Research on Construction of Intelligent Cost Database Sharing Platform Based on Multi-industry Perspective

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Abstract: With the rapid development of China's urbanization, the problems caused by the difficulty in obtaining cost information and low accuracy are becoming increasingly prominent. Therefore, it is very necessary to build a unified cost database in column setting standards for different industries. Based on the literature research on the use of cost data in multiple industries, the current situation of the use of existing engineering cost databases in China is analyzed. In view of the problems and deficiencies in the using process, a method for constructing and applying a smart cost database sharing platform from a multi-industry perspective is proposed. By verifying the feasibility of this idea, a reference for the establishment of future cost database is provided.

1. Introduction

With the global economic integration trend becoming more and more obvious, China's construction industry has also developed accordingly, and the number and scale of projects have been unprecedentedly expanded. Therefore, it is especially important to plan and control the cost of early-stage engineering projects. As an important method of project cost accounting, there are still problems such as difficulty in collecting cost data, poor data accuracy, and lagging control. Through the establishment of a professional completed project cost case management organization abroad, after collecting and sorting the cost cases, it has achieved significant results in measuring the construction costs of other projects [1]. If we learn from and appropriately transform and innovate, and establish a scientific and comprehensive cost database sharing platform for multiple industries with unified standards, the existing domestic cost data using problems will be greatly improved.

2. Application Status of Cost Database in Multiple Industries

2.1 Real Estate Industry

Zhang Tianbao [2] has proposed that the domestic real estate industry has developed extensively, but no relatively independent systematic accounting standards have been formulated for the real estate industry, which has caused relevant financial personnel to develop cost accounting work because there is no uniform standard and guidance. And in the difficult and embarrassing situation of accounting, finance and accounting personnel usually make detailed cost accounting adjustments based on their professional understanding and subjective tendencies, which are mixed with too much subjective factors and random space.

How to use the cost data in the real estate cost valuation method is even more divergent. Du Kui [3] and others pointed out that when using the cost method to calculate the building cost, on the one hand, the approximate budget can be based on the design drawings, and on the other hand, it can be based on similar projects. However, it is obvious that the accuracy of the latter is not as good as the former, and sometimes the latter will cause a large deviation. Su Leilei [4] believes that the unit comparison method is used to estimate the construction safety project cost, and the similar project is investigated to investigate the Adjusting the evaluation object will make it more reasonable.

According to the research results of the above scholars, it can be seen that many of the cost estimates for project construction in the real estate industry are determined by using experience and

speculation to determine cost data. There is no uniform standard for the data, and it is difficult to find the data. The disadvantages of the current cost database application in China.

2.2 Construction Engineering Cost Management

There are many completed projects in China, and the cost data of these projects have great reference significance for other projects, but there is currently no comprehensive information management platform to collect and sort these data, resulting in poor data circulation. Some companies even don't pay much attention to the collection of cost data at all, and rigidly adjust the cost methods of other companies, resulting in large deviations between their estimated results and actual results. Xiao Yan [5] pointed out that in the current cost of construction projects in China, the large difference between the estimates, budgets and final accounts is a common problem, and believes that efforts should be made to achieve systematization and standardization of project cost management.

Data collection is the root of the establishment of databases. At present, there are problems with the use of databases in China. In fact, there are problems with the collection of data. To build a complete and usable cost database, it is necessary to change the current situation in a one-stop manner and create scientific data.

2.3 Construction Cost Management

The successful implementation of construction engineering projects cannot be separated from the cost management of the entire link. Only when the cost is accurately estimated and set, can the project construction process be effectively avoided from deviating from the budget, causing unnecessary waste of materials and human resources. At present, many construction companies in China cannot ensure the scientificity and accuracy of cost information, and have not scientifically combed the entire process before starting the project. This leads to the disconnection of the project cost management in different links [6], and difficulties in cost control.

And foreign scholars are relatively mature in the cost database management of completed projects, and even set up a special agency to manage the project cost database, which shows that this method is feasible and can effectively solve the problems existing in the construction industry at this stage. The research scholars also agree with this idea and have carried out a lot of research, but because of the late start, the theory and practice have not been well integrated. The existing databases still have difficulties in data collection, incomplete content, and sharing. Issues such as non-university need to be further improved to make the industry's internal management clearer and cost estimates more accurate.

3. Countermeasures to Improve Cost Database

3.1 Unified Column Standards

There are many provinces and cities in China, including many construction units. The database columns in different regions are not uniform, the standards are different, the data is difficult to circulate, so it is not conducive to statistics of relevant national departments, and the reference value is small. Therefore, the relevant departments should coordinate the work after fully understanding the use of the cost database in each region, and issue a reasonable policy to regulate the construction of the database in order to meet national unified standards, thus promoting the improvement of the engineering cost database.

