RESEARCH ARTICLE

Research on the Path and Strategy of Intelligent Transformation of Enterprises in the Era of Digital Economy

Fu Jingjing

[1] School of Education, City University of Macau, Macao, 999078, China
[2] Chuzhou Minsun Intelligent Technology Co., LTD., Chuzhou, Anhui, 239000, China

Abstract: The emergence of the digital economy has reshaped the market competitive environment for enterprises, and has given a strong impetus to the transformation and upgrading of enterprises in the direction of intelligence. With the deep integration of information technology and business, enterprises are reshaping their value chains and innovation modes to achieve the transformation from 'traditional' to 'intelligent'. Taking the definition of digital economy and the background of enterprise intelligence as the starting point, this paper analyses in depth the motivation, path choice and main challenges of enterprise intelligent transformation. With the success of Haier Group in increasing productivity from 15 per cent in 2018 to 35 per cent in 2022 within five years as well as the decline in the bad debt rate of Ping An's financial business in China, from 3.5 per cent in 2018 to 2.0 per cent in 2022. Strategic recommendations are made based on the practice, aiming to provide theoretical guidance and practical reference for the intelligent transformation of enterprises in the context of the digital economy era.

Keywords: Digital economy; enterprise intelligentisation; transformation path; strategy

1 Introduction

In the context of the rapid development of the digital economy, intelligent transformation has become an important means for enterprises to enhance their competitiveness. Enterprises can achieve the improvement of production efficiency, the optimisation of customer service and the innovation of business models through the application of intelligent technology. Intelligent not only promotes the transformation of enterprises from the traditional management mode to digitalisation and intelligence, but also drives the deep-seated change of the economic form. Digital economy is not only a product of industrial upgrading, but also an emerging economic model driven by market demand, technological progress and government support. Starting from the background of digital economy, this study analyses the connotation, driving force and path of intelligent transformation of enterprises, and puts forward relevant strategies to make full use of digital technology to enhance their core competitiveness in order to help enterprises overcome the difficulties in the transformation process and achieve efficient and intelligent development.

The concept of the digital economy was first introduced by Don Tapscott in 1997. In his book Digital Economy: Promises and Challenges in the Age of Networked Intelligence, he points out that the digital economy is an economic form based on digital technology and driven by information and knowledge at its core. In the past few decades, with the rapid development of new-generation information technologies such as 5G, artificial intelligence, and the Internet of Things, the scale of the global digital economy has grown exponentially, gradually becoming a new engine to drive global economic development. The digital economy not only brings technological progress, but also penetrates deeper into all areas of production, life and services in society, with far-reaching impacts on traditional industries and business models. Through digital and intelligent means, enterprises can be more agile in responding to market demand, creating new products and services, and meeting the personalised and diversified needs of consumers.

The development of the digital economy has also driven governments and enterprises to pay attention to emerging

technologies, promoting the construction and application of various types of innovative infrastructure. These technologies have led to the optimisation and upgrading of the economic structure in the process of continuous empowerment, enabling all industries to accelerate their transformation in the wave of the digital economy, thus enhancing the efficiency and vitality of the overall economy. In digital transformation, information data is regarded as a new factor of production, and the collection, analysis and application of data have become a key factor for enterprises to gain competitive advantages.

Enterprise Intelligence refers to the in-depth optimisation of an enterprise's business processes and operating modes through the introduction of intelligent technologies (e.g. Artificial Intelligence, Big Data, Cloud Computing, Internet of Things, etc.) to achieve the goals of automation, data-driven and intelligent decision-making. The core of intelligent transformation of enterprises lies in the use of data and technology to provide effective support for business decision-making, thereby achieving higher precision, flexibility and efficiency. For example, by analysing customer behaviour and market trends through machine learning algorithms, enterprises can predict market demand in advance and then develop more targeted marketing strategies(Tapscott, D., 1997). This intelligent transformation not only enhances the competitiveness of enterprises, but also brings significant cost savings and revenue enhancement by optimising the allocation and use of resources.

