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DIGITAL TRANSFORMATION AT BYD COMPANY LIMITED

Digital transformation has become a key factor in how competitive businesses are in today's business world. Companies in all kinds of fields are under more and more pressure to use information technology to improve their operations, make strategic decisions, and create long-term value. The automotive industry, especially companies that make electric cars, has a lot of trouble combining digital technologies with traditional manufacturing methods. To make sure that IT investments really do improve efficiency, they need to be checked systematically and performance needs to be monitored all the time.

Research on digital transformation and business efficiency covers a lot of different theoretical areas, but there aren't many good ways to measure how IT has improved performance. Current research insufficiently examines the amalgamation of advanced analytics, artificial intelligence, and industrial internet platforms inside manufacturing environments. Verifying efficiency improvements from IT investments poses methodological hurdles that necessitate new strategies. Chinese and international researchers, such as B. Li, F. Li, L. Lin, and Y. H. Li, have written about the issues that come up during digital transformation and how to quantify efficiency. Despite an expanding body of work, the comprehensive assessment of IT-driven efficiency enhancements in intricate manufacturing organizations is still inadequately explored, especially in swiftly advancing sectors like electric automobiles.

The purpose of the article is to investigate theoretical and practical approaches to IT-driven enterprise efficiency improvement and to identify specific mechanisms for implementing digital transformation and verification systems at BYD Company Limited.

The conceptual understanding of IT impact on enterprise efficiency has evolved significantly with technological advancement and market dynamics. Contemporary frameworks integrate multiple perspectives on digital transformation [3]:

1. Digital capabilities fundamentally reshape business models through systematic integration of technology across value chains. Organizations must orchestrate technological resources to create sustainable competitive advantages.
2. Data-driven decision-making transforms operational processes: enterprises leverage analytics for predictive insights while maintaining agility in response to market changes.
3. Technology investments require careful evaluation from perspectives of financial returns, operational improvements, and strategic positioning in digital ecosystems.
4. Efficiency gains distributed across organizational functions ultimately manifest in enhanced market performance and stakeholder value creation.
5. Digital transformation extends beyond technological adoption to encompass cultural change, organizational learning, and ecosystem participation.

Contemporary scholarship reveals diverse interpretations of digital transformation's role in efficiency enhancement. H. T. Ma et al. state digital economy emerges as primary driver of innovation and growth through platform effects, network externalities, and data-enabled business model innovations [11]. F. Li adds that digital transformation of business models requires holistic frameworks integrating technological innovation with organizational capabilities to create new value propositions and revenue streams [3]. For example, such powerful tool as big data analytics drives traditional industry transformation through value chain reconfiguration, enabling predictive capabilities and real-time optimization across operations [6].

Analysis shows that IT-driven efficiency includes technological, organizational, and strategic aspects. This complex character demonstrates that digital transformation represents fundamental organizational change rather than isolated technological adoption. The success of implementation depends on things like the industry, the organization's strengths, and the way the ecosystem works. So, IT-driven enterprise efficiency should be seen of as a planned way to improve the performance of an organization by using digital technologies, data analytics, and intelligent systems in a way that creates long-term value. Organizations that go through a full digital transformation usually get benefits including better operations, faster innovation, better customer experiences, the ability to coordinate their ecosystems, and a strong competitive position.

BYD Company Limited is a good example of a manufacturing company that has successfully gone through a full digital transformation. BYD started as making batteries in 1995. By 2023, it had become the world's largest electric vehicle maker, selling over 3 million new energy vehicles. This change shows how methodical IT integration may lead to huge gains in efficiency and a dominant position in the market.

