Assessment of Residential Satisfaction and Influence Mechanism

——A Case Study of Jinan City

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Abstract

Residential satisfaction reflects to what extent the consumers are satisfied with the construction of residential environment, and hence is an important factor of housing purchase determination. 303 reliable survey questionnaires by means of quota sampling preformed in 5 districts of Jinan city are used to investigate the satisfaction with the new residential conditions of this city. By means of factor analysis and regression analysis, we establish the index system of residential environment satisfaction suitable for Jinan, to quantitatively determine the satisfaction of the consumers with new housing, and to explore the underlying factors affecting residential satisfaction. Five category factors including: housing physical condition, public facilities, location, property service and corporate image have significant impacts on residential satisfaction. Among the factors, the public facilities such as schools and supermarkets are the main factors affecting the residential satisfaction. At last, a multiple linear regression model of residential satisfaction was set up and elaborated the influence mechanism of the impact of various factors on residential satisfaction, which presents a robust relationship between residential satisfaction and the related controlling factors.

Keywords: residential satisfaction, evaluation system, influence mechanism

1. Introduction

Before the reform of the housing system in China, consumer demands for housing are only on quantity. In recent years, with the large improvements in the new commercial housing, consumers have gradually raised the requirements for housing performance and quality. The grade of residential satisfaction has become a vitally important indicator of housing purchase determination. Therefore, customer residential satisfaction, which reflects the degree of the satisfaction of the customers with residential environment, has been a major concern of recent studies (Victoria, 2006; Mohit M A.et al. 2010). They mainly focus on factors influencing residential satisfaction including the user characteristics, the housing physical condition, and the social space state (Salleh A G., 2008; Parkes A.et al. 2002, Li & Wang ,2014). Among the factors, some scholars believed that the construction quality, unit design, location advantage, property services, public facilities, real estate developer, environment, neighborhood relationship have a certain impact on residential satisfaction degree (Ren & Chen, 2010; Fu, 2000; Wu & Chen, 2013; Du, 2002). Yu Xiaofen pointed out that admission into the nearest school can improve the environment satisfaction of residents, and the satisfaction of renters is lower than that of the owners (Yu & Xiao, 2010). Researchers studied satisfaction for different types of residential communities, such as subsidized housing, affordable housing, elderly housing, own rental housing and urban village housing. New residential community is different from old (Li & Wang, 2014; He& Qi, 2014; Ding & Jiang, 2014). Zhu Yan constructed residential satisfaction model (Zhu & Li, 2003). Based on the enterprise, Zhang designed a residential satisfaction measurement scale (Dong & Yang, 2007). Dong and Yang introduced the real estate corporate image variables in the design of residential satisfaction model (Zhang, 2008). Most scholars constructed satisfaction evaluation index system in different cities and different regions, and then carried on the empirical analysis (Li, 2003; Chen, 2011; Wen & Zhou, 2012). In addition, the establishment of evaluation index and the empirical evaluation has been performed (He & Zhang, 2011).

The study shows that the situation and the influence factors of residential satisfaction in different regions and different economic development stages are different. The evaluation index system has a certain relationship with

regional characteristics and residential development stage. However, these studies pay more attention to examining of the satisfaction, but lack the influence mechanism evaluation.

Jinan City is the capital and the hub of transport and communication network of Shandong province. Located at western Shandong Province, East China, it possesses a special geographical feature, which is a mixture of mountains, springs, lakes, and rivers, and is also known as a tourist and cultural-historic city. It administers 6 districts, i.e., Licheng, Lixia, Shizhong, Huaiying, Tianqiao and Changqing District. Because of its advantage in locations, tour, transport, culture and so on, the housing market of Jinan has been developing rapidly since the China's housing system reform in 1998, and meanwhile the home ownership rate is increasing continuously. In Jinan, the housing demand is mainly in owning homes, while the housing investment demand has been decreased. In 2016, the total commercial housing turnover of five districts was 1.971×10^7 m^2, and the average deal price was 9620 yuan m^{-2}.

