# Application of Digital Surveying and Mapping Technology in Territorial Surveying

Yiying Tan
Guigang City Gangbei Real Estate Service Station Guigang Guangxi 537100

**Abstract:**

*Driven by science and technology, surveying and mapping technology has been widely used in many fields of society, and the successful application in territorial surveying can achieve good measurement results. Various types of digital surveying and mapping technology need to be analyzed in detail to improve the skills of professional surveyors, so that the accuracy of measurement and the utilization of land resources can be improved to the greatest extent. In the process of applying digital surveying and mapping technology, it is necessary to strictly control each measurement link and step according to the actual situation, ensure that the surveying and mapping quality meets the specified standards, and improve the overall level of the surveying and mapping industry.*

**Keywords:**

*Territorial survey; Digitization; Surveying and Mapping Technique*

## I. Overview of digital testing technology

### 1. Digital technology of original map

The digital technology of original map has obvious advantages. In the drawing of large scale map, the use of vectorized scanning tools and hand-held tracking can perfectly overcome the phenomenon of large scale map input difficulty in traditional engineering survey. In the processing of original map information, the use of digital technology can not only significantly improve the input efficiency and accuracy, but also convenient, greatly reducing the burden of surveying and mapping personnel.

### 2. Digital mapping technology

Digital mapping technology can effectively improve the efficiency of surveying and mapping work by adopting the operation mode of integration of internal and external industries. In engineering surveying, the accuracy of mapping work has a great impact on the quality of mapping. The difficulty of surveying and mapping work is also different with different scales. The larger the scale of engineering drawings drawn, the more difficult the surveying and mapping work is, and the higher the requirements for surveying and mapping accuracy are. The application of digital mapping technology can play an important role in the mapping of large scale engineering drawings. It can not only greatly improve the quality of mapping, but also simplify the operation process, thus improving the efficiency of mapping work. At the same time, the application of digital mapping technology also helps to store the measured data information, reducing the investment of human resources.

## II. Analysis of the importance of digital surveying and mapping technology

### 1. The surveying and mapping process has been automated and intelligent

The digital surveying and mapping mode is mainly to use the new surveying and mapping technology to collect and enter the data of the land situation, and the surveying and mapping data are automatically processed and drawn by computer processing methods, and the whole surveying and mapping process has realized automatic and intelligent operation, and there is almost no need for manual operation to intervene, and the computer will automatically modify and process the geographic information data of the mobile phone intelligently, reduce the error of the mapping data, and can automatically generate data surveying and mapping indicators as needed. The application of digital measurement technology greatly reduces the operational difficulty of surveying and mapping work, and reduces the work intensity of surveying and mapping personnel.

### 2. Improve the accuracy of surveying and mapping information and reduce surveying and mapping errors

The biggest advantage of digital mapping technology is that it can control the mapping error to an extremely small range. In the past, the surveying and mapping method required a large number of manual operations to be completed, so there was often a large discrepancy between the surveying and mapping results and the actual situation due to the influence of the technical level of manual measurement, drawing habits or experience, and the performance would produce great errors in the drawing drawings. The application of digital surveying and mapping technology has fundamentally changed this situation, because the whole process of surveying and mapping is operated intelligently by digital technology, making the surveying and mapping information more objective and accurate.At the same time, digital surveying and mapping has realized multi-directional three-dimensional data scanning to prevent data omission.

### 3. The operation and use of surveying and mapping information are more convenient

The traditional surveying and mapping method is not conducive to the storage of data, and it is also inconvenient to retrieve and store the surveying and mapping information in the process of transmission and use. This problem is solved by the use of digital mapping technology, which allows maps and information to be scaled in different sizes as needed and to achieve angle conversions. The storage of surveying and mapping information is also completely saved by the internal system of the computer, which greatly saves the storage space. In the process of information operation, multiple data information windows can be opened at the same time in the same window, and the synchronous processing of multi-level information can be realized. At the same time, the transmission and sharing of information is also more convenient, which is convenient for data users to use.