Recent research shows that BYD's digital transformation had six main benefits: it made operations more efficient, improved products and services, made the company more competitive, encouraged coordinated industry growth, allowed for mutual help and connection within the industry, and made it easier for the industry to grow in a way that is good for the environment [24]. The company's automated production facilities show these benefits in clear

numbers. The digitalization of BYD's manufacturing shows considerable benefits in efficiency. By 2024, the welding shop at the Shenshan Factory was more than 90% automated and could make more than 400,000 pieces a year. This is a big step up from 2022, when automation was at 87% and the capacity was 300,000 units. The plant makes one white-body assembly every 58 seconds, which shows how computerized systems have made production faster than ever before.

The company's digital customer engagement platforms combine online and offline services so that customers can make appointments, ask questions, and customize their vehicles. There are several ways for customers to give feedback, including as hotlines, online customer care, and social media. This helps the company keep getting better based on what customers say. Digital technology make customizable manufacturing possible by letting clients choose the exact configurations, colors, and interiors they want. This changes traditional mass production into mass customisation.

Digitalization of research and development is another important area. BYD spends more than 10% of its revenue on research and development, mostly on battery technology, self-driving cars, and smart manufacturing. Digital simulation and testing made the innovative Blade Battery technology possible, setting new benchmarks for safety and performance. Digital twins and advanced modeling make it possible to quickly prototype and improve designs, which shortens development cycles and raises the quality of new ideas. BYD has distinct benefits since it uses vertical integration to digitalize its supply chain. BYD, on the other hand, controls the whole value chain, from making semiconductors to putting the car together. Digital systems keep this complicated ecosystem in sync, allowing for real-time optimization across thousands of suppliers and factories. Blockchain technology makes sure that the supply chain is open and easy to follow, which is necessary for sustainable sourcing and following the rules.

BYD's most ambitious digital project is the industrial internet platform. BYD makes all-in-one platforms that include design, manufacturing, logistics, and service, just like Haier's COSMOPlat. These platforms let people work together in ecosystems by linking suppliers, partners, and customers in networks for creating value. Real-time data analytics improve scheduling of production, management of inventories, and forecasting of demand throughout the whole ecosystem.

The success of digital transformation can be measured by how well the company does financially. In 2023, BYD made roughly ¥600 billion (about \$85 billion), with 78% of that coming from car sales and 22% from energy solutions. The operating profit margin went up from 5.0% in 2020 to 6.3% in 2022, showing that the company was able to run more efficiently. The company has a lot of cash on hand, and its operating cash flow has grown by 35.2% year over year. This shows that the company is in good shape even if it is spending a lot of money on expansion.

Digital tools are used in global expansion plans to help them enter new markets. BYD works in more than 70 countries, and its digital platforms are tailored to meet the needs of each region. European businesses use modern analytics to figure out where to position themselves in the market and go into the premium segment by developing products based on data. The company's global manufacturing network, which is managed by digital systems, allows for local production while keeping costs low and quality high.

BYD's strategy is different since it uses digital systems to integrate sustainability. Energy management systems let buildings use renewable energy more efficiently. Some facilities even become carbon neutral by using solar power and smart grid management. Digital monitoring keeps track of how products affect the environment from the time they are made until they are recycled at the end of their life. These skills make BYD a pioneer in sustainable manufacturing, which is important for staying competitive in the long run.

IT-driven enterprise efficiency signifies a profound transformation of organizational capacities via methodical digital integration. The BYD instance shows that successful implementation needs to take into account all three areas at the same time: technology, organization, and strategy. Digital transformation is more than just using new technologies; it also includes coming up with new business models, coordinating ecosystems, and creating long-term value. The most important results are: Integrated digital systems, not separate technologies, lead to efficiency gains. Data analytics and artificial intelligence make it possible to predict outcomes, which improves operational excellence. Platform strategies create network effects that increase value creation. Finally, integrating sustainability into digital systems is necessary for long-term competitiveness. Future research ought to investigate the transferability of digital transformation frameworks across diverse industrial contexts and cultural settings. As technology evolves more quickly and market conditions change more quickly, it becomes more important for businesses to understand how IT can help them be more efficient in the digital economy.

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