

Research on Land Renovation Planning Strategy based on Digital Surveying and Mapping Technology

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Abstract

With the rapid growth of new surveying and mapping technology and surveying and mapping instruments, engineering surveying has also been developed rapidly. Land survey is a foundation for the country to effectively manage and plan land. When land is used, relevant information can be found in the database established in previous land surveys, so its accurate measurement method is particularly important. On the one hand, there are more and more land surveying work, and the surveying and mapping data of land surveying units are more accurate. On the other hand, with the increasing difficulty of land surveying, surveying units have put forward higher requirements for surveying and mapping technology. Under the background of the continuous growth of China's economy and society, the level of network information technology has improved rapidly, and digital information technology is widely used in land survey, which can improve the efficiency of land survey. This paper analyzes the application of digital mapping technology in land consolidation planning, hoping to provide some reference and suggestions for the smooth growth of land consolidation planning and the improvement of the accuracy of survey results.

Keywords

Digital Mapping; Land Remediation Planning; Land Survey.

1. Introduction

With the continuous growth of scie & tech, land surveying and mapping technology is also constantly improving. The application of digital mapping technology in land surveying and mapping technology not only saves the workload of land surveying and mapping process, but also makes land surveying and mapping technology more intelligent and improves the accuracy of land surveying and mapping technology effectively [1]. Because land survey mainly measures the land area, boundary and type, it has higher requirements for the accuracy of the measurement results [2]. In order to meet the requirements of land survey, it is particularly important to apply digital mapping technology, such as computer and satellite positioning. In the traditional land survey, many surveying and mapping links and jobs need to be carried out manually, which is greatly influenced by human factors, and the accuracy is very limited, and the workload is huge, which brings huge burden to the staff [3]. Traditional land surveying technology mainly uses remote sensing technology and surveying technology to map and survey land, but with the continuous growth of society, people's requirements for surveying technology and accuracy of land surveying are becoming higher and higher [4].

Digital surveying and mapping technology effectively overcomes the shortcomings of traditional surveying and mapping, promotes the progress of intelligent surveying and mapping, contributes to the improvement of land surveying accuracy and quality, and is of great help to the optimal utilization of land resources [5]. Digital surveying and mapping technology has the advantages of high surveying accuracy, high automation level, more information and

convenient storage. Therefore, it has been widely used in land surveying. After the application of this technology, the land surveying is simpler and the surveying accuracy is obviously improved [6]. On the one hand, there are more and more land surveying work, and the surveying and mapping data of land surveying units are more accurate. On the other hand, with the increasing difficulty of land surveying, surveying units have put forward higher requirements for surveying and mapping technology. Digital surveying and mapping technology can realize the enlargement of surveying units, save costs and effectively improve the accuracy of surveying and mapping data, so it is imperative to apply it in land surveying and mapping [7]. This paper analyzes the application of digital mapping technology in land consolidation planning, hoping to provide some reference and suggestions for the smooth growth of land consolidation planning and the improvement of the accuracy of survey results.

2. Overview of Digital Mapping Technology

2.1. Connotation of Digital Mapping Technology

Digital surveying and mapping technology is a measurement technology based on information technology, which requires the application of various modern measurement equipment, such as satellite positioning system, global positioning system and so on. Digital surveying and mapping technology can collect geological data information, convert these data information into digital form, summarize the digital information, and draw corresponding diagrams. Digital surveying and mapping is an electronic drawing method that uses modern measuring instruments to collect geological features and transform them into digital information in the form of coordinates, and then uses a computer to process the map through professional software [8]. Digital surveying and mapping technology is the representative of modern technology, inheriting the advantages of information technology, such as high calculation accuracy and fast information conversion speed. With the continuous development and change of the times, manual surveying and mapping has lagged behind the trend of the times. Digital surveying and mapping technology can make up for the deficiency of manual surveying and mapping and highlight the practical value of modern technology. Figure 1 shows a digital mapping drone.



Figure 1. Digital mapping drone

Digital surveying and mapping is based on computer technology, satellite positioning technology and other high-tech. The efficient, fast and accurate measurement results are more in line with today's information age. It has changed the traditional pattern of drawing on white paper in the past, and has the advantages of accurate measurement accuracy and shorter

measurement time. In this process, the main method used is the digitizer method, that is, the digitizer is used to collect the information data on the current map, while the aerial survey method mainly uses aerial survey and related remote sensing means to collect the information data of topographic points. The geodetic instrument method mainly collects the corresponding data in the field through theodolite, total station, dynamic gps and other related instruments.

2.2. Main Contents of Digital Mapping Technology

Digital mapping technology can draw digital maps in a short time. China has a vast territory, with different geological and geomorphological conditions in different areas, and complicated geological conditions in some areas, so it is difficult to draw digital maps. Therefore, the map drawn by traditional digital methods can't be used as the main data. The effectiveness of traditional digital mapping technology is relatively low, and it can't supplement the data of the drawn map, nor can it mark the coordinates of various places, and optimize and adjust the key coordinates. When the digital map of a certain area is needed, if the digital map of a certain area can't be drawn due to insufficient survey funds or time, this method can quickly solve this kind of problem [9]. Digitizing the existing map means processing the map with computer and its software, scanner, digitizer and plotter, etc., and quickly obtaining a digitized map within the specified time. When the map scale is very large, and it is necessary to map from a higher perspective, aerial surveying and mapping method is generally used. When applying this method, technicians need to photograph the ground in the air, obtain the geological and geomorphological information of the ground, and convert this information into digital form to build a basic model.