The object of this paper is to take Jinan as a case to evaluate the degree of satisfaction of the new residential community in recent three years, and then to explore the influence mechanism.
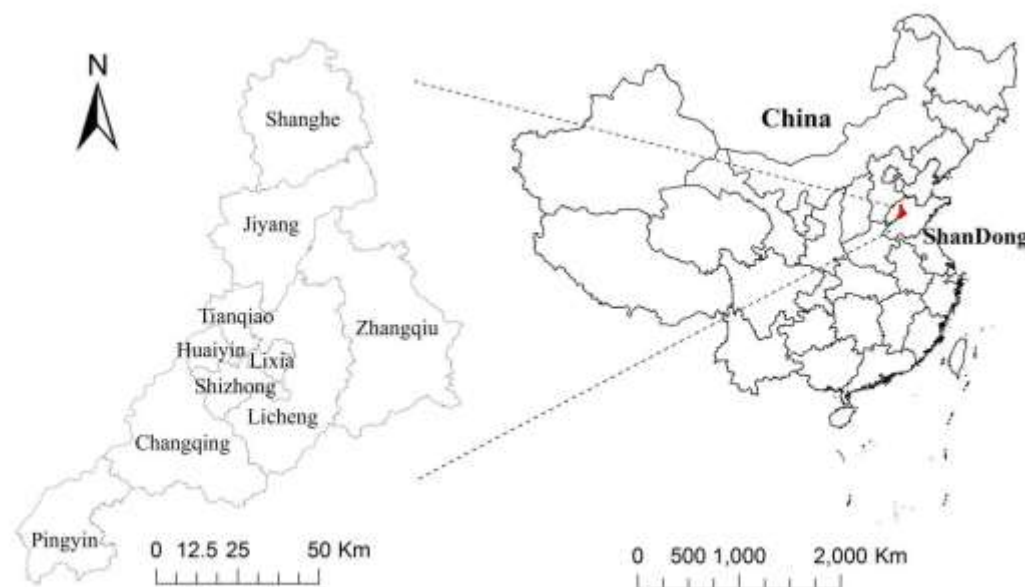

Figure 1. Location of the study area

2. Data and Methods

2.1 Questionnaire Design

Questionnaire consists of subjective and objective questions. Subjective questions have 35 problems in terms of the housing physical condition, public facility, property service, corporate image, etc. These problems are evaluated by means of Likert scale, in which 1 stands for "very dissatisfied", 2 stands for "dissatisfied", 3 stands for "average", 4 stands for "satisfied" and 5 stands for "very satisfied". Objective questions have 10 problems in terms of self-characteristics of the participants and the basic situation of community. 303 of 325 questionnaires in this survey are considered as be effective. The questionnaire is evenly distributed over the five districts of Jinan City, i.e., LiXia district, ShiZhong district, HuaiYin district, LiCheng district, and TianQiao district, which provides the basic information on residential satisfaction of customers who live in residential district in 2014-2016.

2.2 Residential Satisfaction Evaluation

All indicators related to residential satisfaction are compiled. Through consulting relevant experts, home buyers and real estate practitioners, 35criteria are filtered to establish a residential satisfaction evaluation index system, which is shown in Figure 2. The system has six subsystems, i.e., housing physical condition, public facility, location, property service, the value judgment and the corporate image factors. Each subsystem is determined by 3-9 particular criteria.
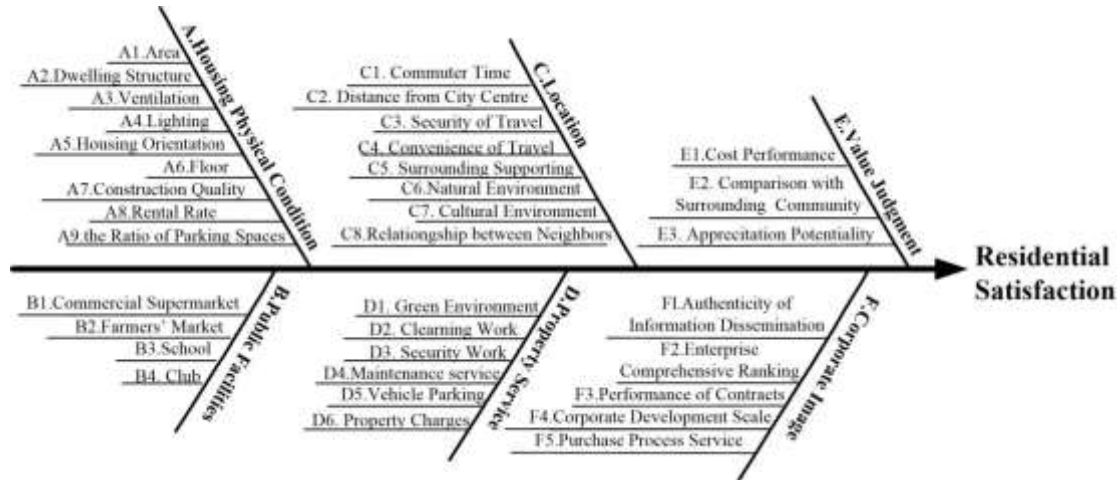
Figure 2. The index system of residential satisfaction evaluation

