

Implications of the Increase of Single Person Households for High-Tech Industries: Focusing on AI Adopted Products

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1인 가구 증가가 하이테크 산업에서 지니는 함의: 인공지능기술 탑재 상품을 중심으로

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Abstract This study discussed implications of the increase of single person households (SH) for high-tech industries especially focusing on artificial intelligence (AI) adopted products, based on critically reviewing the past researches on their characteristics including consumption trends; the improvement of AI technology; and its market potentiality in various industries. According to the results, SH spent more time with others like friends and neighbors more than couples. Younger people increasingly chose to live alone by their own free will for achieving their goals. 'Living alone' or 'going solo' is not thought negatively any more, but as a new market power in the future. Considering their value oriented consumption behaviors based on spirit of independence and individualism, they will need high-tech products more like AI adopted products than others because of their advantages for the value of single life. Thus, the rapid progress of AI technology is predicted to bring them satisfaction of their wants and it is suggested to prepare for the market segmentation of SH as AI end-users.

Key Words : Single Person Households, Living Alone, Artificial Intelligence, High-Tech Industry, Artificial Intelligence Products

요 약 본 연구에서는 1인 가구의 증가가 하이테크 산업에 미치는 함의에 대하여 특히 인공지능기술 (AI) 탑재 상품(AI탑재 상품)에 초점을 두고 논의하였다. 논의를 위해 1인 가구의 소비 트렌드의 특성, AI 기술의 발전 및 그것이 다양한 산업에서 지니는 잠재력과 관련된 기존 연구들에 대한 비판적인 검토가 이루어졌다. 분석 결과에 의하면, 오늘날의 1인 가구는 남녀 커플가구보다도 친구, 이웃 등과 더 많은 시간을 보낸다. 젊은 계층일수록 자신의 목표를 성취하기 위해 자기 스스로의 의지에 의해 혼자 사는 것을 선택하는 숫자가 점점 증가하고 있다. 이제 '혼자 산다는 것' 또는 '홀로 가는 것(되는 것)'을 더 이상 부정적으로 생각하지 않으며 오히려 미래의 새로운 시장의 파워로 인식되고 있는 것이다. 1인 가구의 독립심 및 개인주의적 사고에 기반한 가치 지향적 소비 행동을 고려하면, 그들은 AI탑재상품과 같은 하이테크 상품이 싱글라이프에 유리한 점을 주기 때문에 다른 가구 유형보다도 더 그러한 상품을 필요로 할 것이다. 따라서, AI 기술의 급진적인 발전으로 인해 1인 가구의 욕구를 만족시켜 줄 것으로 예측되는바, 향후 1인 가구를 AI의 최종 소비자로서 시장 세분화를 준비할 것을 제안한다.

주제어 : 1인 가구, 독신, 인공지능, 하이테크 산업, 인공지능상품

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1. Introduction

Knowledge about the structure of population of the future will make us build up well-organized public policies and learn out what products may be popularized in the market. Due to the global trend of concentrating on the Fourth Industrial Revolution, market managers of Information and Communications Technology (ICT) applied products should prepare for expanding their market share considering the increase of single person households or single households (hereafter SH). Recently, many commercial advertising show that the unusual daily convenience which artificial intelligence (hereafter AI) assistant brings consumers, who look generally singles or living-alone-persons who are not old, but young. And they are described as hard workers to improve their self-esteem. The advertising seem to persuade that the harder you work, you need the AI assistant products more. Although the commercial ads are ordinary, they seem to focus on only AI speakers and don't provide particular and necessary benefits of the AI applied products because the products are not customized yet and have a lot of limitations on individually different consumers' using. Seemingly, marketers depend on the level of technology and are sometimes subordinate to it, instead of cultivating high-tech market based on consumers' data. This may result from lack of the researches on AI application by consumers' perspective. In this regard, it is meaningful to reviewing comparatively and critically the researches of the significant increase of SH and the market expand of ICT applied products, and find the implications for the development of technology and marketing of the future.

