

Application of Digital Surveying and Mapping Technology in Engineering Surveying

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Abstract: with the development of science and technology of our country, the digital industry has been widely used in various fields, and achieved good results, and in the engineering survey in this field, the digital mapping technology has made outstanding contributions, it is one of the effective means of engineering measurement, and provides a great convenience for engineering survey. This paper discusses the application of digital surveying and mapping technology in engineering surveying.

In twenty-first Century, China has entered the era of digital information, all walks of life are from the tremendous impact of digital information technology. Engineering surveying industry is no exception, the application of digital surveying and mapping technology makes engineering surveying work more convenient, it not only makes the workflow easier, but also reduces the work intensity of the staff, and improves the quality of the engineering measurement. This paper expounds the advantages of digital surveying and mapping technology and the application of digital surveying and mapping technology in engineering surveying, and emphatically expounds the specific application strategy of digital mapping technology in engineering surveying, hoping to provide help for related workers.

1. The commonly used digital surveying and Mapping Technology

In the engineering survey, there are two main types of our most commonly used digital mapping technology, including map digital technology and digital mapping technology, we first map from digital technology to start, in the traditional engineering surveying work, the science and technology have not yet reached a certain level, so in the map scale in the production of Jiaotong University it is difficult to input, more accurate data. However, with the advent of digital map technology, this problem has been solved. We can use digital mapping technology, scanning vector instrument, good hand tracking digital technology, and enter more accurate data in large scale map. It can be said that through the use of digital mapping technology, can greatly improve work efficiency and quality of work. Digital mapping technology is also a widely used technology. In engineering surveying, the importance of Surveying and mapping is self-evident, in large-scale mapping of engineering surveying, the staff usually need to go to the field work. The field surveying and mapping work environment is more complex, and the working time is very long. Therefore, in surveying and mapping, if we can not complete the surveying and mapping work as soon as possible and obtain accurate data, there is no way to meet the requirements of customers in time. However, after the digital mapping technology emerged, surveying and mapping technology has been further developed, the staff of Surveying and mapping work is difficult to reduce, shorten the surveying and mapping time [1].

2. The advantages of digital surveying and Mapping Technology

With the development of modern science and technology, digital mapping technology appears and develops, and is widely used in today's engineering surveying. Compared with the traditional surveying and mapping technology, digital planning technology has obvious advantages. First, compared with the traditional surveying and mapping technology, digital mapping technology

makes surveying and mapping work more convenient. Through the use of digital surveying and mapping technology, we can more vividly and accurately display the mapping object. At the same time, the obtained data is more accurate, which allows the staff in the process of Surveying and mapping work, more time saving, but also to the greatest extent to avoid the traditional mapping work prone to inaccurate data problems. Second, compared with the traditional surveying and mapping technology, the accuracy of digital mapping technology is higher. The use of digital mapping technology requires a variety of modern high-tech equipment; these devices can obtain more accurate data information for the staff. At the same time, in the process of using surveying and mapping technology, we can automatically save three-dimensional coordinates, and then collect relevant data information on the basis of collecting points again. This step reduces the amount of error that is prone to errors in the acquisition process. And we need to know, after surveying and mapping data is collected, the staff need to calculate and analyze it. In the traditional surveying and mapping work, all rely on people to calculate and analyze. But because people will be affected by a variety of factors, it is particularly prone to computational problems. The digital mapping technology is to directly access the data information to the computer system, and then get the data after calculation and analysis. This not only saves the time of calculation and analysis, improves the work efficiency, but also reduces the error caused by human factors, and saves the cost for the enterprise. Third, the use of digital surveying and mapping technology for surveying and mapping workers is an excellent thing. Surveying and mapping work is usually carried out in the field, the environment is bad, poor living conditions. If using traditional surveying and mapping technology, surveying and mapping staff to undertake great workload, and surveying and mapping time is relatively long. But through the application of digital surveying and mapping technology, surveying and mapping workers can complete the surveying and mapping work in a short period of time, not only to ensure the quality of Surveying and mapping, but also to reduce their own pressure. At the same time, through the application of digital mapping technology, the data information is no longer need to be made into paper version, long-distance transportation, only need to make it in the form of electronic version for data transmission can be. This method not only avoids the problems of missing and missing data information which may appear in long distance transportation data, but also saves manpower and material resources. Fourth, compared with the traditional surveying and mapping technology, the application of digital mapping technology can be more accurate and detailed analysis of the mapping of topography and geomorphology. In the process of using digital mapping technology, the data of terrain and physiognomy can be directly input into the computer by computer simulation technology, and then the computer screen will be directly and visually reflected. The traditional mapping technology, the need to use a large number of symbols, numbers, etc., if the ability of staff is not good, it is difficult to understand mapping. But the application of digital mapping technology is convenient for the staff to look at the picture [2].