Firstly, statistical procedures of factorial validity and confirmatory factor analysis are used to assess the reliability of the questionnaire using SPSS software. Then, preliminary indicator information is obtained through descriptive statistics, and correlation analysis is applied to detect the impact of real estate group on satisfaction and identify the main factors controlling the degree of satisfaction. Finally, to explore influencing mechanism of residential satisfaction, a multiple linear regression model is established based on the indicators.

3. Results and Discussions

3.1 Residential Satisfaction

The total residential satisfaction in Jinan city is 3.52, i.e., between "average" and "satisfied". "Given that the threshold satisfaction of 3.5 (Mohammad Abdul Mohit & Al-Khanbashi Adel Mahfoud, 2015), the residential satisfaction in Jinan can be considered to be satisfied. Based on this, we think the dwellers are basically satisfied with the residential conditions. Because the score does not reach the scale of "very satisfied", the potential development is still required.

The residential satisfaction in Jinan varies from one district to another. The lowest and highest satisfaction scores are Tianqiao District (3.2390), northern Jinan city, and Lixia District (3.7302), eastern Jinan, respectively. The other districts have the score values between 3.2857 and 3.625 (Fig3). In general, the satisfaction in eastern and southern regions of this city is high, while the northern and western regions is lower. This is consistent with the habit of housing consumption in Jinan, living in southern and eastern regions instead of northern and western regions. The high satisfaction at the south of Jinan can be related to beautiful natural environment from a lot of mountains and forests. Besides, many universities, research institutions and high-tech enterprises are located in the well-developed eastern regions, which contribute much to the high satisfaction score value in the region. Lagged socio-economic development may confine the residential satisfaction in the north of Jinan. These suggest that the residential satisfaction in Jinan is highly influenced by natural environment, economic development, humanistic quality and consumption habits.
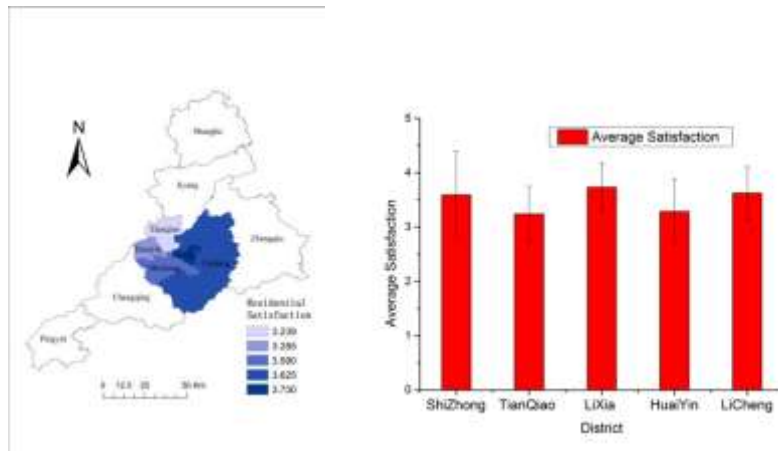
Figure 3. The differences of residential satisfaction in Jinan

The value averaged by 35 controlling factors in the questionnaire is less than 4, implying that all the factors are under the "satisfied" scale (Fig.4.)It can be seen clearly that authenticity of information dissemination, maintenance service, school, the ratio of parking spaces, property charges, vehicle parking, construction quality are below "average satisfied" scale. Because the seven indicators are closely related to real estate developers, satisfaction score will be improved much if the developers draw attention to consumer demands, construction quality, parking spaces, property services.

