Definitions |
|-----------------------------------|---|
| Mei-Ling Yeh (2007) | Lifestyle with the residents or consumers grouping characteristics, and can reflect the specific behavior of individuals and ideas |
| Hawkins, Best, & Coney(2001) | Person's lifestyle is the concrete manifestation of the concept of self-caused, through past experience, inner thoughts and the prevailing situation, produce the combined effect of these three |
| Engel, Blackwell, & Miniard(1995) | Lifestyle is a form of human life and spend time and money, reflecting the activities undertaken by individuals, ornaments and opinions on various topics of interest. |
| Kotler(1991) | Lifestyle is to describe the situation of personal interaction with the environment |
| Assael(1987) | Proposed lifestyle is widely defined as a way of life, and this mode can be three ways to identify, has also become the main basis AIO scale: (1) how people use their time (activities); (2) What is their living surroundings of the important things (interest); (3) their perception of themselves and those around them (opinion) |
| William Lazer(1963) | Lifestyle is a system concept, is a group on the life and consumer has the characteristics to explain differences in the groups with other groups, so the lifestyle is the sum of culture, values, and legal forces caused |
| Kelly(1955) | Lifestyle is a person's cognitive architecture, rather than the social system, because everyone has their specific cognitive architecture, because everyone has a particular lifestyle. |

Table 2 : AIO lifestyle Scale

| Dimensions | Definitions |
|------------|--|
| Activity | Refers to a specific and distinct activities can usually be observed directly, however the reason it is difficult to directly measure |
| Interest | Refers to certain things, events or topics excitement level that allowing people to produce special and sustained attention |
| Opinion | Refers to the individual in question puncture under certain situations shock reaction, given oral or written statements, can be used to describe a personal explanation for things, expectations and assessments |

Source: Reyonlds & Darden(1974)

Table 3: elderly user in all facets clustering literature review

| Researcher | Topic | Clustering name |
|-----------------------------------|--|---|
| Zeng Bo Xun (2008) | Research retirement lifestyle satisfaction with the use of the park | Interest orientation Independence Leisure Leader |
| Wang Pei-Yun、 Su Ja-Cho(2006) | Research using adult lifestyle relations with the media | Feeling of supremacy Self-centeredness Aggressive |
| Zhang L, Chen Guang-hua (2006) | Research elderly buying behavior Long-term care market in Taiwan | Traditional and conservative Aggressive Optimistic attitude to life |
| Liu Yan Ying, Wang Hui Xuan(2005) | Research middle-aged care retirement community for coherent attitude in the city | Opening and focus on brand Conservative, traditional and diligence Emphasis on health and not care substance Optimistic attitude to life |
| Guo zheng-De | Research seniors participating leisure, lifestyle factors and obstacles | Emphasis on the family Self calm Information access Self requirements |

3. RESEARCH METHODS

Our study used four kinds of research methods include: (1) lifestyle scale, (2) Kano model (Figure 1), (3) QFD (Figure 2), and (4) focus group interviews. Products are metal products industries with growth potential in central Taiwan, while setting the kitchen supply as subjects and setting target customers over 65 years old, with an independent features in Taichung, Taiwan. Contents divided into several stages, the step shown in Figure1.