At the same time, enterprise intelligence is not limited to the optimisation of internal processes, but involves a full range of changes in production, management, marketing, service and so on. Intelligent technology provides enterprises with higher automation capabilities, making workflows more efficient and flexible; data-driven operation models help enterprises capture subtle changes in market and customer demand, and make real-time adjustments and optimisations(Rifkin, J., 2014). Intelligent decision-making systems transform complex data analyses into simplified operational recommendations, thus providing enterprises with a more multi-dimensional and refined basis for decision-making. This transformation not only improves productivity, but also provides a foundation for future innovation and expansion, giving companies a stronger competitive edge in the digital economy.

Driven by the digital economy, the intelligent transformation of enterprises often goes through the following key steps:

1.Data infrastructure construction: digitalisation is the foundation of intelligence, and enterprises need to first build a sound data infrastructure to achieve comprehensive data collection, storage, management and sharing. By building a unified data platform, enterprises can integrate data from different departments and links to form a comprehensive data view, laying the foundation for subsequent intelligent decision-making (McAfee, A., & Brynjolfsson, E., 2017).

2.Technology Enablement: Introduce artificial intelligence, big data analysis, Internet of Things and other technical means to upgrade the existing processes and business models of enterprises. For example, using AI models to predict market trends and monitoring the status of production equipment through IoT devices to achieve predictive maintenance to improve production efficiency (Schwab, K., 2016).

3.Organisational change and process optimisation: Intelligent transformation of enterprises is not only the application of technology, but also involves the adjustment of organisational structure and the optimisation of business processes. Through a data-driven management model, enterprises can streamline processes, improve operational efficiency, enhance organisational flexibility, and promote information sharing and cross-sector collaboration.

4.Intelligent decision-making: The ultimate goal of intelligent transformation is to achieve accurate and efficient decision-making to help enterprises respond quickly in the complex and changing market environment. The introduction of an intelligent decision-making system can

provide decision-makers with a scientific basis based on real-time data and predictive analyses to help them make the best choices, thus enhancing the market competitiveness of enterprises (Brynjolfsson, E., & McAfee, A., 2014).

5.Continuous Innovation and Optimisation: Intelligent transformation is a dynamic process, and enterprises need to continuously innovate and optimise their intelligent applications through real-time monitoring and feedback mechanisms to adapt to changes in the market and technology, so as to achieve sustained competitive advantages.

Driven by the digital economy, the process of intelligent transformation of enterprises will continue to accelerate, which not only changes the operation mode of enterprises, but also profoundly affects the entire industrial ecosystem.

2 The driving force of the intelligent transformation of enterprises

2.1 Intensity of market competition

With the deep penetration of digital technology and the increasing blurring of industrial boundaries, the entry barriers of traditional industries have been significantly lowered, and market competition has become more intense. Enterprises not only face competition from their peers, but also need to deal with the impact and substitution of cross-industry innovative enterprises and emerging platforms. In order to maintain market position and competitive advantage, intelligent transformation has become an inevitable strategic choice for enterprises.

Driven by the technological revolution, enterprises are paying more and more attention to the construction of digital and intelligent capabilities. Intelligent transformation not only helps enterprises achieve operational efficiency, but also accelerates the optimisation of internal processes and the rational allocation of resources through advanced technological means, thus enhancing the ability to adapt to rapid changes in the market. For example, artificial intelligence and big data analysis can assist enterprises in accurately predicting market trends and optimising the supply chain, so as to effectively respond to competitive pressures from different sectors.

With the convergence of industries brought about by technological advances, the competitors of enterprises are no longer limited to traditional enterprises in the same industry, and cross-industry competition has become a common phenomenon. E-commerce platforms, logistics companies, technology companies and even social media platforms have crossed the border into various industries through intelligent technology. For example, the retail industry not only has to compete with traditional supermarkets, but also has to deal with the double impact of e-commerce platforms and logistics technology companies. These emerging platforms optimise the user experience with the help of intelligent algorithms, precise recommendations and other means, often accumulating a large number of customers in a short period of time and squeezing the market share of traditional enterprises.