## III. Application of digital surveying and mapping technology in land surveying

### 1. Application of 3S technology in land surveying

RTK positioning technology mainly uses carrier phase dynamic time difference for surveying and mapping, and the application effect is very ideal, and it has broad development prospects. RTK positioning technology can accurately locate the project and realize the function of online data transmission, which can not only effectively shorten the surveying and mapping time, but also improve the quality of the surveying and mapping project. Through the integration and optimization of various positioning technologies, RTK automatic positioning technology can be realized, which greatly reduces the error caused by manual surveying and mapping, and can effectively promote the accuracy of surveying and mapping operations. Inner page scanning technology is the use of digital scanning technology means to integrate the key information and data in the foundation and topographic drawings of the entire project into the computer system, and use professional technical software to dynamically analyze the data to ensure the quality of real estate information data collation. The use of digital scanning technology can be used to show the specific items in the drawings, such as urban planning, street layout, design routes, etc., so the inner page scanning technology can analyze the project changes to ensure the professional performance of digital mapping technology.

### 2. Application of geographic information system in territorial survey

In general, digital photogrammetry and remote control technology is mainly applied in aerospace, through extremely high resolution and spectral equipment for mapping work, but in the process of using digital photogrammetry and remote control technology must be manually controlled, according to different topics to make different real estate pictures. Through remote control, dynamic supervision can be carried out for the engineering project area, so digital photogrammetry and remote control technology are usually applied for the change of land resources. With the rapid development of modern science and technology, the application effect of informatization and data in all walks of life is very obvious. Through the use of GPS positioning technology, the construction situation of coal exploration projects can be monitored in real time and various accurate data can be obtained in time. Through the scientific database, we can make overall planning for the key information obtained by GPS positioning technology, and strengthen the quality control and schedule management of coal mine exploration and construction projects. Because the current system standards of China's construction industry are relatively backward, the relevant departments must improve the laws and regulations in a timely manner, so that the laws and regulations can carry out the necessary guidance for engineering surveying and mapping, clear the responsibilities of the government, and strengthen the implementation of the responsibility system. In the process of digital surveying and mapping technology, it should be unified

to formulate engineering surveying and mapping standards, mainly to formulate coordinate systems based on the actual situation of engineering projects, improve surveying and mapping work information, and promote the continuous improvement of surveying and mapping work. In the process of information analysis of real estate data in surveying and mapping areas, it is necessary to ensure the accuracy and reliability of various data, and it is necessary to fully demonstrate whether "quasi-land and resources management" can be used, and comprehensively consider the data obtained from land and resources management.

### 3. Application of global positioning system in land survey

At present, the efficiency of digital surveying and mapping technology in our country is relatively low, because the application effect of key technologies is not ideal. In order to effectively promote the efficiency of surveying and mapping work, relevant departments must strengthen the capital investment in digital surveying and mapping technology and strengthen the construction of surveying and mapping professional teams. Through training or education, surveying and mapping personnel are encouraged to actively master various advanced technologies, adapt to the development of The Times, and avoid being eliminated by the times. The application of high-tech knowledge can make the entire engineering surveying and mapping more efficient. For example, dynamic monitoring of real estate areas can be carried out through global positioning system, geographic information system, remote sensing technology, etc., and various data information can be integrated and stored in a timely manner to provide accurate reference for subsequent surveying and mapping by staff.

First of all, the existing data must be directly applied. Secondly, the data collection information should be maintained according to the actual characteristics of the data, and the validity of the data format should be paid attention to to ensure the accuracy and comprehensive content of the data and information. In the process of database processing, it is necessary to strengthen the level of data editing and sorting, and finally form a perfect real estate management system according to the statistics of data information content. In order to ensure the reasonable application of surveying and mapping technology in coal mine exploration, first of all, coal mine exploration personnel must make full use of GPS technology, establish position measurement and control network, and help exploration personnel realize rapid and accurate regional positioning through satellite positioning function. Through the establishment of control network, staff can carry out reasonable monitoring of coal mine area within a certain range. It can also avoid loopholes. In addition, in the process of the application of surveying and mapping engineering projects in our country, we must actively strengthen the cultivation of surveying and mapping talents, and only by strengthening the construction of talents can we ensure the continuous improvement of the quality and level of surveying and mapping technology application. If the surveying and mapping technology is not properly mastered, it is easy to cause errors in surveying and mapping exploration, which not only affects the quality of the whole coal mine exploration, but also causes huge security risks.

### Conclusion

Territorial survey is the basic work before the development of land resources. Improving the accuracy of the survey is conducive to improving the utilization rate of land resources. Digital surveying and mapping technology has a great impact on the land survey work, and also is the development direction of modern surveying and mapping technology. Therefore, digital surveying and mapping technology should be vigorously promoted to promote the process of digitization and modernization of territorial management.

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### *References:*

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