Research on the Integration of Big Data and UAV Technology to Help the Development of Low-altitude Economy——Based on the Perspective of Professional Group Construction and Industry-Education Integration

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Abstract: The promotion of the integration of big data and UAV technology on the development of low-altitude economy is deeply investigated in this study. The research status, technology development process and practical application cases at home and abroad are the focus of analysis. The establishment of the innovation path depends on the construction of professional groups and the integration of production and education. The concept covers the integration of educational resources, school-enterprise cooperation, training base construction and teacher team expansion and other strategic details. The conclusion can be drawn that the deepening of the integration of industry and education will help improve the standards of talent training and lay a solid foundation for the progress of the industry.

Keywords: big data technology, UAV technology, low-altitude economy, integration of industry and education, talent training

Introduction

The rapid development of science and technology has led to the wide application of big data and UAV technology, and the great potential has been reflected in the field of low-altitude economy. The formation and expansion of low-altitude economy depends on the development and utilization of low-altitude resources. We will explore how can the integration of big data and UAV technology boost this emerging economic model, and focus on analyzing the role of professional group construction and industry-education integration in innovation and industry promotion. Combined with theoretical research and case analysis, a feasible and promising solution and future development roadmap are formulated to provide theoretical basis and practical guidance for promoting the high-quality development of low-altitude economy.

1. The integration status of big data and UAV technology

1.1 The development history of related technologies

One of the results of the outbreak of data in the Internet era, big data technology comes from this. This technology has spanned multiple stages: from data acquisition to storage, and then to processing and analysis. In the past, it was limited to structured data processing, and now it has developed to unstructured data mining and analysis. It can be clearly seen that it

is gradually maturing. The application of UAV technology in the military field of alternative origin. After years of rapid development, it has quietly expanded to the civilian field. Early used in simple aerial photography technology, and has evolved to have automatic flight control, obstacle avoidance technology and intelligent data acquisition and other functions, and UAV technology has also achieved leapfrog progress. In recent years, with the emergence of emerging forces AI technology and Internet of Things in the science and technology industry, it has become inevitable to breed a fusion scheme between large numbers and drones, which effectively improves the accuracy in depth.

1.2 The existing cases and practice of integrated application

The unique advantages have been shown in many fields in the integration of big data and UAV technology. Combining these two technologies, the realization of efficient data acquisition, transmission and analysis is theoretically achieved. Taking urban management as an example, drones collect data on traffic flow and environment in real time, and support big data platforms for analysis and processing - intelligent urban management has gradually surfaced. In the field of agriculture, drones that monitor farmland in an all-round way and big data technologies that facilitate the interpretation of crop growth give the possibility of accurately formulating planting plans and fertilization schemes to increase agricultural output. In the field of logistics, it is no longer a problem to effectively improve the quality of logistics services and reduce operating costs by relying on drones that optimize routes and perform distribution tasks based on big data[1].

2. The innovation path based on the construction of professional group and the integration of industry and education

2.1 Educational resources integration and curriculum system reform

The resources of universities, scientific research institutions and enterprises can be integrated to build a multidisciplinary curriculum system, and hone students' comprehensive application ability. The basic theory of big data and UAV technology covers the curriculum system, but not only this, but also combines the development of cutting-edge technology to strengthen the practical operation technology. The knowledge framework is designed under the guidance of the provided theoretical guidance, which includes the basic principles of big data processing and analysis, UAV flight control technology and various data acquisition methods. And ensure that it is systematic so that the modules can be naturally connected, and gradually evolve into a complete cognitive framework, and continue to improve with emerging technologies. The introduction of virtual simulation into teaching can increase the practice training of the real operation scene in the teacher circle, so as to improve the educational effect. The situational experiment of carving key points can enable the students to think deeply about the clues of the world law. In order to make the instilling education usher in interactive inquiry and promotion, encourage students to participate in discussion and independent learning, and cultivate their innovative thinking and problem-solving ability, schools and enterprises should work together to build advanced training bases and give students rich hands-on opportunities. For example, the "UAV Big Data Application" course was successfully developed by Zhejiang University in collaboration with several well-known enterprises, and made full use of the course content to connect with real project challenges. An example was found in the field monitoring project: the team was composed of several students, playing the role of drone flying hand, conducting multiple cruise missions above the designated farmland airspace, collecting the growth data of crops in different time periods and then uploading them to the big data platform for processing and in-depth interpretation. In this way, by observing, comparing and analyzing the changing trend of crop conditions in each stage, the image of 'play' UAV technician also increases the ability of question and answer monitoring and planning management by using big data technology[2].

