

# Research on Product Decision of Real Estate Project Based on Big Data Analysis

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**Abstract:** The characteristics of product decision-making of real estate projects are determined by the particularity of real estate projects. Because the development and construction period of real estate projects is long, the investment is large, many parties participate, there are many risk factors in the development process, and after the development is completed, it is unrepeatable, and most of them aim at profit. Real estate regulation and control is a long-term work, and it is urgent to establish a set of operational analysis and decision support platform that runs through the whole chain of real estate and connects national and local levels, so as to realize real-time data aggregation, online calculation of indicators, rapid organization of content, rapid assembly of functions and flexible customization of services. In this paper, BD (Big Data) technology is used to collect real estate-related market data such as land, housing and finance, macro-statistical data such as population, society and economy, as well as real estate policy and public opinion information, to carry out system design and technology development, and to establish a real estate DSS(Decision Supporting System) based on BD. The system is helpful to carry out dynamic monitoring, analysis and evaluation of the real estate market, and effectively supports the product decision-making of real estate projects.

**Keywords:** Big Data, Product Decision, Real Estate Project.

## 1. Introduction

As an industrial sector that has great influence on the national economy and urban economic development, the real estate industry also faces many problems in its rapid development, which requires the relevant government departments to make scientific decisions and actively guide the development of the real estate market on the basis of correct prediction, so as to promote the healthy development of the real estate industry [1]. Real estate is a commodity formed by consuming land, a natural resource. First of all, it should provide social citizens with the most basic living security and realize "home ownership". Secondly, its economic attribute determines that real estate is a carrier to satisfy people's pursuit of high-grade life.

At present, the focus of real estate regulation and control work is to fully implement the main responsibility of the city government, implement the prudent management system of real estate finance, strengthen market monitoring, establish a monitoring index system for residential land market, and put forward new requirements for unswervingly implementing the long-term mechanism [2]. Real estate regulation and control is a long-term work, and it is urgent to establish a product decision support platform for real estate projects based on BD (Big Data) analysis, which runs through the whole real estate chain and connects the national and local levels, so as to realize real-time data aggregation, online index calculation, rapid content organization, rapid function assembly and flexible service customization.

## 2. Characteristics of Product Decision-making of Real Estate Projects Under BD

BD can discover the potential laws between data through data mining, intelligent analysis and other technical means, so as to make a scientific prediction of the development trend of future things, thus improving the operation efficiency of BD

application fields and obtaining greater economic and social benefits. Therefore, it can be concluded that the main function of BD application at present is decision-making [3-4]. How to use effective data analysis tools to dig out more valuable information hidden in data to assist management and decision-making.

The actual demand of large-scale massive data integration and deep-level analysis gave birth to data mining [5]. The storage and analysis requirements of massive and complex data, the development and application practice of database and data warehouse technology, machine learning and statistical analysis theory, and the common characteristics formed by the integration and development of various disciplines, data mining came into being.

The characteristics of product decision-making of real estate projects are determined by the particularity of real estate projects. Due to the long development and construction period of real estate projects, large investment, multi-party participation, many risk factors in the development process, non-replicability after development, and profit-making as the goal [6-7]. The characteristics of investment decision can be summarized as follows: the diversity of decision-making subjects, the complexity of decision-making data, the uniqueness of decision-making process and the materiality of decision-making results. Product decision-making of real estate projects under BD presents new features in decision-making subject, decision-making data, decision-making process and decision-making analysis (Figure 1).

It is necessary to pay more attention to user data in the decision-making process of real estate projects, so as to improve the efficiency of information feedback and the market recognition of users for development projects [8]. The popularity of BD thinking and the development of BD technology can effectively solve the dilemma of low user participation and insufficient utilization of user data in the product decision-making process of real estate projects, and directly create value through deep mining of user data. The massive and diverse characteristics of BD will become an

important source of product decision analysis of real estate projects after screening and cleaning.

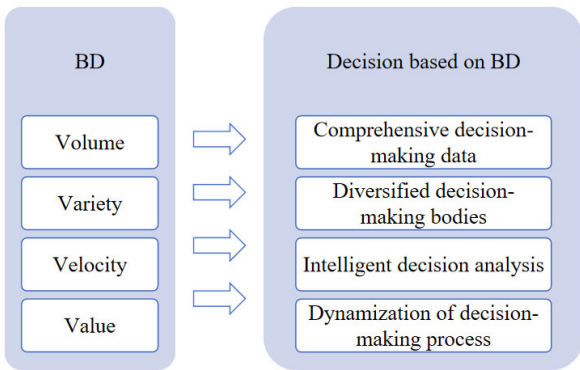


Figure 1. Characteristics of product decision-making of real estate projects under BD

### 3. Design of Real Estate DSS Based on BD

DSS(Decision Supporting System) is an intelligent man-machine system based on management science, operational research, cybernetics and behavioral science, with computer technology, simulation technology and information technology as means, aiming at semi-structured decision-making problems and supporting decision-making activities [9]. It provides an environment for decision makers to analyze problems, build models, simulate decision-making processes and schemes, and calls various information resources and analysis tools to help decision makers improve their decision-making level and quality. The purpose of DSS is to provide decision support for decision makers, and decision support is realized through the decision-making process, which is a process of asking questions, analyzing problems, solving problems and evaluating problems.

