

The Impact of Tencent's Digital Technologies on the Digital Transformation of Enterprises in Other Industries

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Abstract. Accelerating digital transformation is an important strategic task during the "14th Five-Year Plan" period to build a strong network nation and a digital China. Among these, enterprise management is also profoundly affected by digitalization. It is evident that digital transformation imposes high demands on enterprises, compelling them to keep pace with digitalization; otherwise, they are likely to lose their competitiveness. In terms of foundational technologies, Tencent employs a hybrid cloud architecture, combining on-premise deployment, private cloud, and public cloud IT infrastructure models to provide flexible, portable, and cost-effective solutions, laying an extremely solid foundation for innovation. At the data level, Tencent has established the Wemake big data platform in collaboration with numerous enterprises to ensure the efficient transmission and utilization of data assets, providing enterprises with broad and highly efficient methods for innovation. At the application level, Tencent utilizes integrated IoT development platforms like Lot Explorer and low-code platforms (such as Wanying Platform) to offer one-stop device intelligence services for users across various industries. However, challenges remain, such as fragmented and complex quality inspection standards, information security issues, and significantly increased costs of information transmission between departments. To address these, this paper proposes solutions such as establishing enterprise-level data governance standards, creating a "Digital Transformation Office" directly managed by executives, conducting regular permission audits, and promptly revoking old permissions when employees change roles. These measures aim to help enterprises avoid these problems, providing low-cost and high-efficiency channels for innovation and encouraging innovative practices.

Keywords: Technology, Digital Transformation, Tencent.

1. Introduction

In recent years, technologies such as the internet, big data, cloud computing, artificial intelligence, and blockchain have accelerated innovation and become increasingly integrated into all aspects of economic and social development. Major countries and regions around the world are speeding up their strategic plans for digital transformation. Since the launch of the Digital Transformation Partnership Initiative in 2020, digital transformation has become the primary development direction for various industries. This is a crucial step to ensure the high-quality development of the national economy and an essential way for enterprises to maintain and sustain their development in the new environment. Tencent has made significant progress in artificial intelligence. AI tools like DeepSeek have greatly promoted development across various industries. Tencent AI Lab's research on the single-cell annotation model scBERT, which introduced the BERT paradigm of large language models into the field of single-cell sequencing for the first time, has deeply integrated Tencent's AI technology into the biopharmaceutical industry, setting a remarkable example for cross-industry application of technology [1]. Today, leveraging its profound Technology accumulation in cloud computing, big data, artificial intelligence, blockchain, and other fields, Tencent provides robust digital infrastructure support for other industries. Existing research has also expect the future trends of Tencent's technology in the digital transformation of other industries [2]. Among these, the deep integration of AI and digital twins is considered an important direction. By using AI to drive decision-making and digital twins to achieve full lifecycle management, enterprises can further enhance operational efficiency and management levels [3]. Additionally, the rise of platform-based transformation and subscription models will accelerate the popularity and deepening of digital

transformation. As a leading enterprise in the industry, Tencent will continue to leverage its technological advantages and ecosystem-building capabilities to promote the construction of a Global Intelligent Ecosystem and provide resource support to enterprises unable to undergo their own digital transformation [4,5]. For example, Tencent Cloud helps enterprises quickly adjust resource allocation through flexible computing, storage, and network resources, enabling efficient system operation and reducing IT costs. How Tencent promotes the digital transformation of other industries is a key question today, as it can provide specific guidance to enterprises on how to successfully achieve digital transformation with Tencent's assistance.

2. Technical Support and Applications

2.1. Foundational support in terms of foundational

technologies, Tencent employs a hybrid cloud architecture that combines on-premise deployment, private cloud, and public cloud IT infrastructure models. This provides flexible, portable, and cost-effective solutions. By integrating computing power through this architecture, Tencent offers sufficient computing resources for enterprise innovation and delivers low-latency computing solutions. For small enterprises, digital transformation's impact on innovation is constrained by resources and technology, areas where Tencent can provide support [6]. Tencent's AI capabilities have achieved large-scale application in industrial quality inspection scenarios, particularly excelling in discrete manufacturing industries such as 3C. In the latest IDC report, Tencent Cloud Intelligence ascend the top three in the industrial AI quality inspection industry within just two years. Tencent has also explored "Full-Real Connected Digital Factories" with the steel industry, leveraging game engines and edge computing capabilities to ensure that the total time from data collection and computation to rendering on production lines is within 100ms. This allows management personnel to monitor production line operations in real-time through the full-real interconnected digital system. Additionally, with support from data centers in 26 geographical regions worldwide, Tencent provides assistance to fields such as cross-border e-commerce and game go abroad, laying an extremely solid foundation for innovation.

2.2. Data Support

At the data level, Tencent has established the Wemake big data platform in collaboration with numerous enterprises to ensure the efficient transmission and utilization of data assets. Tencent believes that the essence of the industrial internet is an efficiency revolution, enhancing enterprises' connection efficiency, data efficiency, and decision-making efficiency. The fundamental approach is to apply industrial internet technologies to achieve connected networking, business digitization and dataization, and intelligent decision-making, thereby significantly improving enterprises' external environmental perception capabilities, customer response capabilities, and agile innovation capabilities. To date, the Wemake platform has served 430,000 manufacturing enterprises, covered 26 industries, opened 5,000 industrial APPs, accumulated 5,300 industrial models, and connected 3.5 million devices, comprehensively assisting the digital transformation and upgrading of the manufacturing industry [7]. In terms of network construction, Tencent Cloud infrastructure not only covers economically developed regions such as Beijing-Tianjin-Hebei, Yangtze River Delta, and Guangdong-Hong Kong-Macao Greater Bay Area but also actively aligns with the national "East Data West Computing" strategy to optimize data center layout. Cloud data center in places like Gui'an New Area and Zhangjiakou in Inner Mongolia have been successively put into operation. This provides enterprises with broad and highly efficient methods for innovation.

