Research on Application of Computer Aided Mapping in Real Estate Surveying and Mapping

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Abstract—This article analyzes and studies the application advantages of computer-aided drawing. The research content of this paper includes improving the efficiency of drawing, optimizing manual drawing, more perfect graphical output, more convenient storage and management. The author studied the basic data collection, clarifying the principle of layering of drawing elements, determining the form of drawing, editing and processing of collected data, checking of output shape data, graphic plate making and printing and other technical application points. This paper studies the optimization of database content, the improvement of network information sharing, and the optimization of operating systems. The purpose of this article is to optimize the results of real estate surveying and mapping and improve the effect of computer-aided mapping.

1.INTRODUCTION
In the development of the real estate industry, in order to provide users with a richer application experience and speed up the efficiency of drawing during work, companies will use computer drawing software to assist in the surveying and mapping work. This is also an important application trend in the development of computer-aided mapping in real estate surveying and mapping in the future. The application of carding technology in real estate surveying and mapping plays a positive role in enhancing the application value of computer graphics technology.

2.APPLICATION ADVANTAGES OF COMPUTER-AIDED DRAWING

2.1. Improve Drawing Efficiency
In the past, real estate surveying and mapping used manual methods to draw structural sketches when collating real estate surveying and mapping data, and the overall mapping efficiency in the overall application process was relatively low. Otherwise, the error tolerance rate of the collation results is high, and the relevant staff need to repair it many times, which increases the time cost of this process. Relying on computer-aided drawing technology to summarize and organize the collected data, CDA software can be used to complete the construction of the graphic database. In the follow-up operation, we can deal with the details in the existing graphics, thereby reducing the time cost of the drawing process. Moreover, in practical applications, we can also use software to complete the summary and sorting of the corresponding data. We can rotate and edit graphics based on actual needs, which can improve the reliability of data processing results.

2.2. Optimize Manual Drawing
When organizing surveying and mapping data, the first task is to make manual mapping. In the specific
drawing process, the relevant staff not only need to prepare some basic drawing tools, but also need to perform basic analysis on the basic data. The complexity of the pre-organization work is relatively high, and the relevant staff need to complete the corresponding preparation work before they can carry out the subsequent application management work. Relying on computer-aided drawing technology to summarize and organize collected data, CDA software can be used to complete the drawing work. At the same time, many options and colors are included in the software, which also greatly improves the orderliness of the drawing process. Moreover, this can also control the accuracy of the drawing data, thereby improving the reliability of the analysis results.

2.3. Graphic Output is More Perfect
When performing computer drawing and sorting, real estate companies can use the grasping point mode provided in the CAD mode to complete the graphics accuracy processing. In this process, real estate companies can use this application mode to complete the optimization processing of corresponding data information, and sort out the graphic deviation values during the drawing period. In this process, real estate companies can also take into account their beautiful appearance, and optimize and improve the aesthetics of manual drawing. This can be used to improve the aesthetics of the output results and ensure the convenience of the data information itself.

2.4. More Convenient to Save and Manage
After the manual mapping work is completed, there are greater difficulties in the preservation and management of the soil content. Moreover, its practical application effect in the whole process is low, which is not conducive to the subsequent retrieval of data information. In the process of CAD software application, real estate companies can use digital data to store information, and the storage process has strong functional boundaries. Real estate companies are also more convenient in the management process, which can also greatly reduce personnel and material costs. But it should be noted that the picture information used in the actual application process also needs to be backed up again. This can reduce file damage or accidental deletion and improve the integrity of the collected data itself.

3. Specific Application Points of Computer Aided Drawing

3.1. Basic Data Collection

3.1.1. Base Map Information Collection
The basic base map data uses 1:10000 digital map data, and extracts relevant elements as needed for editing as the base work base map, which reduces the map digitization work and greatly improves work efficiency. 1:10000 digital topographic map mainly realizes information input, storage, query, retrieval and statistics based on spatial information. The 1:10000 topographic map can be divided into ten major information categories according to the requirements of the diagram. In order to generate social and economic benefits as soon as possible, the 1:10000 digital topographic map uses hierarchical digitization to assign attribute codes to different elements. The data stratification is shown in Table 1.