Intelligent transformation enables enterprises to have obvious advantages in cost control, operational efficiency and customer service. Intelligent process management can help enterprises realise production automation, real-time supply chain monitoring and customer demand forecasting, thus saving costs and improving service response speed. Especially in supply chain management, intelligent technology can achieve accurate allocation of resources and real-time adjustment of processes through data collection and analysis, avoiding problems such as resource waste and overcapacity.

In addition, intelligence also brings profound changes to customer service. Through digital platforms and intelligent customer service systems, companies can provide 24-hour online support and personalised services based on customer data. This not only improves customer satisfaction, but also enhances customer loyalty, thus building lasting customer relationships in a competitive market.

2.2 Changes in customer demand

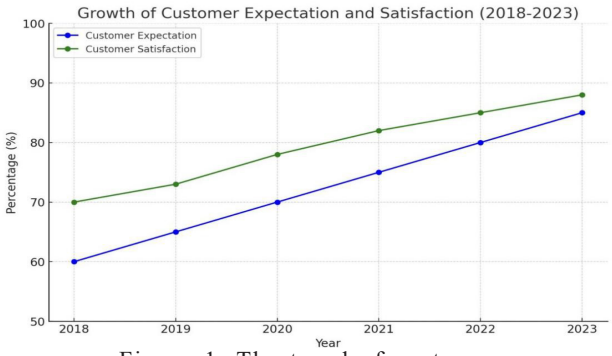


Figure 1. The trend of customer

The above line chart shows the increasing trend of customer expectations and satisfaction from 2018 to 2023. It can be seen that the proportion of customers' demand for personalized services has increased from 60% to 85%, and in the intelligent service experience, customer satisfaction has increased from 70% to 88%. This trend reflects the importance of intelligent transformation in meeting customer needs.

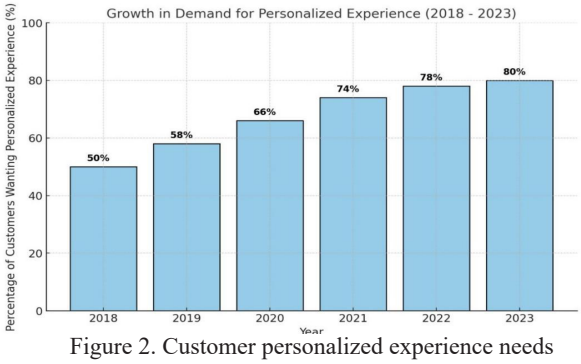


Figure 2. Customer personalized experience needs

This is a bar chart showing the increasing trend of customers' demand for personalized experiences year by year. From 50% in 2018 to 80% in 2023, it shows that the demand for personalized recommendations from enterprises is increasing year by year, with an average growth rate of 10% -15%.

In the digital era, consumers' demand for personalisation, efficiency and convenience has become stronger and stronger, and their expectations for products and services are rising. The diversification and individualisation of customer demands make it difficult to adapt to the traditional supply model (Chen, L., & Zhang, J., 2020). Intelligent transformation can help enterprises achieve in-depth insights into customer needs and rapid response to create more attractive products and service experiences. For example, by analysing users‘ viewing habits and preferences, streaming media service providers can accurately recommend content that meets users’ interests, and even customise personalised content, thus enhancing users' stickiness and satisfaction (Brynjolfsson, E., & McAfee, A., 2014).

2.3 Driven by technological development

The booming development of emerging technologies such as Artificial Intelligence (AI), Internet of Things (IoT), Big Data and Cloud Computing has provided strong technical support for the intelligent transformation of enterprises. These technologies have empowered the entire process of enterprise production and operation, promoting the realisation of automation and data-driven refined decision-making and management, and enhancing the operational efficiency and market responsiveness of enterprises. For example, by analysing customer behaviour through AI algorithms, enterprises are able to more accurately predict changes in demand, optimise supply chain management and reduce inventory backlogs; and the application of IoT technology enables real-time data interconnection between devices, thus achieving predictive maintenance and effectively reducing operating costs.

