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Research on the Application of BIM Technology in Planning Space Design of Home-based Aged-care Community

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Abstract: *Under the general trend of increasingly serious population aging, BIM technology is used to support the application of new technologies, ideas and models for the aged-care space. This paper analyzes the application strategy of BIM technology in the planning space design research of home-based aged-care community in order to promote the scientific development of the aged-care space construction activities and analyze and expound the key links.*

Keywords: *BIM technology, Aging-suitable transformation, System, Application module, Database*

1. Investigation on the Current Situation of Planning Space Design of Home-based Aged-care Community at Home and Abroad

1.1. Current Situation Abroad

From the survey of community aged-care abroad, the United States and Canada have accumulated a lot of constructive experience in the rich community service for the aged for decades. Whether it is the construction of spatial planning of home-based aged-care community, the concept followed in the construction, humanistic care, high-quality service, entertainment planning and other aspects of experience and practice are worth appreciating.

(1) The social aged-care service system is sound: The diversified pattern created by the national government and relevant laws and regulations, aged-care community managers, social family members, the aged themselves and other social people not only provides high-quality service concepts, but also offers abundant financial support, which ensures the sustainable development of the home-based aged-care community.

(2) The concept of community construction meets the needs of the aged: According to the investigation, the common characteristics of the four different aged communities are spacious and pleasant public areas, clean and bright leisure and entertainment spaces, complete internal functions of living spaces and standardized safety facilities.

(3) Professional quality of community home-based aged-care service personnel: The staff take care of the aged's daily life in every possible way from food, clothing, housing and transportation to spiritual needs, which makes the aged a real feeling of home.

(4) Community quality service makes the aged worry-free: The aged-care community itself is equipped with professional medical staff to stand by 24 hours a day in the duty room, and check the daily physical condition of the aged in daily life. What's more, it has a direct and intimate relationship with neighboring hospitals, so as to facilitate timely arrival and rescue of critical situations.

(5) The rich recreational activities in the aged-care community meet the spiritual needs of the aged: The aged-care community has interesting activities such as community organizations, public welfare publicity, interest courses, etc., which attract them to do some events to enhance their self-worth and achieve spiritual enrichment.

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1.2. Domestic Status

In today's China, the problem of population aging is becoming more and more serious, and the problem of providing for the aged is becoming increasingly prominent. The traditional home-based aged-care model is increasingly becoming a burden for ordinary families. Therefore, as shown in the following figure, the new aged-care model "home-based care for the aged + community-based care for the aged" becomes the future development trend. (65 years old is the dividing line)

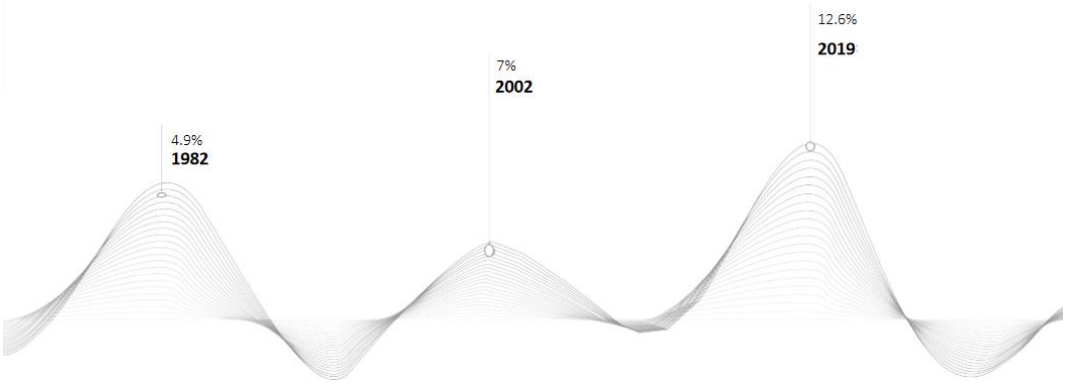

Figure 1: Development trend of population aging

Through market research, it is found that 46.4% of the aged hope to be a comfortable and pleasant aged-care community model that is not too large; 32.4% of the aged hope to be small and medium-sized aged communities, which are convenient for living and management.