| Serial Number Layer | Heading                                         | Code |
|---------------------|-------------------------------------------------|------|
| 1                   | Measurement Control Point                       | A    |
| 2                   | Residential Area to Scale                      | B    |
| 3                   | Residential Areas and Yuanzha Not to Scale     | C    |
| 4                   | Industrial and Mining Construction (Structure)  | D    |
| 5                   | and other Facilities (Line, Surface)           |      |
| 6                   | Industrial and Mining Construction (Construction) | E    |
| 7                   | and other Facilities (Points)                  |      |
| 8                   | Transportation and Ancillary Facilities        | F    |
| 9                   | Pipelines and Ancillary Facilities             | G    |
| 10                  | Water System and its Auxiliary Facilities      | H    |
| 11                  | (Surface, Line)                                |      |
| 12                  | Water System and its Auxiliary Facilities      | H1   |
| 13                  | (oints)                                        |      |
| 14                  | Water System and its Auxiliary Facilities      | H2   |
| 15                  | (Yantian and Taitian Internal Lines)           |      |
| 16                  | Landform and Soil Quality (Surface, Line)      | J    |
| 17                  | Landform and Soil Quality (Point)              | J1   |
| 18                  | Contour Lines and Elevation Points             | L    |
For some GIS data that cannot be used, scanning vectorization must be performed. We can scan the paper base map first, and then form a raster graphic file in TIF format on the computer. Finally, we can use the vectorization function in MapGIS for vectorization. Vector data is easy to modify, edit and scale at any scale, and it will not cause problems such as deformation and distortion. This also facilitates the quick sorting of subsequent data.

3.1.2. Traffic Line Mapping
In the process of real estate surveying and mapping, we also need to take into account the traffic line surveying and mapping work, which includes road monitoring in the community and monitoring of surrounding buildings. In the specific surveying and mapping work, we need to count the following aspects. Firstly, all the number of buses, trams, and special-line transportation vehicles passing in the area. This is also an advantage item during the later sales period. Secondly, determine the specific location of the bus stop passing by. In the actual application process, we need to sort out and analyze the running lines. Otherwise, we need to understand the operating conditions of the traffic lines to ensure the reliability of the line mapping results.

3.1.3. Text Data Collection
In the application of computer graphics technology, we also need to pay attention to the collection of textual data. Judging from the actual application, its content includes the following points. Firstly, computer graphics technology can record the geographic location of the real estate. Usually, the system will be set by means of Chinese and English labels, such as building number, unit, kindergarten, etc. Secondly, computer graphics technology not only needs to sort out the road distribution information in the community, but also need to collect traffic data around the property, and mark the specific geographic location and Chinese and English labels. This can meet the application requirements of text data collection.

3.1.4. Picture Data Collection
Except to the basic information mentioned above, in the application of computer graphics technology, we also need to pay attention to the collection of image data. Judging from the actual application, its content includes the following points. (1) Use surveying and mapping technology to take a picture of the real estate area, and mark some important areas such as small parks and leisure facilities in the area. This can improve the reliability of the analysis results. (2) When analyzing and processing the collected images, we need to sort out the content of some pictograms with the help of digital photography and scanning. Simultaneously, we can also perform comprehensive processing on the signal, which can improve the reliability of the data processing results.

3.2. Clarify the Layering Principle of Drawing Elements
Layer provides layered graphics editing function, which divides geographical elements with the same attributes into one layer. The layering function of MapGIS brings great convenience to the editing of the map, which is helpful for the editing, modification, and retrieval of graphic data. In the process of drawing element processing, the system is mainly stratified according to different elements. Each element has its own parameters. Line elements have line type, color, line width, etc., point elements (symbols and notes) have parameters such as height, width, color, and font, and each color in surface elements has a corresponding color number. The layering of the same type of elements makes each layer independent and related to each other, and we can use layers for flexible combination and editing. Through the switch of the layer and the transformation of the current layer, you can directly view, call and extract the content on the layer related to the theme. This process is quite intuitive and easy to operate, which also achieves the purpose of one picture with multiple uses. Proper use of layers can not only avoid duplication of labor and save workload, but also ensure the coordination and unity of the content on each map.
3.3. Determine the Form of Drawing

As shown in Figure 1, when sorting out real estate surveying and mapping data, we can process it by determining how to determine the form of the drawing. We can adjust the line width and spacing to ensure the rationality of the data application process. In the specific finishing process, we also need to pay attention to the following points. (1) We need to sort out the data and information around the real estate. This kind of data information needs to use Chinese and English signs so that it can serve as a basic requirement for prompting regional users. Moreover, the construction of grid lines in the drawn map is also conducive to the smooth search of each unit house, thereby improving the reliability of the road query results. (2) We need to separately express the buildings in the community. For example, we can use some image-like symbols on the outer layer of the building to identify the specific location of the building, so that users can find it easily after moving in, and provide users with more convenient conditions.

3.4. Collection Data Editing and Processing

3.4.1. Line Edit

After the surveying and mapping data is acquired by the surveying and mapping technology, it enters the stage of data information collation. In this process, the first task is to edit the collected data online, and use Map GIS software to complete this link. In specific applications, we can follow the procedure below. Firstly, after entering the Map GIS software, select the attribute item of road width in the gallery content displayed by ARC/INFO to fill in the design width of the community, that is, define the DIA road width. Moreover, we can use the buffer function in ARC/INFO to get the edge data. Secondly, we can use the conversion data interface established between ARC/INFO and Map GIS software to convert data information, which is beneficial to form a MAPGIS line file that is easy to edit and process. Thirdly, we need to import the file into the Map GIS software. We can edit it according to specific functional requirements. Considering the large number of information points for data vectorization, we also need to use software to clean up intermediate nodes. This is conducive to the smooth progress of subsequent editing work [1].