2.2 Innovation and practice of school-enterprise cooperation mode

Establishing a cooperative relationship with industry leading enterprises and developing courses and training projects simultaneously can significantly improve students' practical ability and employment competitiveness. In-depth communication covers multiple levels such as curriculum design, project implementation, and education workers' training,

so as to achieve seamless docking in addition to resource sharing between schools and enterprises. In this process, colleges and universities need to introduce real enterprise cases and combine academic research to form a teaching model that closely connects theoretical knowledge and on-site experience ; it is the responsibility of enterprises to open resources and build technical support and operation platform. Doing so not only enables companies to devote themselves to the education process, but also to focus on cultivating outstanding talents with both innovative spirit and operational skills. More importantly, this kind of school-enterprise needs to pay attention to long-term mechanism construction, and regularly evaluate and adjust various plans to ensure that all things within its coverage have their effectiveness and continuity. Alibaba and South China University of Technology are working together to build a UAV-based logistics distribution system development project. Optimizing logistics paths and improving distribution efficiency aim to apply UAV technology and big data analysis. Setting up a project team, integrate Alibaba's technical team and school teachers to develop a detailed technical plan. Lead students into the classroom to conduct in-depth research and mastery of logistics management, drone operation, and big data. After that, in the laboratory set up by Alibaba, participate in the real operation simulation flight according to the group mode and complete the data collection. Each group has its own task: part is responsible for flight control; part is responsible for processing the collected data; the other part is responsible for path optimization and overall system design. In this process, at any time from Ali online shopping platform engineers to follow the students on-site guidance, and strive to solve the practical problems encountered by them[3].

2.3 Training base and platform construction

Advanced technical facilities and diversified application scenarios add color to the training base; here, students can conduct systematic internship training in a real environment[4], introduce industry standard equipment and tools, train the basic operation of drones, and deeply explore the practical benefits of big data processing. Moreover, it is necessary to integrate enterprises, formulate courses and planning projects according to the needs of the industry, and promote the education content to keep up with the market demand. In the training environment under this grand blueprint, students enjoy their innovative thinking and teamwork spirit, and build a solid foundation on the future career development path. The birth of the UAV training base originated from the joint efforts of a university and a UAV technology company. Its research focuses on the application of big data in agricultural monitoring.

The students received a series of practical tutorials involving drone operation and data acquisition training. They devoted themselves to a specific farmland monitoring project, using drone flights to collect information such as soil moisture, temperature, and crop growth over multiple time periods. Enterprise science and technology experts are responsible for guiding students to develop accurate flight plans and record relevant data, so as to ensure that the entire data collection process follows scientific and normative principles.[5] These are carefully entered into the system, and uploaded to the big data platform requires in-depth analysis and processing. For all the huge and complex information collected, students will use statistical software to process it, and finally generate an analysis report, in which they will put forward suggestions for solving farmland management problems.

2.4 Teaching staff construction and talent training

The existence of high-level teachers is not only the source of solid theoretical knowledge, but also the fire of innovative thinking. Therefore, scientific and perfect teacher training mechanism and regular professional seminars and technical exchange activities are very important in colleges and universities. This not only makes teachers with strong professional quality and practical ability, but also helps them keep close track of the latest technology and industry trends.[6] At the same time, in the spirit of inspiring and inspiring people, they actively participate in various scientific research projects, and raise the experience and teaching fit to a core position, so as to open up a broad field of knowledge for students in a more cutting-edge and more authentic way. After the signing of a long-term cooperation agreement between a university and a well-known drone manufacturing enterprise, a teacher training program was launched. The program includes regular expert guidance, and the learning content does not cover courses such as the latest drone technology, application cases, and data analysis methods. During the one-week field operation training, all participants received expert

guidance and conducted data collection and analysis.

3. Conclusion

The integration and application of big data and UAV technology has played a profound role in the development of low-altitude economy. This study makes an in-depth analysis of this. The integration of production and education and the construction of professional groups have been emphasized as an important means to improve the quality of education. Based on the research and practice at home and abroad, the strategy is put forward from the concrete place - school-enterprise cooperation, training base construction, etc., aiming at cultivating high-quality talents. With the pace of future technological progress, various industries will see that this integration brings more innovation opportunities and promotes the sustainable development of the economy. Therefore, investment in related fields must continue to increase efforts to achieve the goal of deeper coordinated development by promoting the combination of theory and practice.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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