3.2 Standardizing the Collection of Data

(1) Guarantee the quality of the data. The main body of the database is the data, and the quality of the data reflects the quality of the database. Therefore, when collecting data, you should ensure that the data source is reliable, filter and remove data of little significance, and check it repeatedly during the entry process to avoid errors.

(2) Classify the data. The data collection should be convenient for later data processing and should be stored in different categories, such as according to housing, bridge, highway, hydraulic,

and power engineering, or classifying by different periods. After processing, it is also beneficial for data search in different industries and makes the database structure clearer.

(3) Update the data in a timely manner. The collection of data is not a one-time effort. Over time, the number of completed projects is increasing, and the cost quota has also changed. It is necessary to continuously repeat the data collection process. Updating the database in a timely manner will have no value. The data is cleared in time to ensure the vitality of the database.

3.3 Combining Internet Technology

With the development of science and technology, data management is no longer limited to paper books or single-entry entry. The Internet has become quite common in China. Data collection no longer needs to travel around, only need to upload via the Internet, use software operation technology, establish an intelligent cost data platform, classify and manage the collected data, and integrate similar engineering data as much as possible. Retrieval can meet the needs of engineering projects of different types and periods to solve the problem of low cost database penetration rate, thus achieving the real "intelligence" and "sharing".

3.4 Training Professionals

As mentioned above, no matter it is the management of the database or the collection of data, it is indispensable that professional talents are needed to complete the construction. Some foreign countries have established special institutions to manage the engineering cost database. This shows the importance of talents in the establishment of a cost data sharing platform.

Since the end of the 20th century, the number of college graduates in China has increased year by year. In 2001, the number of college graduates nationwide was 1.14 million and reached 7.65 million in 2016. In the past 15 years, the number of college graduates has increased by 6.7 times, with an average annual growth rate of 13.5%. With the rapid development of Chinese colleges, the number of college graduates is constantly increasing, and the employment pressure of college students is also increasing [7]. The establishment of an intelligent cost data sharing platform necessarily requires the establishment of a special institution for construction management, which happens to require these high-quality talents. While cultivating professional talents and assisting in the construction of a cost data platform, it also reduces the employment pressure of college students, which achieve many things at one stroke.

In general, engineering cost data is managed by talents who master in cost. However, if you want to realize the intelligence of the data platform, it is not enough to have expertise in cost. It also requires the introduction of talents in computer technology outside the field, attaching importance to the cultivation of talents in information technology management, combining the management of cost databases with the computer Internet, thereby improving the construction of cost data sharing platforms.

4. Application of Intelligent Cost Data Sharing Platform

4.1 Basic Applications

The intelligence of the cost data sharing platform is built on the basis of ensuring the basic functions. The platform still retains the functions of information release, case collection, and data query. On top of this, the data will be improved and verified to ensure the integrity and reliability of the data and make it more convenient and quicker.

4.2 Suitable for Multiple Industries

In the process of applying the construction cost data sharing platform, due to the diversity of projects, it is difficult to directly find the same cases as the projects being built. The data network is large and fragmented, so it takes time and effort to find one by one. Therefore, the sharing platform will process and classify the data, disassemble different parts of each case, store them in different databases, and reorganize according to the keywords found by users in use, so that you can meet the precise needs of data for different projects, such as investment estimates, preliminary design

Estimates, construction drawing budgets, etc., which can be completed quickly through advanced retrieval to ensure the timeliness and accuracy of construction costs.

4.3 Real-time Update

The traditional engineering cost database has the problems of low information accuracy and poor circulation. Because different construction materials are used in an engineering project, and the price of materials will change with the market, this will directly affect the construction cost. Therefore, the data sharing platform also makes improvements to strengthen the data circulation, update the cost data and data records of completed cases in real time, and keep the data sharing platform alive, which will not cause large deviations in project costs due to stale data

5. Feasibility Analysis

With the development of science and technology, the application of the Internet and information technology is becoming more and more widespread. It is not impossible to combine the construction of cost databases with the Internet as a way to achieve intelligence. At present, there are many similar platforms, such as CNKI (China National Knowledge Infrastructure), which contains a large and comprehensive professional literature that we can retrieve the information we want by searching for keywords, which also verifies the feasibility of establishing a smart cost database sharing platform.

In addition, some countries have achieved the establishment of a comprehensive cost database, and established special institutions to manage it. Scholars in related areas in China also agree with this view, so cost data sharing and intelligence are just around the corner.

6. Conclusion

Based on the analysis of the existing problems in the use of the cost database in domestic multi-industries, the general design of setting up an intelligent cost data sharing platform are proposed, and its feasibility is analyzed in order to provide a reference for the improvement of current cost database. If the intelligent cost data sharing platform can be realized, it can effectively solve the difficulty in case collection, poor data circulation, and low information accuracy in China.

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