The most satisfying factor is the housing orientation and the most dissatisfied one is the construction quality, respectively, as shown in Figure 4. One possible reason is that facing south is a living habit deeply impressed in consumers. Furthermore, developers sufficiently take lighting and ventilation into account. Therefore, orientation becomes an important controlling factor of residential satisfaction. Among the 35 factors, construction quality has the lowest satisfaction score value of 2.669. Inhabitants often complain about the quality of construction. More attention on the quality of construction should therefore be paid by the real estate developers.
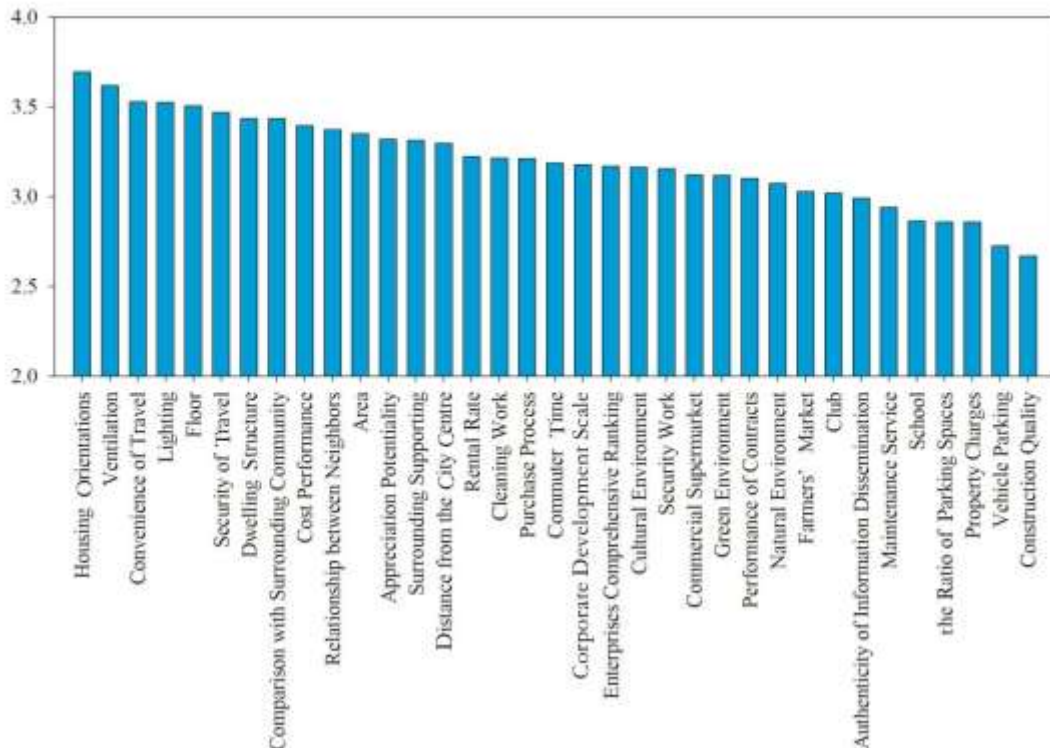

Figure 4. The ranking of factors affecting residential satisfaction in Jinan

The residential satisfaction of different consumer groups is distinct. The consumer group with higher residential satisfaction is 36-40 years old, civil servant, local urban residence, nuclear family and high income. The consumer group with lower satisfaction score is usually 26-30 years old，company employee or worker, nonlocal rural residence and family of 3 generations. The female has a slightly higher residential satisfaction degree than male, possibly promising the easier satisfaction of female. There is almost no discrepancy among the consumers with the monthly family income between 2000 yuan to 10000 yuan. The lower income group usually has lower expectation, while higher income group is opposite. This may result in the almost same satisfaction rate. However, the higher income group usually has relatively higher satisfaction rate.

3.2 The Establishment of the Index System of Housing Satisfaction

Factorial Validity and Confirmatory Factor Analysis is used to assess the reliability of the questionnaire, and the criterion is the internal consistency coefficient (Cronbach's Alpha value), and higher Cronbach's Alpha value means higher reliability of the questionnaire. The high standardized Cronbach's Alpha value (0.924) suggests that our questionnaire is highly reliable. A robust relationship between residential satisfaction and the housing physical conditions, public facilities, location, property service, value judgment, and the corporate image is constructed based on the hypotheses that all the factors, i.e., Housing Physical Condition, Public Facilities Location，Property Service，Value Judgment and Corporate image have significantly positive effects on the residential satisfaction.