As for the choice of aged-care, 33.60% of the aged choose to live in the same community with their children but live separately; 17.8% of the aged want to live in a familiar environment; 14.8% of the aged want to live with their children or live in high-end aged communities that can enjoy professional services; Only 7.1% of the aged want to live in welfare facilities such as nursing homes.

It can be seen from the investigation that most of the aged prefer to live in their familiar life circle and are community-based models. Most of the nursing homes are separate courtyards independent of the community, and they are more inclined to live in the aged who lack self-care ability. Compared with most of the aged, the new aged-care community is the most suitable for the aged to carry out aging-suitable transformation and newly planned aged-care community.

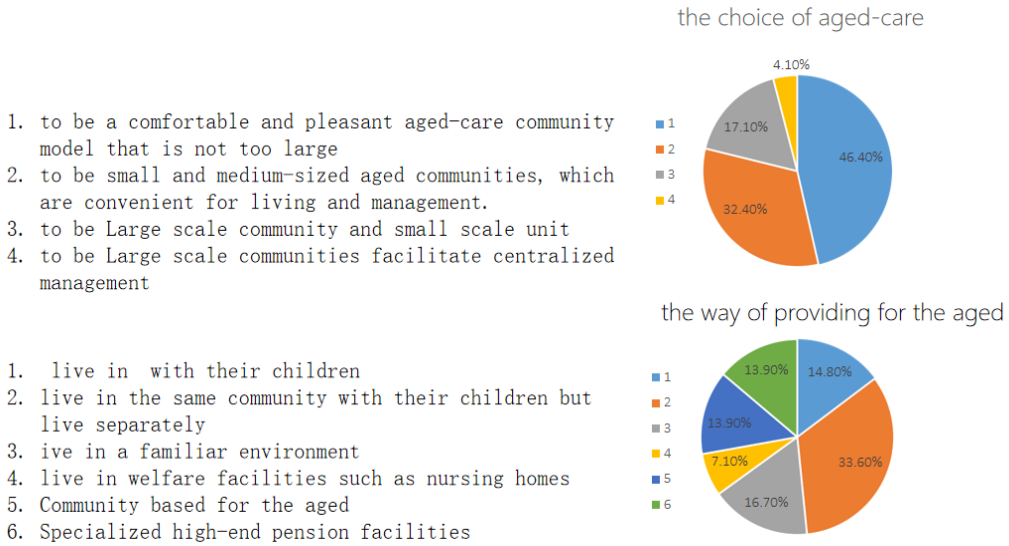

Figure 2: Model of aged facilities and market research chart of aged-care methods

2. New Planning Module of Aged-Care Community

(1) Coordinate planning. BIM technology is used to establish BIM cloud platform. The problems

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encountered by designers in design that need to be solved by many parties are put into BIM cloud platform. After sharing information in real time, multi-party personnel conduct in-depth communication and analysis, and then use BIM cloud platform to share it with workers and designers on the construction site for design adjustment.

(2) Suitable for aging transformation. BIM technology can also be used to study and analyze indoor and outdoor lighting and ventilation. In the early stage of design, technology is used to replace the aged to consider problems, and the design process can be more humanized and multi-angle. For the aged with inconvenient legs and feet, it is necessary to minimize the walking distance, especially the distance from the aged with inconvenient mobility to the bathroom, stairs and uphill. Through the construction of barrier-free facilities in Revit Family Library, the most reasonable barrier-free transformation can be carried out indoors and outdoors through BIM technology, so that the aged can move more safely. For current situation, most communities have unreasonable interior space design, such as wheelchair ramps and the openness of indoor doors in wheelchair families; Height and series of steps up and down stairs; Reasonable handrail height and elevator button height in elevator room; Barrier-free facilities for the aged and the disabled, such as indoor corridors. Therefore, BIM technology is used to combine the activity characteristics of the aged and the disabled and the design requirements of barrier-free facilities. The irrationality in the existing design is analyzed according to the current requirements. In order to provide protection for the maximum convenience of the aged, we can ensure that the aged can devote themselves to community activities and maintain physical and mental pleasure