In the future, with the further popularisation and deepening of these intelligent technologies, enterprises will have more opportunities to explore innovations in areas such as smart production, smart logistics and personalised services. With the help of intelligent technology, enterprises can not only improve internal management efficiency, but also respond faster to market trends, promote business model innovation, build a customer-centric service system, and provide customers with more personalised and accurate products and service experience. This digital and intelligent transformation path will help enterprises maintain their competitiveness in the wave of the digital economy and lay a solid foundation for long-term sustainable growth in the future.

2.4 Driven by policies and social environment

With the global focus on sustainable development,

carbon neutrality, and smart cities, the government and society are gradually raising their requirements on enterprises, and more and more policies and regulations encourage or mandate enterprises to take the initiative to carry out green and intelligent transformation. In this context, intelligence is not only a means to cope with market pressure, but also an important way to meet policy requirements and fulfil social responsibility. For example, through smart grids and smart energy management systems, companies can monitor and optimise energy consumption in real time, reduce their carbon footprint and help achieve environmental protection and sustainable development goals.

With the global focus on sustainable development, carbon neutrality and the construction of smart cities, the intelligent transformation of enterprises has become an inevitable trend of the times. The government and society are gradually increasing their requirements for enterprises to become green and intelligent, and relevant policies and regulations not only encourage, but in some cases even mandate, enterprises to accelerate their pace and realise the transformation through innovation and technological means. In this context, intelligent transformation is not only an effective means for enterprises to cope with the pressure of market competition, but also a key way to satisfy the policy orientation and actively fulfil social responsibility.

Governments have introduced policies and regulations aimed at promoting enterprises to actively reduce carbon emissions and improve resource utilisation efficiency. The application of intelligent technology has become an important tool for realising these policy requirements. For example, many countries are implementing carbon tax, carbon trading and green tax incentives, aiming to incentivise enterprises to adopt green production and smart management technologies to achieve energy saving and emission reduction. Intelligent transformation is thus given a deeper meaning than just technological upgrading, but also as a direct response to corporate social and environmental responsibility.

Smart grids and smart energy management systems are one of the typical applications for companies to reduce their carbon footprint and green their operations. Through these smart technologies, enterprises can monitor the production, distribution and consumption of energy in real time and use data analysis to optimise energy use and avoid unnecessary waste. This not only directly reduces operating costs, but also helps companies build a good social image in terms of resource use and environmental protection.

In addition, intelligent technologies also hold great promise in improving supply chain efficiency, reducing pollution emissions and realising a circular economy. For example, smart logistics systems use IoT and AI to optimise routes and load configurations, thereby reducing fuel consumption and emissions. Smart manufacturing technologies reduce equipment downtime and improve the energy efficiency ratio of production lines through real-time monitoring and predictive maintenance. Meanwhile, IoT devices are used to track resources and waste in the production process in real time, bringing companies closer to their zero-emission goals.

Intelligent transformation provides companies with unprecedented competitive advantages. While improving productivity, smart technologies can also help companies achieve transparency and data-driven decision-making in supply chain, energy management and customer service, resulting in a more stable and efficient management model. In the future, with the further spread of 5G, IoT and big data technologies, smart technologies will be more deeply embedded in the daily operations of enterprises, enabling them to respond quickly to changes in the market and environment and flexibly adjust their strategies to meet new development requirements.

2.5 Demand for Enhanced Innovation Capabilities

Another driving force for smart transformation is the constant pursuit of innovation capability and market resilience by enterprises. In a rapidly changing market environment, enterprises need to quickly experiment with

new business models, optimise product iteration processes, and effectively respond to dynamic changes in the market through intelligent means. Intelligent R&D tools and automation technologies can shorten the product cycle from concept to landing and increase the speed of innovation for enterprises. For example, by using AI technology to simulate product performance and optimise the design process, the R&D department not only improves R&D efficiency, but also accelerates the innovation cycle, providing companies with faster market responsiveness.

To sum up, intelligent transformation has become the core driving force for enterprises to maintain competitive advantages, enhance customer satisfaction and achieve sustainable development. In the future, enterprises will more deeply apply technology to all aspects of their business, driving the entire industry towards a new era of greater intelligence, innovation and efficiency.