2.3. Application Practices

At the application level, Tencent utilizes integrated IoT development platforms like Lot Explorer and low-code platforms (e.g., Wanying Platform) to offer one-stop device intelligence services for users across various industries. The platform provides massive device connection and message

communication capabilities, leveraging Tencent's mini-program application development capabilities, audio-video capabilities, and AI value-added services, while integrating Tencent's ecosystem content capabilities [8]. In industrial quality inspection, Tencent Cloud's TI-AOI platform integrates optics, machinery, electronics, software, and computing to deliver an integrated industrial AI quality inspection solution. This ensures that the total time for data collection and computation on production lines does not exceed 100ms, enabling customers to advance related projects with short cycles and low usage thresholds. The IoT development platform offers official mini-programs and SDKs for Tencent Connection, allowing users to quickly build applications for consumer IoT scenarios such as smart homes, smart locks, IPC cameras, and real-time audio-video without focusing on underlying implementations. This significantly improves application development efficiency and helps users create differentiated consumer experiences [9]. The platform provides one-stop device intelligence services for equipment manufacturers, solution providers, and application developers across various industries based on IoT. It offers massive device connection and management capabilities, mini-program application development capabilities based on Tencent Connection, and integrates Tencent Cloud's foundational products and AI capabilities while aggregating Tencent's ecosystem content capabilities. This enhances the efficiency of device intelligence in traditional industries and reduces development and operational costs for users, providing low-cost and high-efficiency channels for innovation and encouraging innovative practices.

3. Related Issues

3.1. Inconsistent Quality Inspection Standards

However, in the context of digital transformation, the connections between enterprises and related quality inspection standards are complex and fragmented. Overly complex standards may slow down the interaction and information transmission between enterprises to some extent. To address the issue of inconsistent quality inspection standards, enterprise-level data governance standards can be established. A master data management system can be used to unify indicators such as material codes and quality inspection parameters, avoiding information distortion caused by differences in foundational data.

3.2. Severe Information Security Situation

In today's era of strong IoT development, cooperation between enterprises is becoming closer, and the difficulty of obtaining data information has significantly decreased. This makes information data security paramount, with requirements for data security greatly increased. At the data security level, data information can be encrypted using algorithms such as AES-256 and SM4 to ensure that even if data is stolen, it is difficult to read. Secondly, data access must be assigned permissions based on roles, with regular audits of permissions. Old permissions should be promptly revoked when employees change roles to prevent permission redundancy. Additionally, assessment and accountability mechanisms should be improved, incorporating security indicators into performance evaluations and clearly holding those responsible for negligence accountable. At the same time, regulations such as the "Data Security Law" and "Personal Information Protection Law" should be strictly followed, with rigorous reviews in areas such as user authorization for collection, cross-border data security assessments, and data retention periods.

3.3. Difficulties in Departmental Communication

As enterprises become more closely connected, effective communication between departments under different enterprise frameworks has deteriorated sharply due to the increasing number of departments, significantly raising the cost of information transmission between departments. To improve communication between departments, a "Digital Transformation Office" directly managed by executives can be established to coordinate goals and resource allocation between departments,

ensuring strategic consistency. Additionally, a "Dare to Collaborate Handbook" can be created to clarify connection rules and response expectations for various scenarios.

4. Conclusion

This study can use Tencent's technical support for other industries as an example to potentially reduce the theoretical barriers to digital transformation for enterprises and, to some extent, provide support for the efficiency of enterprise digital transformation. Through research, it has been found that Tencent has increasingly focused on the development of digital technologies in recent years. Tencent's AI capabilities have already made substantial contributions to businesses such as performance advertising and evergreen games. Moreover, Tencent continues to invest in new AI opportunities, such as Yuanbao applications and AI within WeChat. Tencent's advanced technologies, through integration with various industries, are gradually penetrating multiple sectors. Foundational technical support lays a solid foundation for the digital transformation of industries. Leveraging the advantage of Tencent's vast database, it also provides massive information for other industries to improve themselves and undergo digital transformation in better conditions. At the application level, the rich and mature various software and applications significantly lower the threshold for digital transformation in other industries. However, issues such as inconsistent quality inspection standards, data security, and difficulties in departmental communication were also identified. To a certain extent, feasible methods for these problems were proposed. Tencent's technologies can indeed help enterprises in other industries gradually achieve digital transformation and assist them in innovating their systems and management, among other aspects.

Relevant enterprises should first analyze their current business processes, technical architecture, data assets, and organizational capabilities to identify pain points in digital transformation. Then, combining industry trends and Tencent's technological capabilities (such as AI, cloud computing, and big data), they should set short-term (1-2 years) and long-term (3-5 years) goals. Finally, these goals should be broken down into actionable phased tasks, clarifying technology investments, resource allocation, and timelines. Enterprises should also combine their actual situations and leverage relevant technological aspects to facilitate their own digital transformation.

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