Table 1. Common factor reliability analysis

common factor	Cronbach's Alpha	Standardized Cronbach's Alpha	The number of variables
Housing Physical Condition	0.824	0.827	9
Public Facilities	0.734	0.738	4
Location	0.823	0.823	8
Property Service	0.884	0.885	6
Value Judgment	0.693	0.699	3
Corporate Image	0.849	0.850	5

As Table 1 shown, the standardized Cronbach's Alpha value (internal consistency coefficient) of the value judgment is 0.699, indicating that the reliability level of value judgment is general. While the standard Alpha Cronbach's value (internal consistency coefficient) of the rest common factors are all more than 0.7, indicating that the reliability of the data is generally high and the common factors are explained well by the variables. Though the value judgment factor is not explained well by the variables, it can be further studied.

The Bartlett's ball test and KMO sample test show that our indexes are suitable for the confirmatory factor analysis, with the KMO coefficient of 0.854, and the significance level (p) of 0, Fig.5.
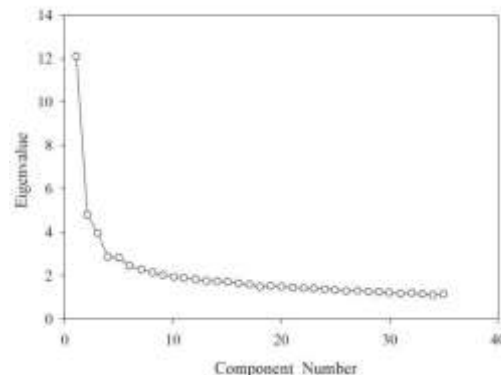

Figure 5. Factor analysis screen plot

According to the criterion of filtering factors proposed by Kaiser(reference), five common factors were left using the factor analysis, including property service, location, housing physical condition, corporate image, public facilities. The removing of the value judgement indicates that the influence of value judgment has decreased for consumers who have purchased houses. After purchasing they will not care about price, but the experience and the appreciation space. Thus, the evaluation index system of Jinan residential satisfaction was established as shown in Fig.6.
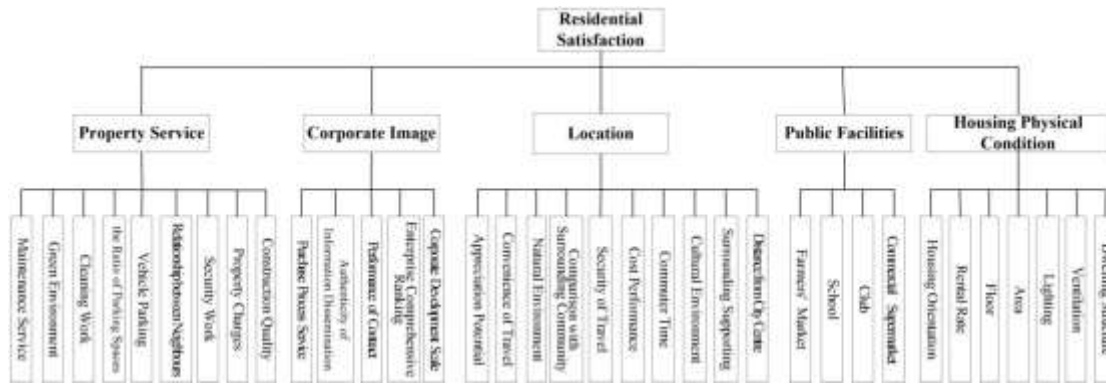
Figure 6. The index system of residential satisfaction

The index system of residential satisfaction includes five parts: corporate image; property service; location; public facilities and housing physical condition.

Corporate image refers to people's general impression of the real estate enterprise which is based on the service provided by the enterprise and the information released by it, like enterprise comprehensive ranking, corporate development scale, performance of contract, authenticity of information dissemination, purchase process service.

Property service is a service provided by the real estate enterprise after residential buyers moving into the new houses，it is to make homeowners live more comfortably here and prolong the usage period of the house .This service mainly includes maintenance service, green environment, cleaning work, ratio of parking space, vehicle parking, relationship between neighbours, security work, property charges, construction quality.

Location refers to a relationship between the house and other houses or things in space and distance, including appreciation potential, convenience of travel,natural environment, comparison with surrounding community, security of travel, cost performance, commuter time, cultural environment, surrounding support, distance from city centre.

Public facilities refer to the infrastructure of the house and the public service facilities, such as commercial supermarket, farm's market, school and club.