3 Path Analysis of Enterprise Intelligent Transformation

3.1 Technology-driven path

Technology-driven is one of the core paths for enterprises to achieve intelligent transformation. By introducing advanced intelligent technologies, enterprises can significantly improve production efficiency, resource utilisation and market responsiveness. For example, the introduction of Internet of Things (IoT), big data analysis, artificial intelligence and other Industry 4.0 technologies in the manufacturing industry has enabled production equipment to achieve automation and intelligent precision control. This transformation not only effectively improves the efficiency of production lines and reduces labour costs, but also predicts potential failures and conducts maintenance in advance through real-time monitoring of equipment operating conditions and data analysis, significantly reducing downtime and thus improving production continuity and product quality.

The retail industry is also technology-driven in automated warehousing and logistics systems, using robots and intelligent algorithms to manage inventory, orders, and distribution. Robots can adjust inventory locations on demand, perform automated picking and packing, and improve stock-out efficiency and distribution accuracy, greatly enhancing supply chain flexibility and responsiveness. This accurate inventory management and fast delivery not only reduces inventory backlogs and logistics costs, but also brings consumers a more convenient shopping experience and helps companies maintain a competitive advantage in the market.

3.2 Data-driven path

Data-driven is an important path for the intelligent transformation of enterprises, which provides a scientific basis and data support for intelligent decision-making through the collection, analysis and application of big data. Through in-depth mining of internal and external data, enterprises are able to gain insight into market trends and predict consumer demand, thereby optimising business decisions. For example, e-commerce platforms use data analysis to accurately profile user behaviours and preferences, so as to provide personalised recommendations, customised marketing campaigns, and improve user experience and conversion rates.

In terms of intelligent decision-making, data-driven can not only help companies respond to market changes with greater agility, but also provide quantifiable risk prediction and strategic guidance in complex business environments. For example, the financial industry uses big data and machine learning technologies for credit assessment and risk control to help enterprises identify potential default risks and optimise asset allocation; meanwhile, in retail, manufacturing and other industries, through the analysis and prediction of sales data, enterprises are able to optimise their inventory strategy and reduce the risk of inventory backlog or shortage. Through data-driven intelligent transformation, enterprises are able to achieve more efficient and accurate business management, thus standing out in the fierce market competition and enhancing market insights and overall

competitiveness.

3.3 Business Model Innovation Path

Intelligent transformation is not only reflected in technology and data application, but also in business model innovation. Enterprises can better adapt to changes in the market environment and customer demand by innovating their business models. For example, in the face of the rise of e-commerce and the trend of on-line and off-line integration, traditional retail enterprises have gradually shifted to the 'new retail' model, which provides customers with more convenient and personalised services through the construction of an integrated on-line and off-line consumer experience (Vial, G., 2019). This business model innovation not only enhances customer stickiness, but also expands new market space. In addition, the medical industry has achieved the sharing and optimisation of medical resources through telemedicine, intelligent diagnosis and other technologies, improving the overall service level and patient experience.

3.4 Organisational and cultural change path

Organisational and cultural change is also one of the key paths to intelligent transformation. In the process of intelligent transformation, enterprises need to reshape their organisational structure and cultivate an innovative and data-driven corporate culture in order to better adapt to the new business environment. Intelligent transformation often leads to process re-engineering and cross-departmental collaboration, prompting companies to shift from 'departmentalisation' to 'platformisation' or 'flattening' (Berman, S. J., 2012). By creating flexible organisational structures and facilitating cross-departmental data sharing, companies can coordinate resources more efficiently and achieve rapid market response. At the same time, the company's management culture needs to shift to be data-driven, innovation-oriented and customer-centric to ensure that the transformation is sustained and that employees buy into it (Wang, H., & Zhang, J., 2021).

3.5 Eco-Cooperation Path

In the process of intelligent transformation, it is often difficult for a single enterprise's capabilities and resources to fully meet the increasingly complex market demands. Therefore, many enterprises choose to establish cooperation and collaborative innovation with upstream and downstream partners, technology companies and startups by building an open ecosystem. Such eco-collaboration not only accelerates the pace of technological innovation, but also integrates resources from multiple parties and shares market opportunities. For example, automobile manufacturers cooperate with technology companies to develop Telematics and autonomous driving technologies, and achieve comprehensive intelligent upgrading of products and services through the linkage of the industrial ecosystem.