3.4.2. Click to Edit

When using computer graphics technology to process data, it also involves point editing. The content of the so-called point element includes spatial application data and real estate parameter data. When we process spatial data, the main content is to increase or decrease control point data to improve the convenience of subsequent data processing. The processing of real estate parameter data will adjust the color, angle, size and other parameters of the iodine element to ensure the reliability of the processing results. In the specific editing process, we need to do a good job in symbol editing. Its content includes pictograms and schematic symbols, which will increase the richness of the content of the real estate,
and use text descriptions to remind its guiding value. The work of text editing is to edit some special content. This can ensure the reliability of the results of information combing and enhance the use value of the edited content [2].

3.4.3. Face Edit
In addition to the first two editing methods, when processing data information, we also need to pay attention to the advancement of the editing work. This process will also be processed with the help of Map GIS to form a relatively stable application area. In the specific processing of data, we need to complete the preprocessing of data information first. In this way, the previous line data can be converted into arcs, and the data can be checked interactively. Meanwhile, we should also do a good job in topological troubleshooting, which will also facilitate the smooth progress of activities such as correcting errors. Besides, we also need to establish corresponding processing graphics such as fill patterns, and do a good job of color processing, so as to improve the solution effect of complex graphics and ensure the final processing effect [3]. For example, the filling color of the completed construction area is C=5, M=16, Y=19, the filling color of the green land in the community is C=34, Y=32, and the filling color of the leisure activity area is C=37, Y=40. This can improve the intuitiveness of making graphics.

3.5. Output Shape Data Check
After processing the real estate surveying and mapping data using computer graphics software, it enters the link of output shape data verification. The main content is to correct the wrong parameters to ensure the reliability of the processing results. In the actual check, first, we need to check the basic parameters of the real estate. The inspection content includes shape, area, side length, height, floor, name, etc. If there is wrong data, we also need to process it in time to improve the reliability of the data processing results. Second, we should correct the color content. Color has a strong ability to express shapes. How to use color reasonably can directly enhance the final application effect of surveying graphics. In the actual application process, we can compare the corresponding construction plans and set up reliable analysis results according to the relevant content marked in the plan. This can meet the application requirements of the actual processing process [4].

3.6. Graphic Plate Making and Printing
After the above content is completed, the system enters the final application link, that is, graphic plate making and printing. Printing the paper version not only facilitates the user's intuitive understanding of parameters, but also facilitates sales and related work. In the process of graphic plate making, we need to analyze its proportions to obtain reliable application data. Moreover, during the process, we also need to do a good job in the selection of printing equipment, and choose digital color printers for processing. This can improve the degree of refinement of the printing results and enhance the application value of data information.

4. Analysis on the Development Trend of Computer Aided Drawing Technology

4.1. Optimization of Database Content
Judging from the current development situation, the database content will also be continuously optimized in the application and development of computer-aided drawing technology. At this stage, the richness of surveying and mapping technology is constantly improving. This also improves the richness of collected data. In the subsequent development process, the types of data include images, data packets, and digital information in addition to text and pictures. The enrichment of database content not only improves the application value of the information content itself, but also puts forward new application requirements for the compatibility of computer-aided graphics technology [5].
4.2. Improved Network Information Sharing

At this stage, the development speed of Internet technology is also increasing. In the subsequent development process, the sharing of network information will also be continuously improved. For example, in the context of big data technology application, real estate companies can establish corresponding data sharing platforms. Real estate companies can upload corresponding real estate information on the platform to broaden the spread of real estate information. The application also has cross-regional information exchange, which can provide corresponding convenience for subsequent sales management. What's more, this also brings better application effects to the optimization of network information sharing [6].

4.3. Operating System Optimization

At present, computer functionality is developing in a diversified direction, which has also led to the continuous improvement of computer performance optimization. Moreover, the richness of the content of the window operating system is constantly optimized. In this way, the performance of computer processing software will be optimized to a greater degree. Simultaneously, with the help of interface connection, the operation activities can be completed smoothly, thereby improving the practicality of the system application results [7].

5. Conclusion

In summary, how to improve the accuracy of real estate surveying and mapping has become a key concern of enterprises in the context of the accelerating economic development of the real estate industry. Comprehensive processing of the obtained surveying and mapping data based on the application advantages of computer-aided software can not only improve the reliability of data processing results, but also play a positive role in enhancing the application value of data information.

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