

nue was 250 billion yuan, driven by innovation in e-commerce, cloud computing, and digital media. Baidu's Q3 2024 revenue was 38 billion yuan, with continuous investment in search engines, AI and autonomous driving.

The IT industry's attractiveness continues to increase, with the number of employees expected to exceed 7,5 million in 2025, and an average annual salary of 195,000 yuan, ranking first among all industries. The industry's development is highly dependent on high-quality talents, with increasing demand for professionals skilled in AI, big data analysis, cloud computing, and network security. Educational institutions and enterprises are working together to cultivate and attract outstanding talents to meet market demands.

China's IT market is poised for continued growth and innovation, supported by government policies, technological advancements and strong market demand. As digital transformation accelerates across various sectors, the IT industry will play a crucial role in driving economic development and improving national competitiveness. With ongoing investments in research and development, infrastructure construction, and talent cultivation, China is expected to maintain its position as a global leader in the IT market.

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APPLICATION OF BIG DATA IN IT PROJECT MANAGEMENT

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Abstract. IT projects are characterized by volatility, timeliness, and high risk. With the increasing scale and complexity of projects, higher requirements are imposed on management efficiency and quality. The development of big data technology offers a new approach to IT project management. By introducing big data technology into the IT project management process, resource optimization, risk prediction and monitoring, as well as project progress tracking can be achieved. This facilitates

the transition of IT project management from experience-driven to data-driven practices, thereby enhancing project success rates.

Keywords: big data technology, IT project management, application.

Project management plays a critical role in modern enterprises by enhancing resource utilization efficiency and strengthening economic competitiveness. As digital transformation accelerates, IT projects have emerged as the core engine driving corporate innovation, with their management effectiveness directly determining the realization of organizational strategic objectives.

Industry reports and academic studies reveal that IT project cost overruns remain prevalent [1]. A study by McKinsey and the BT Centre for Major Programme Management at the University of Oxford reports that on average, large IT projects run 45 percent over budget [2]. Cost overruns can plunge organizations into extreme difficulties and even lead to project failures, demonstrating the severe challenges faced by traditional project management models. It is worth noting that the breakthrough development of big data technology provides a new possibility for reconstructing the project management methodology, which is to build a data-driven intelligent decision-making system to realize the accurate perception, dynamic optimization and forward-looking prediction of all elements of the project.

1. Key Issues in IT Project Management

IT project management is the set of activities that include planning, organizing, coordinating, controlling, directing, leading and innovating IT projects to meet customer requirements with limited resources. While IT project management falls under the broader domain of project management, its uniqueness lies in characteristics such as the volatility of requirements, timeliness, and high-risk nature inherent to IT projects [3, P. 3–4]. In today's rapidly evolving market environment, IT project management faces unprecedented challenges. Project scales continue to expand, complexity intensifies, and demands for management efficiency and quality grow increasingly stringent. Consequently, a critical issue emerges: traditional project management methodologies struggle to meet the needs of modern projects.

2. Application of Big Data Technology in IT Project Management

In the context of the digital-intelligence era, the development of big data technology has profoundly impacted diverse fields such as financial

risk control, drug development, urban traffic planning optimization, product quality control, and integrity monitoring and early warning [4–6]. Big data technology encompasses a suite of techniques and methodologies designed to process, analyze, and manage large-scale, diverse, and rapidly generated data. Its core tasks include data collection, storage, processing, analysis, and visualization.

IT projects are generally characterized by long cycles, high complexity, strong specialization, and dynamic human resource requirements. In traditional IT project management, resource scheduling often relies on managers' experiential judgment. However, when faced with dynamically evolving development tasks and cross-functional team collaboration, the inherent lag and subjectivity of manual decision-making become evident. A report by the Standish Group indicates that approximately 70 % of global projects failed to be delivered on schedule in 2020, with a key reason being managers' inadequate scheduling of tasks and developer resources [7]. The integration of big data technology offers a new pathway for resource optimization. By aggregating historical project data, developer skill tag libraries, and real-time task progress information, predictive models for resource scheduling can be constructed. Systems can automatically parse requirement documents using natural language processing (NLP) and intelligently match tasks with developers based on historical performance metrics such as code submission frequency and defect resolution cycles. To address the volatility of requirements, big data technology enables proactive demand prediction through multi-dimensional data fusion. Machine learning models leveraging user behavior logs, industry trend data, and competitor iteration information can identify potential requirement changes in advance.