The way of thinking in BD era is characterized by full

sample, fault tolerance and correlation [10]. At the same time, the development of BD technology provides conditions for assisting scientific decision-making, which makes policy-making more objective and accurate. In this paper, BD technology is used to collect real estate-related market data such as land, housing and finance, macro-statistical data such as population, society and economy, and information such as real estate policy and public opinion. Facing key problems in the real estate field, BD fusion analysis method and model base are studied and established, and real estate analysis and DSS are developed. In order to realize the dynamic monitoring, analysis and evaluation of the real estate market through the application of the system, and form a series of analysis reports to effectively support the decision-making of real estate projects.

The real estate market is a multi-level and multi-structure complex system involving government policies, land transactions, housing projects, property rights transactions, development enterprises, financial institutions, brokerage institutions and buyers. The real estate market itself is affected by realistic factors, environmental factors, market factors and social factors, so the real estate market BD is a collection of physical data, peripheral market data, macro-policy data, participant behavior data and real estate-related economic, land, financial and demographic data. Use BD technology to collect information related to land use, real estate development and real estate transactions [11]. BD platform should at least support data collection, data exchange and sharing, metadata management, data service and other functions, and pay attention to the construction of thematic data and thematic data on the basis of data collection into the lake (data lake), so as to facilitate the classification and standardization of various data of real estate projects and support the upper application.

According to the demand of real estate DSS, the overall structure of real estate DSS consists of three levels: source data layer, data conversion layer and analysis and display layer. As shown in Figure 2:

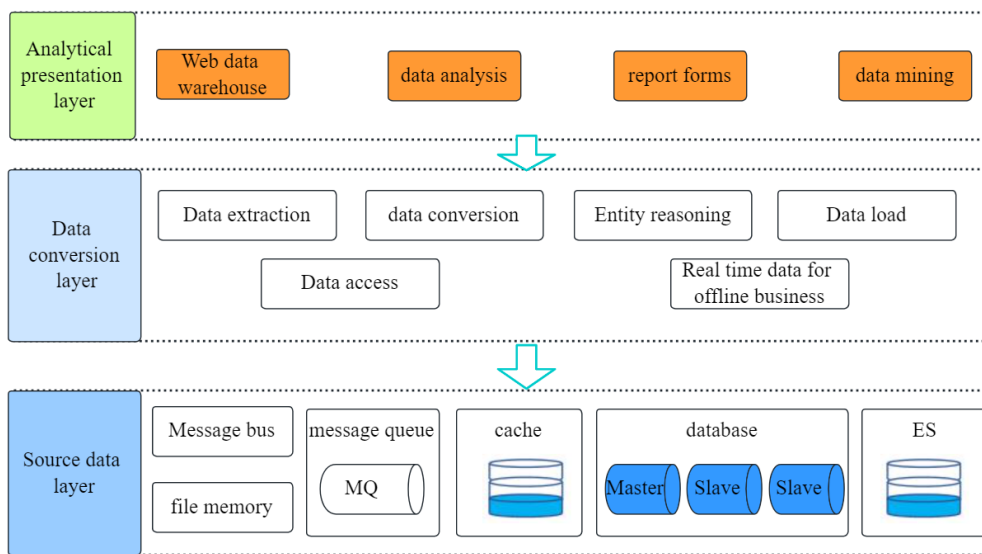


Figure 2. Overall structure of real estate DSS

The source data layer includes currently running applications, such as various transactional applications based on relational databases, office automation management

applications, etc., to realize daily business processing, and the data processed by these systems is the data source of the data

warehouse. The types of data sources include relational databases, office data, flat files, etc.

The data conversion layer realizes the process of data extraction, conversion and loading. The original log is cleaned and analyzed and converted into table data in the database, including the loading of online log and navigation path data table and the loading of entity dimension table. In this real estate DSS, data warehouse includes two topics, one is the click history generated by network users related to Web logs, and the other is the customer data based on brokers in business.

By running predefined stored procedures, the analysis and presentation layer integrates data that can provide decision support according to business requirements and loads them into the Web data warehouse, which stores all kinds of historical data related to decision-making to meet the decision-making needs at all levels. Using the data mining model, analysts use the data in the data warehouse for time series analysis, user behavior habit analysis, and predict sales performance according to historical records.