Thus, this study reviewed critically the researches on the change of population structure in the future, focusing on the portion of SH and their consumption power that influence on the economy; their possibilities to use AI adopted products and

suggested useful ideas for the development of technology and marketing.

2. Literature Review and Analysis

2.1 Situations and Analysis

2.1.1 The Truth of Increase of Single Households

Living alone seems to have negative meaning in the past and somewhat in present that it was frequently related to poverty, disease, loneliness and social isolation[1,2]. It might be treated, sometimes, as failures in the society. This comes from the results of the researches on single parents or elderly people who were in that situation regardless of their own volition. But, this is not a reality anymore and the results may be different in different contexts and populations due to lack of sound and precise researches[3]. Many researches in the past show that the extraordinary increase of single household or living alone, although the used term is a little different, is very noteworthy for predicting market phenomena of the future. According to a report of Euromonitor International, Fig. 1[4] shows the population of SH is sharply increasing globally, over 2016 through 2030, and the increase rate is going to be higher than any other family types.

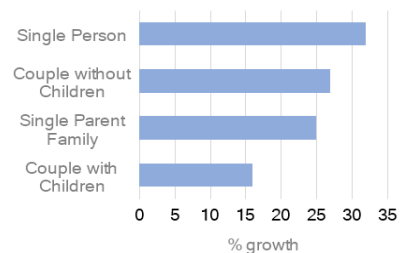


Fig. 1. Global households by family type, 2016~2030

A noteworthy phenomenon is that the increasing rate of younger single households like the growth of elderly group is more than ever before due to their needs for education and careers. The most important fact of these changes is that most people,

especially younger people, tend to live alone by their own choices. They have more economic power than their married counterparts; spending more money for their own lavish individual lives; creating ‘solo culture’; and fueling economy in part. This population structure will deepen in the future of the age of the Fourth Industrial Revolution.

2.1.2. The Present Position of AI Technology

With this trend, there is another issue that attracts our attention, that is ICT such as AI, cloud computing, 3D printing, and robotics which are being realized partly already. They have been researched a lot briskly; the conceptualization of the meaning of AI and the industrial automation that it brought with forming advanced digital and analytical machine learning[5]; implementation of simulation scenarios for providing a client entity for cloud computing systems and its results of the his/her behavior on the performance in the systems[6]; the effectiveness of 3D technologies including printing and scanning generating 3D virtual reality models for cultural heritage and identity[7]; and robotics in healthcare and medical care[8]. They discussed pros and cons about the world which the ICT is bringing[9–11], for example, discussing the risks of artificial intelligence replacing people in heuristic programming[12].

However, more important theme may be to consider who would use actually the technologies most. As mentioned earlier, the portion of SH in the world has been rapidly increasing and about 35% of the total population would be SH in 10 years from now. This means it is necessary to research on the SH as the technology’s end users.

2.2 The Characteristics of SH

2.2.1 Definition and Change of SH

SH is simply defined as living alone households regardless of singletons, divorce, separation by death, leaving home and so on. It is verified by

considering the meaning of ‘a household’, which is composed of all persons who live together in one dwelling[13]. There may be only one person in a household, or more than one who are not related one another. Thus, SH means a household that includes one person. According to a report, living alone persons among Americans, on average, spent more time with others like friends, neighbors and had volunteering group activities in public organizations more than couples[3].

Today, SH shows different features compared with the past. One is that younger people increasingly choose to live alone by their own free will for achieving their goals in the society. The other is that ‘living alone’ or ‘going solo’ has not been thought as negative views any more linking with loneliness, social failure, social isolation and so on. Above this there might be various reasons for the increase of SH as shown in Fig. 2[14].