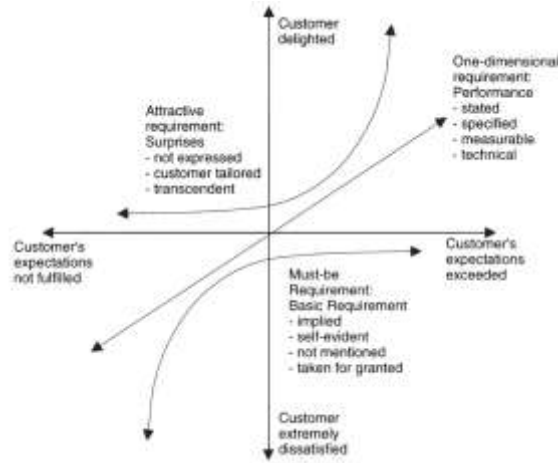


Figure 1: The Kano model of customer satisfaction

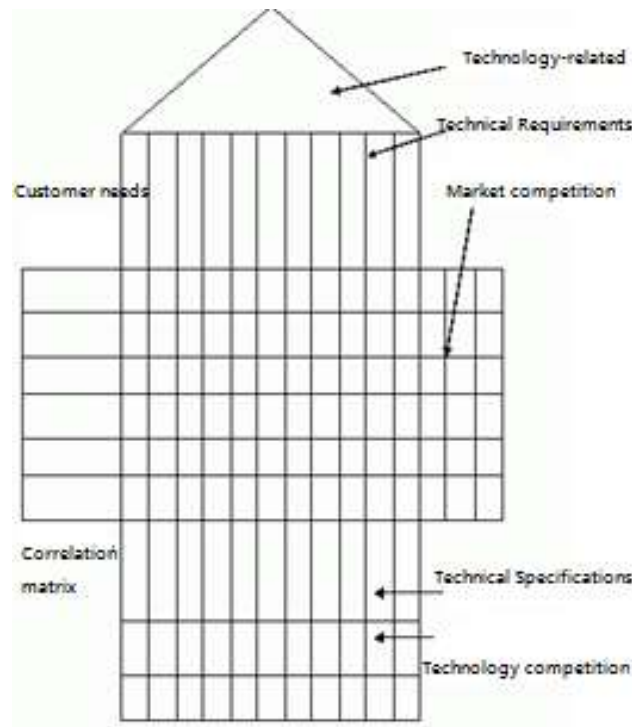


Figure 2: Schematic QFD

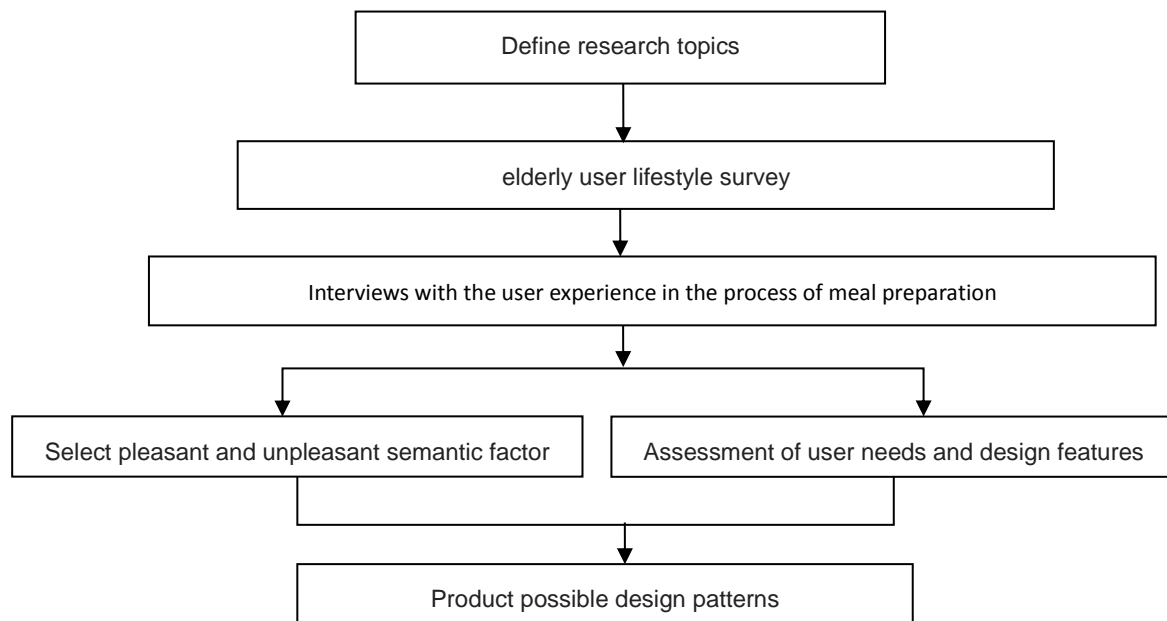


Figure 3: Research Steps

4. THE FINDINGS

Based on the number of people over the age of 65-74 (Table 1) for the 140,987 people in Taichung City. Experiments taken calculate 95% confidence lower (error is 5%). This study distributed 384 questionnaires that using Internet questionnaires and paper questionnaires survey.

The results of basic information, respondents were mostly women, age distribution between 65-69 years old, they live in urban areas the most, most married, spouse alive, almost illiterate, educated in high school the most, mostly in retirement status. Their favorite activities at home, there are usually at home cooking up a week 5-6 week, you can prepare your own meals independently

This study using factor analysis (chi-square test correlation is 2294.71, the significance level of $p = .00$; sampling suitability to KMO (Kaiser-Meyer-Olkin measure of sampling adequacy criterion value of 0.8, Luo Wenkun, 1986), Extraction elderly user lifestyle includes live and work, health and enjoyment, practical and authority, traditional and conservative, brand-oriented.

