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(57) Abstract :
The agricultural landscape is evolving rapidly with the integration of modern technologies, and one such transformative approach is the implementation of a Cloud-Based Agricultural Information System for Remote Farm Monitoring and Management. This system leverages a basic cloud platform architecture designed to streamline network monitoring in modem agriculture. The core of the system is built upon a RESTful interface service provided by a cloud platform, complemented by Ext client technology and WeChat integration at the application layer. This collaborative technological framework forms the foundation of a Demo system, showcasing its potential application in agriculture network monitoring. The system assumes the role of a centralized digital data store, collecting information from diverse sources, including audio, video, image, text, and digital maps, to provide real-time insights. Referred to as smart farming, this technological combination empowers various stakeholders in agriculture to analyze plant-related data in real-time, thereby enhancing profitability and operational efficiency with minimal manual intervention. The system caters to the needs of farmers by incorporating features such as Internet of Things (IoT), weather observations, and Restful API, with a comprehensive set of sensors including those for monitoring pump status, solenoid valvé activity, humidity, and temperature. The integration of IoT, Wireless Sensor Networks (WSN), and Cloud technologies facilitates the seamless flow of daily observations, weather data, and other relevant information into the cloud-based infrastructure. This data, characterized by its volume and variety, undergoes processing and analysis through a well-designed big data module. The system prioritizes the efficient handling of large datasets, ensuring scalability and adaptability to diverse agricultural environments. In practical terms, the Cloud-Based Agricultural Information System acts as a catalyst for smart farming, enabling real-time decision-making based on a holistic understanding of farm conditions. Despite the existence of precision agriculture methods developed by academia and businesses, the scalability and applicability of these strategies to all farms have remained a challenge. This system, with its custom semi-public big data processing infrastructure, addresses this challenge by serving as a versatile foundation for various- precision agriculture applications. In conclusion, the Cloud-Based Agricultural Information System for Remote Farm Monitoring and Management represents a paradigm shift in agriculture, empowering farmers with advanced technology to optimize their operations. The integration of cloud computing, IoT, and big data analytics not only enhances data-driven decision-making but also contributes to the sdstainable development of agriculture by minimizing resource usage and maximizing output.

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