In summary, the path of intelligent transformation of enterprises is multi-dimensional, involving not only the application of technology and data, but also covering the reshaping of business models, changes in organisational structure and synergy of the ecosystem. These paths work together in mutual promotion, enabling enterprises to have stronger innovation capability, market adaptability and sustainable development potential in future competition.

4 Challenges of Intelligent Transformation of Enterprises

4.1 Difficulty in technology implementation

Intelligent transformation requires enterprises to integrate a variety of technologies, including artificial intelligence, big data analytics, IoT and cloud computing, etc., and the implementation of these technologies involves highly complex architectural design and fine-tuned coordination of multiple links. From technology selection, system design to architecture construction, each step of the process puts high demands on an enterprise's technical strength and project management capabilities. For many enterprises, especially traditional ones, the existing system architecture and infrastructure may be difficult to support new smart technologies. Their existing systems often lack compatibility and resilience to meet the demands of large-

scale data processing, real-time analysis and automated control in intelligent transformation.

In addition, the demand for technical talents in intelligent transformation is extremely urgent, but many enterprises are relatively weak in terms of technical reserves and talent, especially in the field of cross-disciplinary smart technologies, and lack sufficient experience and expertise reserves. To overcome these barriers, companies need to develop a team with smart technology expertise during the transformation process, and may also need to invest significant resources in technical training, system upgrades and maintenance. This high technology and resource requirement makes the complexity and cost of technology implementation one of the key barriers to smart transformation (Zheng, L., & Yu, X. ,2019).

4.2 Data security and privacy issues

Intelligent transformation relies on extensive collection, storage and analysis of data, but this simultaneously poses serious challenges to data security and privacy protection. With the implementation of the EU General Data Protection Regulation (GDPR) and other data protection regulations, companies are subject to increasingly stringent compliance requirements for data processing and management, especially in the management of user data and sensitive business information, which must comply with strict legal norms and ethical guidelines.

Once user information or business data involved in intelligent transformation is leaked, it will not only bring huge economic losses and legal risks to enterprises, but also cause irreparable damage to brand image and customer trust. Enterprises need to adopt strong data governance measures, such as data encryption, access control, authentication and log review, to safeguard the security of data during transmission, storage and analysis. At the same time, they establish sound data management policies and processes to ensure that the collection, processing and use of data comply with relevant laws and regulations, and maximise the protection of user privacy from infringement. Such strict data protection measures are not only a response to the requirements of policies and regulations, but also the key for enterprises to win customers' trust and establish a sense of brand responsibility in intelligent transformation (European Union, 2016).

4.3 Resistance to organisational change

Intelligent transformation is not only a change at the technical level, but also involves the reshaping of organisational structure and corporate culture. The introduction of new intelligent technologies and processes by enterprises often brings a series of management and workflow adjustments, and even requires enterprises to carry out certain reorganisation in the organisational structure (Zhang, R., 2021). Some employees may be resistant to the new technology, and may feel uncomfortable with the changes in work content and skill requirements brought about by the transformation, which will often affect the promotion of the transformation. For this reason, enterprises need to establish a cultural atmosphere adapted to the transformation, enhance the technical skills of employees through systematic training programmes, set up incentive mechanisms to encourage employees to accept new technologies and actively participate in the transformation process, so as to alleviate the resistance brought about by organisational change.

4.4 Uncertainty of transformation costs and returns

Intelligent transformation often requires significant investment in capital and resources, including technology research and development, equipment upgrades, and personnel training. However, the benefits of the transformation process may be uncertain. The application effect and market feedback of some smart technologies may take a long time to show up, while the high upfront costs may increase the financial pressure on the enterprise. In addition, the rapid pace of technological change leads to the need for enterprises to plan carefully when selecting technologies to avoid the risk of technological obsolescence

soon after the transition (Wang, W.,2022). To address this challenge, enterprises need to conduct comprehensive risk assessments and cost-benefit analyses before the transition, develop a viable return on investment strategy, and set milestones to measure the effectiveness of the transition.

