Application of Digital Surveying and Mapping Technology in Construction Engineering Survey

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Abstract: At present, digital surveying and mapping technology is one of the key contents of the scientific and technological innovation of Surveying and mapping enterprises. Only by doing a good job in the innovation and optimization of digital surveying and mapping technology and applying it in the construction engineering can we guarantee the improvement of the market competitiveness of enterprises. This paper explores the application of digital surveying and mapping technology in construction engineering survey, and analyzes the advantages of digital surveying and mapping technology in construction engineering survey.

1. Introduction

In the past, engineering survey usually served the construction, transportation, water conservancy and other industries, but with the continuous development of science and technology, the intelligent level of surveying instruments is more superior, and also prompted more industries to start to widely use digital surveying and mapping technology[1]. At present, along with the development of ground survey technology, digital mapping technology, quantity and remote sensing of photographic data, agent information technology and global positioning and other advanced technologies, the collection and mathematical of survey data have gradually realized digitization, real-time and automation, and constantly expanded the service field of engineering survey, so as to meet the needs of all aspects of society.

2. Advantages and Characteristics of Digital Mapping Technology

The real-time processing of relevant data with complex professional technology is the so-called essence of digitalization. Some real-time data can be obtained through computer analysis, and then the characteristics of these data can be displayed in a simple and vivid way. Usually 3D models or charts are used to show the geological and geomorphic information, which are used in construction engineering Digital technology can show the data of construction engineering survey more clearly. The application of digital surveying and mapping technology can change the traditional way of work and avoid the use of artificial paper to collect and process the data and information of engineering surveying. The workload is very huge[2]. At the same time, this kind of complex data can only be read and understood by professionals. The application of digital mapping technology can directly simplify the complex problems, and make the abstract geographic information more vivid and intuitive. With the constantly updated technology and equipment, the application of digital surveying and mapping technology has become more simple. As long as the surveying and mapping unit pays attention to the new surveying and mapping analysis software on the network regularly, it can achieve the effectiveness of product information and form the information updating mode synchronized with the market. Secondly, while updating the hardware facilities, we should also pay attention to updating the software of digital surveying and mapping technology, so as to make a strong guarantee for the effectiveness of digital surveying and mapping technology.

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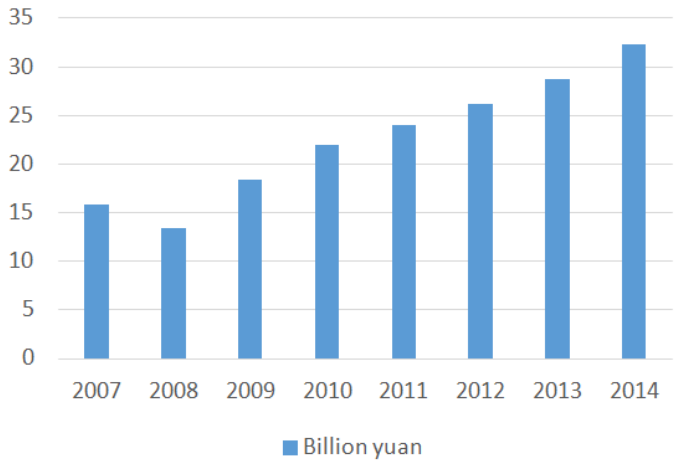

Figure 1 Market scale of China's surveying and mapping industry in 2007-2014

2.1. High Accuracy

Compared with other measurement technologies, digital measurement technology has higher accuracy. Compared with the traditional measurement technology, they are quite different. The accuracy of modern digital measurement technology has been greatly improved. In addition, digital measurement technology can effectively combine each intelligent technology with digital technology, which to a certain extent It can greatly improve the accuracy of measurement, effectively reduce the probability of error, so as to improve the accuracy and stability of digital measurement technology.

2.2. High Level of Automation

In the application of geographical measurement technology, automation technology, as a way of engineering measurement, plays a very important role in the measurement work. Digital measurement technology is based on the technology of computer, and then use computer to carry out the actual simulation work. With the help of computer, the real-time operation of terrain can be realized, the detailed analysis of terrain, landform and specific geological characteristics can be carried out, and the relevant data can be formed in time. In the digital measurement technology, the computer technology is applied to combine the two together to form an interdependent relationship, which can greatly improve the level of its intelligence, automation and refinement to a certain extent[3]. In the process of data processing and drawing, using digital measurement technology can effectively improve the work efficiency, and optimize the previous method with poor operability, which is conducive to improving the automation level of drawing.

2.3. Information Quantity

In the process of digital survey, the relevant workers need to fully grasp the terrain and cadastral conditions of the project, and then count the results as a reference data for planning, which can effectively help the workers to use the map to design and plan the computer project. Through the digital survey technology, the workers can according to the number obtained According to the analysis and statistics, then form a huge information database, which is of great significance for the measurement work.

