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Study on New Architecture Trends for House Design in Korea

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ABSTRACT

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STUDY ON NEW ARCHITECTURE TRENDS FOR HOUSE DESIGN IN KOREA

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Abstract

This study aims at searching the new architectural trends for house design in Korea. It will establish a theoretical basis for changes in habitation behavior and housing patterns responding to the low-childbirth and high technique society. It will research into the population structure and social changes in South Korea and the architectural technical changes for Korean housing through survey analysis. In the end, it will propose the Korean housing design trends and their application technique.

Keywords: New Trends, House Design, Architectural Technical Changes

1. Introduction

Demands for housing types and residential spaces are bound to change along the stream of times. Thanks to the dazzling economic growth after the industrialization in the 1960s, South Korea brought about qualitative improvement in the standard of living. As individuals' life patterns have been diversified, houses suitable for individuals' life patterns have been selected. In particular, population decreases and changes in population structures resulting from low fertility led to the diversification of housing pattern resulting in obvious changes in demand for houses.

As the investment value of apartments that had been regarded to be the best investment targets has dropped due to the slowdown in the real estate market since the financial crisis in 2008, the meaning of housing has been shifted from the targets of investments to true houses where family members make their memories.

Therefore, the purpose of this study is to trace recent changes in house types and residential spaces in order to analyze new trends thereby conducting an a priori study of future houses.

2. Analysis of factors for changes in housing culture

A. Concept and meaning of housing

Whereas houses are physical objects that mean the spaces per se, housing is defined as a place where humans lead their lives as main agents. Therefore, housing is a concept that includes the psychological and cultural aspects formed between the emotional inner side of humans and spaces, which are physical objects.

According to clause 1 of article 2 of the Housing Act, houses refer to all or part of buildings where the members of households can lead independent housing lives for long periods of time and the appurtenant lands and are divided into detached houses and apartment houses.

B. Factors for changes in housing culture

The beginning of housing is the simple shelters prepared by humans to protect their bodies from dangers in nature such as winds, rain, and coldness and attacks by fierce animals. However, as human wisdom developed, needs for housing have been diversified and improved so that housing has been developed into diverse forms of housing as residential spaces for family life units with diverse functions by modern times instead of the concept of simple shelters.

Recent housing culture and forms have been diversely changed according to population structures, industrial structures, urban and regional environments, and demand for house.

(1) Factors for changes in house culture in the aspect of population structures may include population decreases, rapid increases in the elderly, changes in family members, females' advancement into society, and rapid increases in the number of foreigners.

(2) In the aspect of industrial structures, shortening of working hours, increases in leisure time affect changes in housing culture.

(3) Among elements of urban and regional environments, state-of-the-art housing environments, the importance of indoor/outdoor and urban environments, communities, and convenience are included in the factors.

(4) In the aspect of demand for houses, changes in the idea of settlement, decreases in the number of family members, increases in demand for diverse forms of houses, and increases in demand for renewal of buildings affect changes in housing culture.

C. Changes in future populations and population structures

(1) Changes in populations

According to data from the National Statistical Office (NSO),¹ the total population will decrease from 51.01 million in 2015 to 49.02 million in 2065, 50 years later. The population growth rate is expected to switch to negative in 2032 and become -1.03% in 2065. The elderly population is expected to increase from 6.54 million in 2015 to over 10 million in 2025 and to 18.27 million in 2065.

(2) Future household estimation

According to future household estimates² of the NSO, among the ratios of households by

the number of household members in 2015, the ratio of one person households was the highest as 27.2% followed by that of two person households as 26.1%, that of three person households as 21.5%, and that of four person households as 18.8%. However, by 2045, the ratio of one person households is expected to increase to 36.3% followed by that of two person households as 35%, while the ratio of four person households is expected to decrease to 7.4%.

3. Changes in house types in response to changes in population structures

Recent low fertility and changes in population structures have brought about decreases in number of household members, increases in the number of one person households, increases in elderly populations, and the diversification of family structures to greatly affect housing culture and house types. New trends of recent house designs are reviewed as follows.

A. Increases in the preference for detached houses

In South Korea, the ratio of apartments is still shown to be high. According to the 2015 data from the NSO, whereas the ratio of detached house was 24.3%, the ratio of apartments reached approximately 60%. However, unlike the prices of apartments that have been continuously falling, the prices of detached houses and multi-household houses have been rising and the transactions of these houses have been increasing³ indicating that new changes are occurring in the house market. Recently, the Korea Research Institute for Human Settlements surveyed houses where people were currently residing and houses where people wanted to reside in future in comparison with each other from 1590 people and according to the results, although 64.1% of the respondents were currently residing in apartments, only 28.7% of the respondents wanted to reside in apartments 30 years later. On the other hand, whereas

¹ National Statistical Office, future population estimate:2015-2065, 2016.12

² National Statistical Office, future household estimate:2015-2045, 2017.4

³ KB Financial Group Inc., management research report, 2012.

the ratio of the respondents currently residing in detached houses was 14.7%, the ratio of those that wanted to reside in detached houses was high as 41% indicating that preference for detached house will gradually increase.