At the same time, BIM technology can solve the osteoporosis problem existing in most aged people (sun relief). BIM model can be used to study the daylight path of the community, and reasonable public activity places can be designed for the aged according to the differences of sunshine and seasons in different regions. For example, it is used as a park in a place where there is plenty during the day to facilitate the aged to fight and spread daily; In the afternoon, choose a cooler area as a place for the aged to drink tea and play chess to establish a pavilion; In the evening, the area with good wind direction and early downhill is generally selected to open up an open space as a dancing place for square dance and set up sports equipment nearby.

(3) Complete design system. With the serious homogenization of products, service has become an important fulcrum to get out of differentiation. In terms of design services, design is the entrance of maximum flow and the standard of decoration. Good design means passenger flow, transaction and efficiency. In terms of system services, it is necessary to start with important nodes such as customer ordering, production, delivery, installation and after-sales, analyze the aspects that can be improved, and create the ultimate service experience and standards in the whole life cycle.

BIM technology is used to integrate the whole process of spatial planning, landscape design, hard-fitting and soft-fitting of the whole aged-care community. Integrate BIM customized drawing, BIM design, BIM 3D visualization, BIM modeling research, BIM cloud platform and other functions to provide design services. BIM design system can realize one-click design of floor plan, BIM technology can automatically and intelligently complete the design scheme, and realize the return of multiple design schemes in a few minutes. BIM Design cooperates with many design companies, and has a variety of intelligent home improvement schemes to match with its apartment type, accurately model, avoid blind spots in design, communicate online in real time 24 hours a day, and quickly grasp the characteristics of customers so that customers can experience immersive design. BIM three-dimensional visualization system allows customers to observe the panoramic model of the scheme, and find their dissatisfaction in the design stage to avoid the problem that it is difficult to modify the deficiencies found in the construction period. BIM modeling research system is designed to solve these problems by simulating illumination, wind direction, ventilation and other customer concerns, so as to better serve customers and truly achieve what you see is what you get. BIM cloud platform system is convenient for many people to share their own information in real time, and truly achieve convenient communication.

It is more intelligent and rational to use the multiple functions of the self-contained design system to plan the space design of the home-based aged-care community compared with the common ones. First of all, BIM design is used to generate a variety of different spatial planning and home improvement design, and the advantages of each set of spatial planning are analyzed and integrated. Secondly, the use of BIM modeling research to test the irrationality of the design drawings or worthy of improvement and develop deeper details.

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3. Conclusions

Aiming at the research on the planning space design of the aging home-based aged-care community, the aged-care model and adjustment mode in China are constantly improving and applying, but there are still many problems in the transformation of the aged-care community. The use of BIM technology design system for the aged-care community space planning rationalization design in the use of BIM technology modeling research system for the depth level of detail inspection of the design drawings.

References

[1] Weixin Jia., Research on the Management of Smart Community Pension Based on BIM
[2] Xie Jiajin; Jun-mei zhang; Zhu preservation; Li Shenglai; Yang palm method; Xie Hui; Qing-shan xu; Wang; Liu Yinkun; Investigation Report on Community Elderly Care in the United States and Canada; Property Management in China, 12th issue, 2012
[3] Taoke Baba; Research on the Management of Elderly Care in Smart Community Based on BIM; "Web Page"
[4] BIM Technology Enables the Digital Transformation of Construction Industry; architecture
[5] Study on the Evaluation System of Smart Elderly Community; Web Page