When scanning, it will inevitably be affected by some errors, and the result of its drawing is mainly to digitize the original image, which leads to its lack of timeliness. Therefore, this method can only be used for emergency needs, not as data preservation, but it can also be used to supplement and update the digital map obtained through further measurement according to the actual situation, and to accurately adjust the coordinates of some specific things. After modeling, technicians need to use modern technology software to draw maps and regularly supplement and update the map data. Aerial photography has the characteristics of accuracy, and the image data obtained by aerial photography can be directly converted into digital form. Digital technology can also highlight the applicability of surveying and mapping results. The surveying and mapping results obtained by traditional surveying and mapping work in the world in a certain way are not widely applicable. After the implementation of digital mapping technology, technicians only need to adjust the key data according to the key points of land surveying and mapping.

3. Application of Digital Mapping Technology in Land Renovation Planning

3.1. Application Advantage

Digital surveying and mapping technology can ensure the accuracy of surveying and mapping results. Digital surveying and mapping technology has the characteristics of information technology, and can automatically map the map by applying the computing function of computer. Digital surveying and mapping technology can ensure the accuracy of surveying and mapping structure in surveying and mapping work. This mapping technology has the characteristics of information technology, and it can automatically map the map with the help of computer's calculation function. The digital map marks the local geological and geomorphological features, which is convenient for technicians to update data and replace information. Because the digital map is more intuitive, non-technical people can also read the contents of the map. Digital mapping technology can improve the efficiency of land mapping.

The geology and geomorphology of the application site can be marked by digital map, which is convenient for technicians to update data and replace information. In addition, digital maps have the advantage of visualization, and even non-professionals can read the map contents.

The emphasis of traditional land surveying and mapping work is different, and the measured results are also quite different. The surveying and mapping results obtained by a certain measurement method are not suitable for all occasions, and technicians must constantly carry out surveying and mapping work to obtain diversified surveying and mapping results. After the application of digital mapping technology, technicians do not need to repeat surveying and mapping, but only need to adjust the key data according to the focus of land surveying and mapping. Nowadays, with the continuous growth of modern technology, the computer software has increased, and has been continuously upgraded under the impetus of technology. The upgraded software has made a greater contribution to digital mapping technology, which can greatly improve the quality and speed of surveying and mapping. Digital surveying and mapping technology can simulate the implementation scheme. In the process of applying digital mapping technology, it is necessary to take digital map as the foundation, process digital map under the action of various softwares, and get simulation results.

3.2. Application Practice

For a long time, the collection of surveying and mapping data is one of the core components of land surveying, which can have a decisive impact on the quality and effect of land surveying, and it is also closely related to the accuracy of land surveying. When collecting data, using digital mapping technology to carry out related work can further improve the efficiency of land survey to some extent. When measuring mining points, it is necessary to determine the location coordinates to form a closed measuring unit. After measuring the boundary point, other topographic points should be measured to improve the measurement accuracy of boundary point and topographic point. After doing a good job of data processing in the industry, a large part of the map drawing has already been done. The rest of the work only needs to print the original digital map, compare it with the actual situation in an all-round way, and make effective connection after filling some blank positions. Figure 2 shows the interface of digital map generation.



Figure 2. Digital map generation interface

Modern land surveying units are facing increasing competition pressure. If they want to maintain a favorable position in the market competition, they must give full play to the effectiveness of modern surveying technology. Digital surveying and mapping technology accelerates the speed of data processing, reduces the difficulty of data processing, and promotes the growth of modern land surveying units to a great extent. As the support of digital mapping technology, information technology is conducive to the formation of basic database, the storage of massive data and the establishment of database. The staff can collect the information and input it into the computer, and save it in a unified format. The format of the acquired information is different according to different acquisition devices. Data acquisition, data analysis and data processing are the key points of digital mapping technology. After completing the data processing steps, the digital map has been preliminarily completed. At this time, by comparing the digital map with the real objects, we can find that some exterior entities are missing from the digital map.

4. Conclusion

With the progress of scie & tech, digital mapping technology has developed rapidly and is widely used in various fields, and the application of digital mapping technology in land survey brings new development opportunities for land survey engineering. Under the background of the new era, how to strengthen the application of digital mapping technology in land surveying and create a more sound and effective land resource information center can make surveying and mapping products more diverse, and make surveying and mapping results more accurate, and reduce the construction cost. In order to digitize geographic information and establish related information database, it is necessary to use digital mapping technology to process geological topography in a modern, intelligent and scientific way. In order to improve the accuracy of land surveying and promote the growth of land surveying and mapping units, we must give full play to the advantages of digital mapping technology and make up for the shortcomings of traditional surveying and mapping methods. The application of digital mapping technology can not only help the country to know more about the land use situation in China, but also store the land survey information in a digital way and form a database, which greatly facilitates the subsequent retrieval and application of relevant personnel.

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