Housing physical condition refers to the characteristics of house entities, like housing orientation, rental rate, floor, area.

3.3 A multiple linear regression model of residential satisfaction degree

The category factors influencing satisfaction degree include property service, location, housing physical condition, corporate image and public facilities. Thus, the multiple linear regression model of residential satisfaction can be proposed as:

$$Y_1 = const + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + Ui$$

where$Y_1$is residential satisfaction degree, const is the constant, Ui is the interference,$X_1,X_2,X_3,X_4,X_5$are housing physical conditions, public facilities, location, property services and corporate image respectively, and β_1, β_2, β_3, β_4, $\beta_5$are the parameters of the independent variables.

This model can account for 78.1% of residual satisfaction spatial variance. The regression coefficients of the five independent variables are significantly different from zero. These suggest the regression relationship between the five independent variables and the dependent variable are reasonable.

Table 2. Results of multiple linear regression analysis of residential satisfaction

Model	Non-standardized coefficients		standardized coefficients	t	Sig.
	B	Std	Beta		
Con	3.531	0.028		125.476	0.000
Housing physical condition	0.195	0.028	0.333	6.921	0.000
Public Facilities	0.222	0.028	0.378	7.861	0.000
Location	0.157	0.028	0.097	2.015	0.000
Property Service	0.197	0.028	0.336	6.991	0.000
Corporate Image	0.127	0.028	0.216	4.489	0.000

Regression constant is 3.531, the regression coefficient of X_1, X_2, X_3, X_4, X_5 is 0.195, 0.222, 0.157, 0.197 and 0.127 respectively. Thus, the regression equation of the residential satisfaction degree in Jinan can be represented as:

$$Y_1 = 3.531 + 0.195X_1 + 0.222X_2 + 0.157X_3 + 0.197X_4 + 0.127X_5$$

Consequently, the influencing factors of residential satisfaction can be ranked by impact extent as: public facilities (0.222), property services (0.197), housing physical condition (0.195), location (0.157), corporate image (0.127).The figures above show the importance of public facilities. With the improvement of living standard, people care more about their quality of life, and traffic convenience and housing comfort have been significant factors affecting housing satisfaction rate. Consumers not only need a certain living space, but also want to have complete supporting facilities, such as schools, hospitals, supermarkets, fitness and cultural entertainment facilities, so as to reduce the time and physical costs of life and entertainment. In recent years, public facilities are becoming increasingly important. The school district housing in Jinan gains more attention which proves this. Besides, housing is not fast-moving consumer goods, and human beings will live in it for several decades, so they hope to live at ease and comfortably. Therefore, customers emphasize more on the property services, housing physical condition and the corporate image. Meanwhile, good property services directly affect the housing appreciation, and also can improve the convenience of life.

4. Conclusions

This study quantifies the residential satisfaction and its influencing mechanism through the questionnaires about urban housing in Jinan. Although the satisfaction rate varies from one region to another, the high satisfaction occurs in the southern and eastern region. The different consumers' satisfaction is distinct resulting from public facilities, property service, housing physical conditions, location and the corporate image. The dominant factor is the public facilities. A new index system of the housing residential satisfaction evaluation is established through Jinan regional discrepancy. Residential satisfaction assessment is established to quantitatively analyze the relationship between residential satisfaction and the impact factors.

Many efforts should be made by China government to highly improve the residential satisfaction score. They should pay much more attention to the construction of the public facilities in the community and make further promotion in the equalization of public facilities, especially the education of primary and secondary schools. It is also necessary to eliminate the idea of "the school district", and gradually, try to make the neighborhood school accessible and narrow the differences in school education resources. The government should strengthen the supervision of the real estate development. The unqualified housing is forbidden. Developers who are complained about repetitiously should be blacklisted.

The real estate developers also have responsibility for the increase in the residential satisfaction score. In order to highlight the practicability, convenience and comfort of living, they need to pay attention to the construction and design of property quality, and strengthen the construction of community life facility, such as supermarkets, kindergarten and clubs. Property service is the key factor of the housing continued-appreciation. It requires developers to choose the property service company carefully before the housing completion. The property service company should have better reputation and management experience.

To improve the residential satisfaction and loyalty, the developers must meet the demands of consumers; building high quality housing is the vital choice of the real estate enterprises.

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