B. Preference for small scale houses and increases in elderly persons' town house⁴

As populations have decreased and households have been divided due to the effects of low fertility, the number of one person or two person households has been increasing and demand for small house has been maintained. In particular, one person households residing in downtown areas are highly likely to choose small rental houses because they are low in age and income. Therefore, the development of a variety of small-sized urban multi-family houses mainly in the metropolitan area and metropolises is becoming an alternative.

Recent sociodemographic characteristics can be said to be countermeasures against increases in elderly populations. In 2013, the proportion of populations aged 65 years or older in South Korea was close to 14%, which is the criterion for aged society, and it is expected to exceed 20% in 2026 so that South Korea would become a super high aged society⁵. Town houses are charged housing complexes that are equipped with complex facilities such as facilities and service functions necessary for the elderly and provide a variety of living services. Town houses are equipped with composite facility complexes dedicated to the elderly including diverse service functions such as recreational facilities, hospitals for the elderly and elderly communities. Recently, town houses have been increasing mainly in

the metropolitan areas such as the silver town houses in Geumgok-dong, Bundang-gu, Seongnam-si.

C. Increases in prefabricated houses

With the decrease in the number of family members, along with reduction of house sizes, the number of consumers who prefer prefabricated houses made utilizing wood and containers is rapidly increasing. Since prefabricated houses not only can be freely moved to other places but also enable the reutilization of 80% of the facilities, they reflect the recent trend of housing that is switching from the existing concept of housing, which is something to be owned by buying it, to a new concept of housing, which is a place where people live.

Wooden houses with light weight wood framing systems have already been recognized as environment-friendly houses in advanced countries such as Europe because these houses provide good environments to people with atopy or weak immunity as humidity can be controlled in these houses because of the nature of wood. According to the Korea Agency for Infrastructure Technology Advancement, the prefabricated house construction market is expected to grow from KRW150billion in 2012 to KRW940-1,700 billion in 2020.

D. Emergence of diverse forms of houses

(1) Share House

Following the decrease in the number of family members and the changes in population structures, house types are being diversified. Share houses are a type of housing where many people live in one residential space. That is, while private spaces such as bedrooms are used separately, the living room, toilet, and kitchen are shared. Share houses are a sort of jointly owned and shared houses, and there are other similar types of jointly owned houses named such as collective houses, group house, and cooperative houses. Recently, the diversification of house progressed further from housing

⁴ Yoon Min-Woo and four others, A Study on Changes in the Housing Market and Future Housing Types, Korea Institute of Construction Engineering and Management, collection of papers presented in conferences, 2012.11, pp.257-280

⁵ Gyeon Jin-Hyeon and one another, A Study on the Urban Elderly Welfare Housing linked to Services to prepare the Super-Aged Society by Baby Boomers, Journal of the Architectural Institute of Korea vol. 18, no. 5, 2016, pp.45-54.

communities and houses have been diversified into forms of houses where people with the same areas of interest such as dilettante life live together.

(2) Ddang-kong House⁶

The ddang-kong home house is a house system in which buildings where two households can live in one lot of land and the yard is shared. Two households jointly buy a lot of land and build buildings of two households side by side. It is also called duplex home or duplex house.



Figure 1. An example of duplex homes in South Korea

4. Increases in environment friendly sustainable houses

A. Increases in zero energy houses

A zero energy house is defined as a house that minimizes the energy load required for buildings and minimizes energy consumption by utilizing new energy and renewable energy.⁷ Zero energy houses refer to houses where energy consumption is reduced compared to existing house complexes using passive design technologies and at least a certain level of the energy consumption is supplied using active technologies so that the yearly total energy balance is maintained at '0' or higher (The produced amount of energy exceeds the energy consumption).

⁶ Lee Yun-Ji, A Study on the Floorplan Types and Characteristics of "Ddang-kong House" in Korea, Thesis(master) of Seoul National University, 2012.

⁷ Clause 4 of article 2 of the Green Building Formation Support Act



Figure 2. Conceptual diagram of zero energy houses

B. Emergence of net zero energy houses

The net zero energy house means a zero energy house into which a system that enables the selling and buying of electricity remaining after use in the maintenance of the building out of the energy produced by utilizing new and renewable energy was introduced.