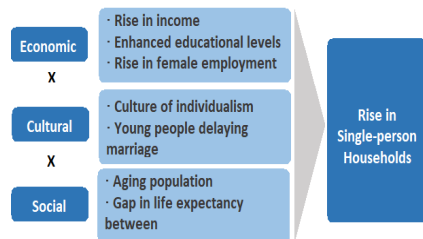


Fig. 2. Factors for the rise of SH

2.2.2. Consumption Trends of SH

First of all, the buying power of SH is shown in food industry as reported in UK[15]. Food product manufacturers have been responding to the increase of SH, by establishing their marketing strategies towards SH such as production of premium single-serving goods, building more convenient selling and buying systems and offering more benefits than bulk discount due to the forecast that the numbers of SH would be one-third of the UK’s population by 2021. They prepare, especially for the increasing younger people who choose to live alone by their own wills and spend

money generously on what they want. As a compelling evidence of this, it was reported that the consequences of living alone were gradually profound in the society and singletons played an important role even though it hadn't been appreciated for invigorating the society and economy[16]. They were more likely to spend on eating out in restaurants, taking classes for self-improvement, enjoying exercise, participating in public issues and volunteering in civic groups than couples. This means that they have more discretionary spending than their coupled counterparts because they have higher income than the past. Thus, corporations began to pay attention to their increasing buying power by releasing many advertisements targeting on SH who wanted to improve their environment[17]. Also, as shown in Fig. 3[14], SH are generally busier living in smaller space than couples, so they need small and compact products with high performance. The prices may not be the real matter with them because they pursue efficiencies of their investment and are respectful of their own satisfactions. They want more physical safety and emotional stability focusing on their selves than any others.

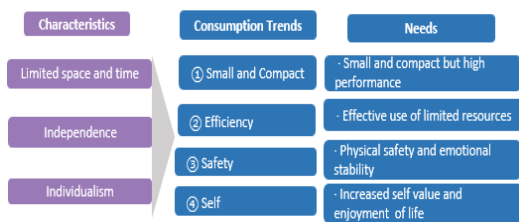


Fig. 3. Characteristics and consumption trends of single households

2.3. The Value of AI Products to SH

2.3.1. Various AI Market Potentiality

Although AI as a term may not be defined coherently yet, the valuation of its market is conceded in various areas. In recent, the researches on its segments and application sectors are actively executed for finding which industries AI adoption

will bring most benefits such as healthcare, automotive, cyber security, e-commerce and customer service and virtual personal assistants[18]. More specifically, Table 1[19] by BCC Research showed the prediction of the smart machines market for 2019–2024 and its market potentiality of the future. It tells that autonomous robots including self-driving vehicles which is reported worldwide are firstly ranked and digital assistants are secondly, which both are very involved in individual consumers' daily lives. This implies that the smart products for individual consumers should be improved for more customized way for maximizing the marketability of AI technology.

Table 1. Forecast share of the smart machine market

Item	Market Share(in millions)
Autonomous Robots (including self-driving vehicles)	31% (3,582-13,927)
Digital Assistants (e.g., Siri, automated online assistants)	30% (2,175-8,075)
Neurocomputers	22% (1,590-4,685)
Expert Systems (e.g., smart grid, medical decision support systems)	12% (7,055-12,433)
Embedded Systems(machine monitoring and control systems)	19% (877-2,095)

2.3.2. AI End-Users in the Future Market

Considering the rapid growth of SH, they would be the core consumers of AI adopted products in the future. SH consumed more electricity, about 55% per capita, than the average four member households since they couldn't share living goods with other family members, but they should have their own[20]. This implies that SH need more helps for their daily living, furthermore sometimes they should do many things at the same time, which means AI adopted products are the solutions in various parts. For instance, the growth rate of smart speaker users is annually 47.9%[21], and the numbers of the users will record over 90 million in the U.S. only in 2018 and the numbers of its users are being diffused fast globally[22]. One of the

advantages of the smart speaker is to be shared by many persons compared to any other smart devices like smartphone or smartwatch. But, the real advantage may be shown in the use of single person who should do many things by himself at the same time without anyone's help. The aggressive market entry of Google with low pricing is a good example to make the market more competitive with targeting its consumers focusing on single persons for making their lives more valuable and convenient.