3. The specific application of digital surveying and mapping technology in Engineering Surveying

In the engineering survey, the staff need to draw the topographic map and engineering drawing. Especially in the drawing of topographic map, in the process of drawing, we must ensure the appropriate proportion, basically are large scale topographic map. This requires the staff to do a lot of field survey, and collect all the data information, in the calculation, analysis and processing of data information can be able to draw. It can be said that the whole drawing process is troublesome and takes a long time. In the current era of "speed", it is obvious that it is not possible. Therefore, with the support of science and technology, digital surveying and mapping technology has been widely used. Especially in the work of engineering surveying, it has created a new situation for it. Below we will specifically describe the application of digital mapping technology in engineering surveying [3]:

In engineering surveying, users often put forward higher requirements for measurement accuracy. Especially in large scale mapping, the ground data need to be measured, which is a relatively common method of measurement. It includes data acquisition, data processing, data calculation and

analysis, graphics drawing, output and other steps. This set of processes ensures the accuracy of Surveying and mapping data. Therefore, the ground digital mapping technology is widely used. In the process of digital soil survey technology, we can draw the map according to the different proportion according to the results obtained at a certain time, so that it can meet the different construction requirements, and also can avoid repeated operation. At the same time, in the process of data acquisition, the staff can use the digital mapping technology three point positioning method, this method can automatically collect, store and process the data of the measurement area. Moreover, this non human automatic mapping method can reduce the error caused by human factors, and further ensure the quality of the drawing. In addition, through the application of digital mapping technology, the data information can be stored permanently in the computer. If it is not deliberately damaged data, then you want to use it, you can find and apply in a timely manner [4].

In engineering surveying, digital mapping technology is used more. In the process of using this technology, the staff can choose according to the user's requirements. If the user's requirements for the digital topographic map is not very high, and the cost is also limited, then the digital mapping technology can be used. In this case, the value of the original image can be fully reflected. At the same time, workers can be assisted by computer scanning, all kinds of data input into the computer, and ensure that in the shortest possible time, you can use the original digital mapping technology to obtain the appropriate map information. Usually, there are two ways of digital mapping technology, one is scanning vectorization, which can ensure the accuracy to the maximum extent, and also can improve the work efficiency. The other is using hand tracking digital technology. Usually, when the condition permits, the staff can use the Scanning Vectorization Method, which can obtain the digital map, but this kind of digital map can be used, but it is lack of accuracy. And to get more accurate information, you need to use related assistive devices. Only in this way can the engineering surveying information be fully combined with the digital map. This way the data information on the map is more accurate [5].