The integration of big data technology throughout the entire lifecycle of IT project management, as illustrated in fig. 1, facilitates a transformation from experience-driven to data-driven project management.

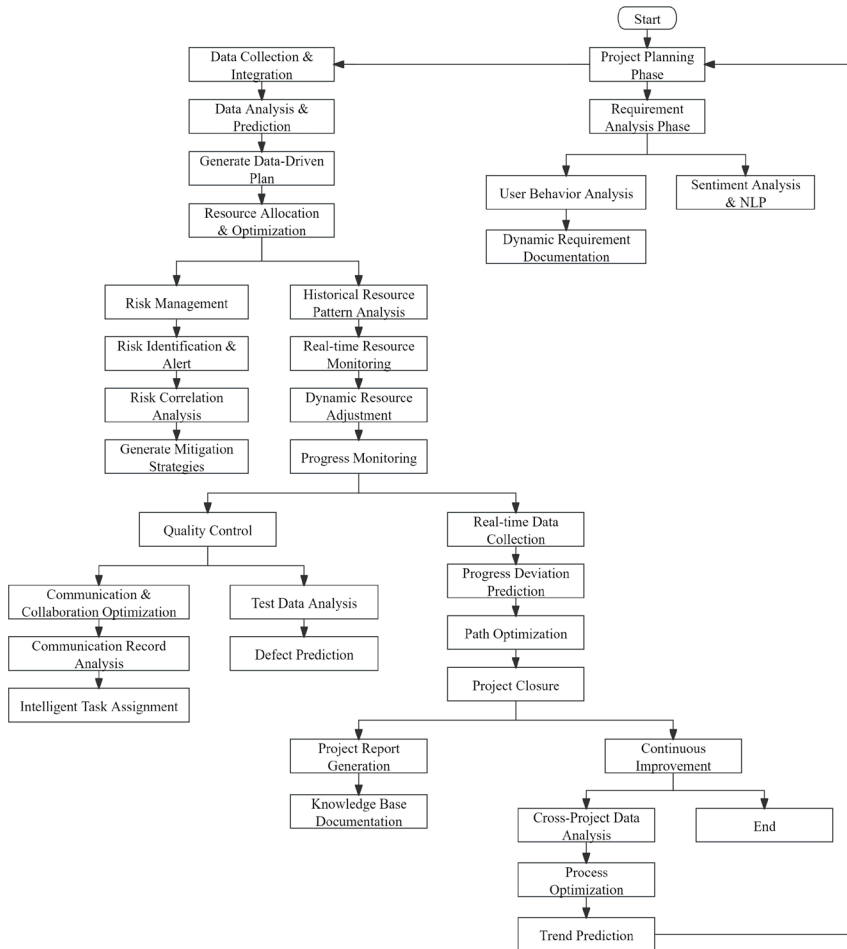


Figure 1 – Flowchart of big data technology embedded in the IT project management lifecycle

Conclusion

The introduction of big data technology signifies a fundamental transformation in management paradigms. By developing resource scheduling prediction models, enabling preemptive analysis of demand changes, and implementing end-to-end data integration, big data technology effective-

ly addresses the latency and subjectivity inherent in manual decision-making, thereby enhancing the precision of resource allocation and the responsiveness to evolving requirements. The adoption of big data in IT project management not only mitigates project delay risks but also strengthens organizational agility through data-driven continuous optimization. Looking ahead, with iterative algorithm improvements and the maturation of data ecosystems, big data technology is poised to unlock greater potential in IT project management, emerging as a core engine for enterprises to achieve efficient innovation and sustain competitive advantages.

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