Figure 3. Concept of Net Zero energy building

C. Forest influence area house

The forest influence area house means a house focused on 'comfort' that enables taking a rest while enjoying nearby green areas, parks, and mountains. In the recent situation where the basic trend of low growth of domestic economy has been prolonged, daily lives are under pressure, and many things are modernized, the nature and resting spaces, which cannot be replaced by anything else in everyday life, are more preferred. Forest influence area houses will be the most important factor to be considered in future housing options. In particular, retirement preparers are choosing

'forest influence area' houses as a way to enjoy nature and leisure at low cost.

5. Increases in smart houses utilizing IT technology

South Korea is an IT powerhouse with high-speed internet infrastructures, which have been better prepared compared to the economic scale, and the high internet penetration rate that are ahead of other countries. The house construction market utilizing this IT technology is gradually growing bigger.

A. Emergence of services utilizing the Internet of Things (IoT).

This is a service that provides devices and services to increase the convenience of the family and enable safe and enjoyable life by fusing all electronic devices in the house with the Internet of Things (IoT). The IoT refers to intelligent networking technologies and environments in which surrounding things are connected to wired and wireless networks so that they interact with each other while organically collecting and sharing information. This is a newest Internet technology that enables communication between people and between things any time anywhere by connecting things in the real world with the virtual world with each other through networks.

For the IoT to be applied to houses, four conditions are necessary; ① sensor attached devices (smart devices) that can sense data being generated such as temperatures, humidity, movements, and environments, ② wired and wireless communication environments that enable communication with things and the transmission of collected data to cloud ③ a Basic Platform that enables exchanges of generated data, ④ big data that can provide solutions for transmitted data.

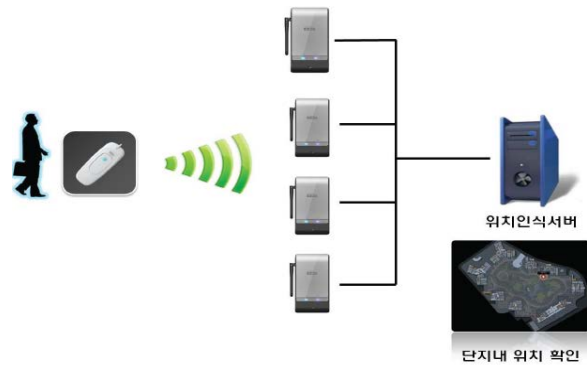


Figure 4. Apartment positioning system

B. Smart home platform function

The smart home platform is a platform configured to enable interlocking between humans and things and between things and things by interconnecting the devices installed at home through networks in order to provide personalized services.

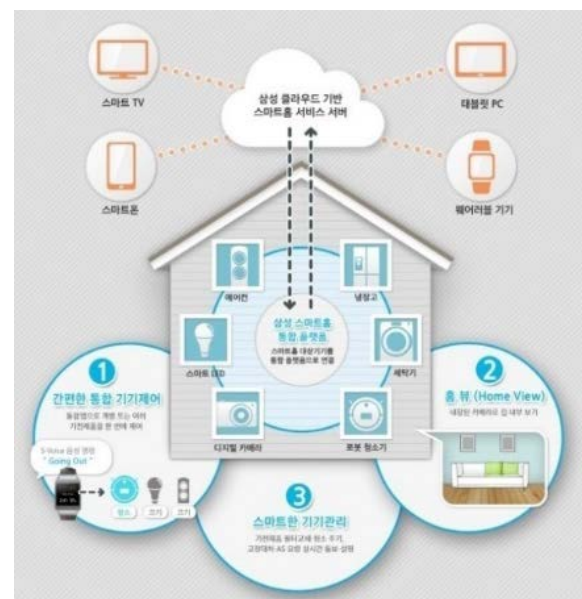


Figure 5. SAMSUNG smart home platform system

C. Diffusion of personalized smart services

Personalized services in houses are systems that provide personalized services by sharing user information with diverse smart devices at home - smart TV, PC, audio, game device, and temperature control system with the user's smartphone. With the diffusion of smartphones, personalized smart services are spreading.

6. Conclusion

The purpose of this study is to analyze the social, economic and sociodemographic factors that affect house culture and to trace the new trend of recent house design.

This study set changes in populations and the forms of households, nature-friendly living culture, and the development of IT technology as factors that have the greatest effects on recent South Korean house designs. Following the changes in population structures, preference for detached houses and small scale houses, increases in houses for the elderly and prefabricated houses, and the emergence of diverse houses (share house, Ddang-kong house, etc.) were identified through investigation.

The diffusion of environment-friendly culture can be seen in new house trends such as increases in zero energy houses, the emergence of net zero energy houses, and forest influence area houses, etc. Finally, advances in IT technology are adding new technical elements to house equipment. For example, equipment systems utilizing the Internet of things, the spread of Internet-enabled equipment, smart home platforms, and personalized smart services will be diffused so that houses gradually become smart and performance as devices will be required from houses hereafter.

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