Select "live and work" and "health and enjoyment" as the representative of in-depth interviews, because this group has a healthy, positive, helpful, and pay attention to the characteristics of home life, and these are related to independence and enjoy life

From the "live and work" and "health and enjoyment" selected population scores higher, and the need is much higher than the overall average score of 384 for the elderly user that as the representative of focus (Table 4)

The first stage of the process enjoyable experience for meal preparation part, using in-depth interviews (in-depth interview) in the focus group interviews, the use of unstructured interviews (Wulz, 1990), the interview lasted two hours and a half, a break once divided for two echelon proceed. The results showed that:

1. Respondents cook one meal a day on average that mostly for dinner.
2. The pantry behavior includes washing, cutting, cooking, cleaning utensils
3. The findings pleasure vocabulary has 27 words, unpleasant words a total of 20, and the corresponding kitchen supply such as Table 28, and the findings focus on the most pleasurable feeling is wok

Table 4: Overview of focus group respondents in each grouping average

| NO | NAME | live and work | health and enjoyment | practical and authority | traditional and conservative | brand-oriented |
|---|-----------|------------------|----------------------|-------------------------|------------------------------|-----------------|
| S1 | Mr Zhang | 3.88 | 2.43 | 2.60 | 3.00 | 0.67 |
| S2 | Mr Lin | 2.38 | 3.43 | 2.40 | 1.33 | 1.67 |
| S3 | Miss Jane | 3.75 | 1.57 | 1.60 | 3.00 | 0.67 |
| S4 | Miss Ye | 2.13 | 3.00 | 2.60 | 1.33 | 2.33 |
| S5 | Miss Shi | 1.88 | 2.71 | 2.20 | 2.67 | 2.00 |
| The total average | | 3.03(234 people) | 2.69(89 people) | 2.83(15 people) | 3.29(15 people) | 2.81(7 people) |
| Total 360 people (Deduction across two or more ethnic groups) | | | | | | |

The second phase of the study user requirements and design features, the use of focus group findings arising from pleasure, to understand the needs of attractive, and be constructed QFD house (QFD) interviews. The results showed that:

1. Kano model Findings
 - (1) The pot body attractive (value> 18), including aperture size, fast heat conduction, easy to clean, basic functions, durable, non-stick pan, suitable size, material, member location, shape, heat, and can not afford to smoke qualities.
 - (2) The handle attractive (value> 18), including insulated 、 lightweight and easy to get, easy to clean, in line with the hand.
2. QFD Findings
 - (1) pick out a user needs more than four points or more important factor (Figure 14)
 - (2) The most important body of the pot to prevent hot, fast heat fast, fast heat dissipation; handle the most important is not slippery, lightweight easy to pick up, in line with the hand.

According wok set QFD findings from a new type to prevent hot as the main factor, therefore, consider reducing the heat transfer area, increase the cooling area, insulation materials, etc., to design and development of kitchen supply for elderly user.

This research compiled respondents and expert advice, this study is expected to conclude meet the the improved design of the elderly wok focus as follows(Table 5):

1. The wok heat groove design
2. The wor's bottom has thermal design
3. Addition wok pan edge design to facilitate pouring dish
4. Reduce the force of the weight of the wok support design

- The wok's bottom has thermal display

Table 4 : The design style of wok

| Type 1 | | Type 2 | | Type 3 | |
|---|---|---|--|---|---|
|  |  |  |  |  |  |

5. CONCLUSION

- wok heat trench both beautiful and attainable cooling effect, it is recommended that the cooling rate of the related experiments
- Testing the bottom pan angle and vertical position of the point to get the best position and angle to reduce the force is increased by granting the safety wrist
- Recommended wok beak designed to operate that understanding the most suitable size diameter
- Increase in the bottom of the wok thermal design (such as concave, bumps and vertical angle) that need for the size of the experimental gas stove.

Development new types kitch supply for elderly user was limited by the lack of knowledge and processing technology, and resulting in the concept of output is difficult, so still need help in different areas of professional technicians. In addition, the combination of different materials (e.g., wood and iron), with perhaps another possible starting material for the new design style.

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BIOGRAPHY

- ¹ **Peng-Jyun Liu** live in Taichung Taiwan. She is a Lecturer and also is a student. She works in Asia university and study PhD courses in Institute of Applied Arts, National Chiao Tung University. She has a PhD candidate. Her areas of research is the product design and emotional design.
- ² **Sheng-Houng Lin** live in Taichung Taiwan. He is a Associate Professor and Associate Dean. He works in Asia university. His area of research is the product semantics and emotional design.
- ³ **Jing-yi Wang** live in Taipei Taiwan. She is a Assistant Professor and works in Asia university. She had just engaged in teaching work. Her research areas are ready-made designs and EEG evaluation
- ⁴ **Ming-Chuen Chuang** live in Hsinchu Taiwan. He is a Professor And works in Institute of Applied Arts, National Chiao Tung University. His area of research is Kansei Engineering.