#### 4. Collaborative Analysis of Real Estate Development Decision and BD

The natural attribute of real estate determines that it must be attached to a specific spatial land resource in the city. The choice of housing by residents is the understanding and value balance of urban space by micro-social individuals. The price difference of houses in the same city, the same type and the same grade can be regarded as the cost of urban space; By collecting public opinion information in the real estate field from electronic newspapers, news websites and government websites, we can monitor the public opinion trends in the real estate field, extract news topics, opinions of expert institutions, main statistical indicators and other contents based on natural language processing technology, and establish a positive and negative sentiment analysis model of public opinion.

In the process of establishing the relationship between real estate projects, we should take real estate projects as the core and try to establish the relationship from the related data such as land, construction projects and houses. Establish the relationship between real estate projects and construction projects. Here, we can consider the corresponding correlation between the project information of residential construction and the information of building construction permits of residential construction, and establish the relationship between the two parties through the construction permit number. Finally, establish the relationship between real estate projects and housing projects. In order to provide basic support for the subsequent establishment of real estate project whole process integrated ledger and data application and decision support. At the same time, for those that cannot be automatically associated, we can consider adding the manual maintenance function module of real estate project association to realize the manual maintenance of real estate project association and ensure the correctness of the association between projects.

Obtaining BD related to product decision-making of real estate projects is a systematic work throughout the whole investment decision-making process and is the basis for the next decision-making data analysis. Project development BD

related to the decision-making process is divided into three categories: network data, facility data and local data (Figure 3).

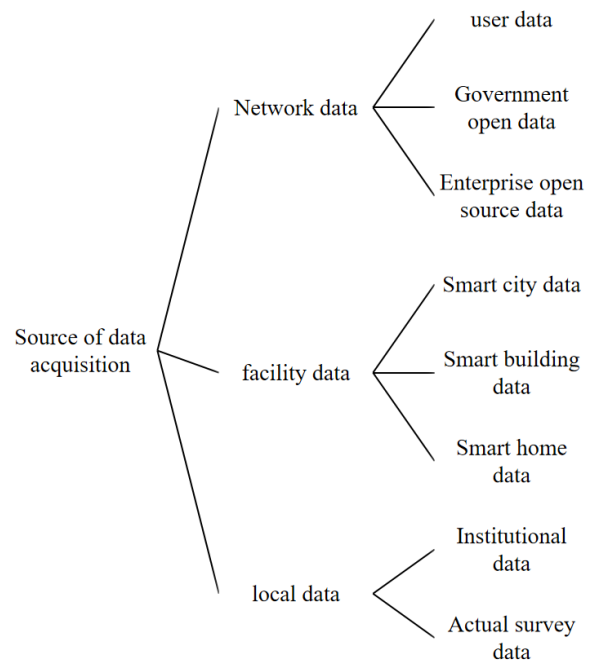


Figure 3. Source of data acquisition

Network data is typical semi-structured/unstructured data, which is generated from the Internet and users, enterprises and government departments connected with the Internet. The rapid development of smart city construction based on Internet of Things, cloud computing and other technologies can make facility data richer and facility types more diverse. In addition, with the further improvement of data storage technology, the availability and pertinence of facility data are gradually improved, which can provide objective and rich data types for comprehensive scientific decision-making of real estate development investment. Local data are mainly composed of institutional data, actual survey data and internal data of enterprises. This kind of data plays an important role in the decision-making process of traditional real estate projects.

Based on the theoretical framework of real estate regulation and control, the influencing factors of real estate market are deeply analyzed, and the monitoring and analysis index system of real estate market is constructed from the aspects of land, housing, population, housing enterprises, finance, policy and public opinion. Based on the planning conditions and surrounding facilities, the maturity evaluation model of stock land is established, and the evaluation and prediction model of housing ownership is established according to the data of housing registration, building census and housing pre-sale, so as to realize the temporal and spatial prediction of listed houses in the city. It is necessary to fully collect all kinds of micro-individual data from different income classes, different occupational structures and different backgrounds, and fully reflect the inclusiveness and sharing of urban real estate development.

Through workflow, the definition of planning and mechanism, the creation and reorganization of modules, the capture of demand reflection, the implementation of auxiliary decision-making and the analysis and evaluation of implementation results are realized. So as to match the supply

side of the real estate market with the consumption side of the demand side, and thus achieve the purpose of accurate and effective supply.

## 5. Conclusions

At present, the focus of real estate regulation and control work is to fully implement the main responsibility of the city government, implement the prudent management system of real estate finance, strengthen market monitoring, establish the monitoring index system of residential land market, and put forward new requirements for unswervingly implementing the long-term mechanism. BD can discover the potential laws between data through data mining, intelligent analysis and other technical means, so as to make a scientific prediction of the development trend of future things, thus improving the operation efficiency of BD application fields and obtaining greater economic and social benefits. Through BD customized development, development risks can be reduced and customer satisfaction can be improved. Therefore, we should strengthen the in-depth application of BD in all fields and links of real estate development, improve the efficiency and quality of decision-making, actively develop quality housing around the effective demand of society, promote the reform of real estate supply side, and solve the problem of imbalance between supply and demand structure of real estate in China.

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