

Research on New Technology of Surveying and Mapping in Municipal Engineering

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Abstract: With the rapid development of new city construction, municipal engineering construction is related to the level of urban modernization reform. In urban construction, the effective implementation of municipal surveying and mapping is an important link. Only by effectively utilizing high intelligent technology can we better complete the urban construction and transformation project, promote the development of urban construction, and effectively implement it.

Keywords: Municipal surveying and mapping; Municipal engineering; Urban construction; Research

1. Introduction

Urban municipal construction is related to the level of regional comprehensive development. In order to improve the facilities of municipal planning projects, it is necessary to carry out regular activities of political planning and transformation to ensure that regional infrastructure conforms to the level of urban development. Facing the shortcomings of traditional municipal surveying and mapping, it is necessary to establish a complete technical system to introduce high-end science and technology to support the implementation of Surveying and mapping operations. 3S technology is the key technology in current engineering transformation. It has strategic significance to use 3S technology in resource planning and transformation. Surveying and mapping units need to flexibly apply technology to assist on-site surveying and mapping.

Communications, gardens and other projects have promoted the transformation of regional infrastructure. Facing the shortcomings of traditional municipal surveying and mapping, building a new intelligent technology system is the trend of development, and it can also reduce the difficulty of manual participation in surveying and mapping operations. 3S technology is a high-tech product of modern municipal surveying and mapping. It integrates remote sensing technology (RS), geographic information system (GIS) and global positioning system (GPS), and achieves integrated control applications of information collection, processing, management, analysis, expression and dissemination. In the future, the demand for introducing intelligent technology into urban construction and transformation will continue to increase. According to statistics, in 2018, the global geographic output value of Surveying and mapping is estimated to be about 300 billion US dollars, with an annual growth rate of more than 14%. The estimated output value of Surveying and mapping information in China exceeds 620 bil-

lion US dollars, which fully illustrates that intelligent surveying and mapping technology will become the dominant trend of industry and market. Municipal engineering has not yet established a complete organizational structure, and the work of internal power checks and balances has not yet been completed, which will inevitably lead to the disorder of intelligent mapping process, which is not conducive to the adjustment and implementation of economic strategic decisions. Municipal engineering surveying and mapping system is not perfect enough, and there are many problems in organizational structure, staffing, management mode, etc., which lead to organizational structure in surveying and mapping management has not yet formed a good situation, affecting the planning and development of the whole management system.

2. Application of New Mapping Technology in Municipal Engineering Survey

2.1. Geographic information system

Geographic Information System (GIS) is abbreviated as GIS technology. Geographic information system (GIS) is based on surveying technology and mapping. It can acquire and process geographic information in real time by computer software. Geographic information system combined with database technology can also have the function of information storage. The application of Geographic Information System (GIS) in municipal engineering surveying can realize the effective management of spatial geographic information, and use a unified management system to comprehensively process various types of municipal functional information. Different departments can browse all data information within their jurisdiction in GIS. Geographic information system not only has the function of comprehensive data processing, but also can query and analyze data in any space. The data of municipal engineering information is very complex. The workload and accuracy of manual observation alone are very

large. Geographic information system can automatically classify data, generate analysis charts, and even overlay multi-map analysis.

2.2. Remote sensing technology

Remote sensing technology, also known as RS technology. Remote sensing technology collects and analyses surface information by collecting electromagnetic waves emitted or reflected by various objects on the earth's surface received at high altitude. In municipal engineering surveying, the recognition of surface materials by remote sensing technology is mainly realized by identifying the gap between objects' response to Popper. In addition, remote sensing technology can also generate topographic maps for people's reference. Remote sensing technology has the advantages of low measurement cost, short measurement time and high measurement accuracy, so it is widely used in meteorological prediction and hydrological detection. Surveyors' municipal engineering surveying work fully combines remote sensing technology with computer software, and can carefully check each data obtained from surveying, so as to minimize the data errors in surveying. After the completion of the municipal engineering survey, it can check whether the details of the drawings meet the requirements, ensure the accuracy of the municipal engineering survey work, and provide scientific data guidance for subsequent construction. The combination of remote sensing technology and global positioning system can realize the automatic transmission, storage and analysis of data, and ultimately obtain accurate surveying maps, which fully meet the needs of municipal engineering surveying. If the field verification is carried out after obtaining the change information, the accuracy of the internal industry can be monitored comprehensively. At the same time, the information collected by the field can be automatically transmitted to the electronic archives, which greatly improves the efficiency of the municipal engineering survey work.

2.3. Aerial photogrammetry technology

With the development of information technology, photography technology has developed to the stage of intelligent measurement. Aerial photogrammetry technology has been based on the measurement technology to collect and analyze the relevant information of the target. The combination of image technology and computer information technology has changed the traditional imaging mode of measurement work. Data processing has replaced the conventional indoor image. This image analysis and processing method greatly improves the efficiency of municipal engineering surveying, and significantly improves the measurement accuracy. Aerial photogrammetry technology can be used to make large-scale cartographic skips in crowded areas, which provides an important reference for urban planning and construction,

and greatly reduces the cost of manpower and material resources in municipal engineering surveying.

3. Application of New Municipal Surveying and Mapping Technology

3.1. Technology for municipal surveying and mapping

3S technology changes the traditional division of labor mapping mode, systematically arranges municipal engineering modules, upgrades and reforms them according to municipal structural standards, and improves the level of Surveying and mapping in the whole region. For example, from the air to the ground, from the ground to the underground, from two-dimensional to three-dimensional, from outdoor to indoor, in a nutshell, modern surveying and mapping geographic information pursues "rapid acquisition, processing and good application of geographic information using various technologies", its essence is the integration of spatial geography. With the development of big data, cloud computing, artificial intelligence, Internet of things, virtual reality, augmented reality and automation, the frontier technology of Surveying and mapping geographic information develops synchronously. Intelligent control is realized by using 3S technology, which can reduce the error rate of manual operation and ensure that the acquired data information meets the actual requirements of measurement and control. 3S big data is the technology that has the greatest impact on surveying and mapping geographic information. It has far-reaching impact on the storage, processing and analysis of a large number of structured and unstructured data in surveying and mapping geographic information. Artificial intelligence has become an important tool in the field of Surveying and mapping geographic information prediction model, navigation and positioning, and earth observation after large data. The development of the Internet of Things has made the market navigate and positioning. The demand for navigation and positioning technology has increased dramatically, which improves the application efficiency of navigation and positioning technology. Municipal Engineering Survey needs data not only on the ground, but also underground in many cases. In our country, the surveying and mapping technology of surveying underground data is mainly plane control surveying technology, but the accuracy of this technology is not high enough, and there is great room for improvement in the application of municipal engineering surveying. The technicians should reasonably calculate the length of the traverse, plan the measurement well in advance, work out a scientific audit plan, select the appropriate measurement method, apply the measuring equipment with good performance, analyze and measure the object in many ways, and finally ensure that all the key points of the object can be expressed in the plan.

4. Concluding Remarks

Municipal engineering is devoted to urban reconstruction and construction. It is necessary to compile surveying and mapping operation mode from the perspective of information technology, so as to improve the strategic planning objectives of the whole region. Based on 3S technology platform, a set of intelligent surveying and mapping system is compiled to meet the development needs of municipal engineering, which provides a scientific direction for intelligent surveying and mapping and management. In order to improve the level of intelligent information management, it is necessary to carry out the strategic reform plan according to the intelligent mapping and improvement system, and from the perspective of management, so as to meet the needs of project management and operation.

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