2.4. Graphics Data Can be Updated in Time

There are some differences between the modern digital technology and the traditional way. At present, the surveying and mapping technology we applied can be used conveniently and quickly by computer. By this way, we can better ensure that the digital products keep the same development trend with the society in terms of information, and that the graphics and data can be updated in time, so as to promote the usability of graphics and data and make engineering measurement more convenient and quick.

3. Application Strategy of Digital Surveying and Mapping Technology in Construction Engineering Survey

3.1. Ground Mapping

The most common link in construction engineering is ground surveying and mapping. In the traditional operation process, many technical deficiencies will directly affect the results of ground surveying and mapping, and the efficiency and quality of ground surveying and mapping can not be fully assured. The application of digital mapping technology can effectively map the regional ground, and then form a larger proportion of the map, at the same time, it can fully show the obstacles and gullies in the regional ground[4]. Digital surveying and mapping technology not only has excellent data accuracy, effectively curbs the error of ground map surveying and mapping, and lays a good foundation for the quality of construction engineering surveying.

3.2. Mapping of Original Drawings

In the process of surveying some construction projects, there are often some mathematical and chemical phenomena

Because of the shortage of funds for topographic map, the surveying and mapping work is just a formality, and it is difficult for the surveying and mapping work to have sufficient funds to support its development. The application of digital lateral protection technology can effectively avoid this problem and save a lot of Surveying and mapping funds. Through digital software, scanning instruments, drawing instruments, computers and digital instruments, the automatic measurement of construction engineering can be carried out[5]. For example, in the process of Surveying and mapping by using scanning vector, the accuracy of the original drawing data of construction engineering can have a direct impact on the accuracy of the digital map obtained by surveying and mapping. The digital surveying and mapping technology can control this error to the greatest extent, compare the actual construction engineering with the original drawing, and get quite accurate surveying and mapping data. The application of digital surveying and mapping technology to the measurement of building engineering has faster measurement efficiency and accuracy. With the rapid development of science and technology in the current era, the application of scanners is more and more extensive, and the corresponding vector software is also constantly updated, and the degree of automation of construction engineering measurement is higher and higher.

3.3. Application of Digital Mapping Technology in Building Deformation Mapping

Digital surveying and mapping technology was first used in mining and quarrying industry, but with the continuous progress of the times, the development of science and technology makes digital surveying and mapping technology more advanced, and digital surveying and mapping technology is gradually applied by other industries. Digital imaging technology is one of the most widely used technologies in the construction industry. When the deformation monitoring of the building engineering is carried out, the digital imaging technology is applied, and the two-dimensional parameters detected are analyzed by computer, so that the settlement problem, overall inclination and position change of the building can be calculated quickly, based on which the objective evaluation can be carried out.

4. The Value of Digital Mapping Technology

4.1. Digital Mapping Improves Accuracy

As the current technology is in a stage of rapid development, the requirements and standards for work are becoming higher and higher. However, one of the advantages of digital surveying and mapping is that in the process of applying digital surveying and mapping technology, the level of modern mechanical intelligence has been gradually improved, resulting in fewer errors and errors, which are beneficial to support The popularization of digital mapping has been maintained[6]. In the current society, we should not only focus on quality issues, but also improve the efficiency of production and work with the help of digital work form to achieve more efficient work quality, so

as to promote the development of engineering measurement.

4.2. Digital Mapping is Convenient and Fast

In the current rapidly developing society, almost every industry is trying to obtain economic benefits, but at the same time, efficiency and quality should be taken into account[7]. On this issue, digital mapping technology can start from different aspects of engineering survey requirements by using advanced computer technology, and then comprehensively collect and analyze all data in the work, and then combine relevant theoretical knowledge with specific practical operation closely to promote the efficiency of engineering survey work, so as to achieve the requirements of work. At the same time, it can also greatly reduce the burden of engineering survey staff and fully demonstrate the advantages of digital technology.

4.3. Digital Mapping Can Improve the Level of Automation

Due to the continuous development of science and technology, the relevant staff in the use of computers have achieved the best use, many times need to use the help of digital technology to deal with problems. Because in the network database, people can transfer out and continue to carry out the work they need to complete at any time, so the development of science and technology has a favorable condition that it can reduce the number of labor force in a certain work[8]. Therefore, the application of digital mapping technology in engineering measurement can greatly improve the automation level of engineering measurement.

4.4. Digital Mapping Enriches Image Information

The application of digital mapping and surveying technology in engineering survey can make modern advanced computer technology realize its own value, and collect more and better image information in engineering survey[9]. It can not only display the engineering achievements conveniently and comprehensively, but also highlight the high standard requirements of digitalization in engineering survey.

5. Conclusion

In a word, the application of digital surveying and mapping technology in construction engineering survey is more and more extensive, which also reflects the advantages of digital surveying and mapping technology[10]. Compared with the traditional technology, digital mapping technology has obvious advantages, and can meet the needs of different customers at the same time. In the process of application of this technology, the relevant personnel should carry out continuous exploration, find and solve problems, find out problems in continuous practice, and find solutions in continuous problems, so as to promote the application level of digital mapping technology in construction engineering survey.

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