3. Discussion

3.1. Implications

According to the former analysis, the market trend of the future will be orientated towards SH due to their significant growth rate among consumer population. Thus, market managers cannot but consider them as core consumers. SH are not recognized negatively any more in the society, rather become high-income earners, a symbol of freedom and capable of enjoying self-esteem. Considering their consumption behaviors that pursue small and compact products, efficiency, safety and self-value based on spirit of independence and individualism, it is predicted that they will need tech products more than others because the products have advantages of taking the value of single life due to being connected with PDA(personal digital assistant)[23,24].

This forecast is supported by the results from a research to conduct a questionnaire survey of 180 male and female university students in 2018[25]. The survey questioned the intention of being single person households. The results of 151 valid answers were reported that female students were more likely to live alone than male. Females pursued more self-improvement and saving living expenses; and they considered importantly economic factors, health and safety. On the other hand, male students put emphasis more on family rite standards; and

they answered that living alone would make them feel lonely and unstable. Especially, they were afraid of isolation from their families. However, both of them agreed on that living alone were better in idealizing their own lives than other family types.

Although, in present situations, tech products tend to be used by families which consist of more than two persons, if peering into the inside of the situations, it can be figured that they want to enjoy their own individual lives within their families depending on the smart products. This implies that although high-tech engineers are absorbed in inventing various high-tech applied products as discussed earlier, it is rarely reported that how much they try to understand what for the consumers or end-users of the smart products use. They seem to simply look at superficial change of consumers' using new tech applied products and miss the analysis of what they really need from the products[26].

3.2. Suggestions

It is suggested that the marketing managers related to AI adopted products should dwell on sizing the AI market by concentrating on SH. And the market segmentation of AI end-users is suggested as Table 2, which is modified and reconstructed based on a report by GVR (Grand View Research)[27]. The table implies that key target consumers should be SH in each area. Furthermore, each specific area should be subdivided or mixed to create an entirely new market.

Particularly, four of nine market segments such as retail, advertising & media, automotive & transportation and agriculture may be directly related to consumers in that producers may reach directly their consumers without middlemen. 'Amazon Go' is an example of the specific areas of retail, trade system and distribution system, which

is a grocery where consumers using an Amazon Go app can walk in, buy what they want, like sandwiches, snacks, wine and beer, which are generally small amount of food packages and good for SH, and walk out without any assistant. The store with advanced AI algorithms and camera technology will change selling and buying system, and it must be very convenient for the growth of SH.

Table 2. Suggestions of AI market segments targeting SH

Market Segment	Specific Area
Healthcare	Automated Image Diagnosis/Preliminary Diagnosis/Clinical Trial Participant Identifier/Dosage Error Reduction/Hospital Workflow Management/Virtual Nursing Assistants/Robot Assisted Surgery
BFSI	Investment/Portfolio Management/Financial Analysis/Research Risk Assessment/Others
Law	Legal Consultant
Retail	Trade System/Distribution System
Advertising & Media	Customized Content Production Personal Media Planning
Automotive & Transportation	Reservation System Connecting to other delivery business
Agriculture	Packaging/Distribution System
Manufacturing	Production System/Management
Others	Others

4. Conclusion

According to the results, the rise of SH showed different features compared with the past. They are not poor, sick or isolated from the society any more, but sociable enough to spend more time to converse with friends and neighbors, and have volunteering group activities in public organizations than couples. A truly remarkable phenomenon is younger people increasingly choose to live alone by their own free will for self-improvement. This causes so called 'solo economy' and predicting that they are new market power in the future. AI technology needs to be progressed towards their customized satisfaction

and this should be regarded as an important factor for segmenting AI market for the future.

AI technology is being improved and adopted in various sectors in the society. Regardless of its direction to go forward, eventually AI technology is used for end-consumers who want to solve their problems such as diseases, achieving goals, making money for living, conflicts from human relationships and so on. And they will be dependent on AI adopted products more as smartphone is nowadays a necessity for daily life more than expected. Thus, it is necessary to find out not only what makes consumers use AI adopted products but also who would be the most consumers in the future.

However, it is regrettable that there seems to have not paid much attention to researches on who would be the end-users of AI technology in the past. Thus, for expanding the uses of AI technology, the researches on its end-consumers are needed in the future.

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