3S digital mapping technology mainly includes three kinds, the first is GPS technology, the second is GIS technology, the third technology is RS technology. We specifically described below 3S technology, GPS technology, which is a very high precision positioning system, the technology used in engineering measurement, can play a very good measurement effect. It is not limited by external environmental factors, such as time, place, condition and so on, and it does not need a variety of auxiliary equipment, so it can obtain high precision surveying and mapping data. In the process of using GPS, the dynamic pile position lofting work should be carried out, and the position of Pile Lofting can be accurately obtained after completion. In addition, the most obvious advantage of using GPS technology is that it is not affected by measurement conditions, which is helpful to improve the efficiency of measurement. But in the actual operation process, we need to pay attention to the problem is to timely check the pile location, in order to ensure that the location of the pile will not appear centrifugal problems, which effectively ensure the orderly construction of the project. The application of GIS technology in engineering measurement is also more widely, this a technology involving multidisciplinary knowledge, it is through the computer technology to collect and collate the data information, and to analysis the data automatically stored. This technology is the most widely used in urban management and land planning. GIS technology can be used to vector analysis of objects, and the figure of position according to the collected data and the objective image through the computer screen show, at the same time will draw on the local environment and resource status scan, which is conducive to the staff for the first time to obtain information, is conducive to the construction plan the construction units for later. RS technology is often used in engineering surveying, RS technology is also called remote sensing technology, it has a large area of synchronous observation ability, can accept the observation object of all kinds of data information has changed information situation. And its biggest advantage is reflected in the comprehensive treatment of information differences in contrast. This RS technology is often used to observe the basic geographic information, can be understood through spectral resolution and the coverage of the National Chiao Tung University, to understand the change of terrain data information, it can be said that this technology plays a positive role in drawing urban topographic

map. So this technology has been widely used [6].

With the rapid development of China's social economy, China's geographic information system has been further developed and improved. It can be said that in the whole process, digital surveying and mapping technology plays a vital role. In surveying and mapping work, through the use of this technology, to ensure that the construction enterprise in the shortest possible time to obtain the most detailed data information. In the process of drawing, the application of geographic information system also provides the basic data information for digital mapping. In the construction project, it is necessary to carry out engineering surveying work, in order to ensure the accuracy of construction positioning, in this process, the application of global positioning technology. The appearance of the satellite positioning and mapping technology is an effective way of satellite positioning, which ensures the accuracy and comprehensiveness of the measured data.

4. Conclusion

In the process of the continuous development of science and technology, digital mapping technology should be born, and is widely used in many fields. Especially in engineering surveying, digital surveying and mapping technology has made outstanding contributions. It not only improves the efficiency of surveying work, but also improves the effect of engineering surveying work. Thus, in engineering surveying, digital surveying and mapping technology is difficult to replace the importance of location. And in the future, I believe that in engineering surveying, digital surveying and mapping technology will certainly have a further development prospects. In this environment, as the engineering surveying and mapping personnel must be strict with themselves, constantly learning, update their knowledge, improve their professional knowledge level, better work in the application of digital mapping technology, digital mapping technology will give full play to the role of. In summary, this paper firstly elaborates the current project most commonly measured as two kinds of digital mapping technology application, secondly describes the many advantages of application of digital mapping technology in the engineering survey, finally elaborates the application of digital technology in engineering measurement.

References

- [1] Li Zhuo. Analysis and application of digital surveying and mapping technology in geological engineering surveying [J]. science and Technology Innovation Herald, 2015,12 (30): 105-106.
- [2] Liu Jingqi. Research on Application of digital mapping technology in water conservancy engineering [J]. science and Technology Innovation Herald, 2016,13 (09): 30-31.
- [3] Wen Yue. Analysis of the application of digital surveying and mapping technology in engineering surveying [J]. scientific and technological innovation and application, 2017, (23): 152-153.
- [4] Cold. To digital mapping technology in the engineering survey of the application of [J]. technology and business, 2015, (21): 165.
- [5] Yin X P. Application analysis of digital surveying and mapping technology in Cadastral Surveying[J]. World Nonferrous Metals, 2017.
- [6] Liang Y X, Zhang Q M, Xie S L. Application of digital surveying and mapping technology in mine geological prospecting[J]. World Nonferrous Metals, 2017.

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