4.5 Complexity of ecosystem and partner synergy

In intelligent transformation, enterprises often need to rely on the support of their supply chain, technology providers and external partners to establish a complete intelligent ecosystem. However, differences in technical standards, data sharing, and market strategies among the parties may lead to synergy difficulties and even affect the effectiveness of transformation (Wang, Y. Q.,2019). Especially in scenarios requiring multi-party collaboration, such as smart manufacturing and smart logistics, the interests and collaboration methods between ecological partners need to be fully coordinated in order to achieve resource complementarity, technology sharing, and enhance overall effectiveness. To this end, enterprises need to strengthen the communication mechanism with partners, establish a transparent and efficient cooperation model, and achieve multi-win through collaborative innovation (Chen, L. ,2020).

Overall, intelligent transformation is both a necessary path for enterprises to move into the future and a challenging and complex process. In the face of multiple challenges such as technology, data security and organisational culture, enterprises need to formulate a global transformation strategy, flexibly adjust resource allocation, and establish a human-centric and data-driven management mechanism to achieve effective integration of technology upgrading and business innovation, so as to be invincible in the competition (Li, X., & Zhang, Q., 2019).

5 Strategy Suggestions for Intelligent Transformation of Enterprises

5.1 Strengthen investment in technology research and development

In the competitive environment of intelligent transformation, enterprises need to take core technology research and development as a strategic priority, especially in the fields of artificial intelligence, big data, Internet of Things and automation to increase investment. The construction of the internal technical team should take the cultivation of talents and the introduction of external professional resources as the core strategy, bringing together internal and external advantages to form a synergy of technological innovation. By establishing in-depth co-operation with technology-leading enterprises and research institutes, enterprises can accelerate the application of technology on the ground, shorten the R&D cycle, and ensure that they stay ahead of the curve in terms of technology (Chen, L. ,2020).

In order to ensure that the key technology research and development with industry adaptability, enterprises should also actively participate in the formulation of industry standards and technical specifications, which can not only enhance the enterprise's market power, but also promote the development of the entire industry in the direction of standardisation. In addition, enterprises can also consolidate the achievements of technological innovation through intellectual property layout, patent application and other ways to form technical barriers, laying a solid foundation for future market competition (Li, X., & Zhang, Q., 2019).

5.2 Formulate Data Governance and Security Strategies

Data has become a strategic resource for driving business innovation and decision-making optimisation. To ensure the smooth implementation of intelligent processes, enterprises must establish a comprehensive data governance system to ensure that data is effectively managed in all aspects of collection, storage, processing, transmission and application. Such a comprehensive data governance strategy should be equipped with stringent data security standards and compliance frameworks, which not only can effectively prevent potential security risks and safeguard user privacy, but also enhance the trust and brand credibility of the

enterprise (Alhassan, I., 2016).

In addition, a data governance strategy needs to take into account the need for collaboration within the enterprise and promote cross-departmental data sharing and circulation, so as to provide more in-depth data support for intelligent transformation. Enterprises can break down information silos by building a data lake or data centre to ensure that departments collaborate on analysis and decision-making based on the same data. The management of data sharing should adopt flexible permission configuration and privacy protection mechanisms to ensure data security while maximising data value (Davenport, T. H.,2018).

5.3 Promote Organisational Change and Cultivate an Intelligent Culture

Intelligent transformation is not an upgrade of a single technology or process, but requires in-depth changes in organisational structure, work style and corporate culture. Enterprises should actively promote flat management and cross-departmental collaboration to form an agile and efficient work system. By strengthening employee training and setting up transformation incentives, enterprises can effectively improve employee recognition and participation in intelligentisation (Lemon, K. N., & Verhoef, P. C., 2016). In addition, intelligent transformation needs to cultivate employees' data literacy and technology application capabilities, so that they can make a smooth transition in the face of the new work model and truly establish a data-driven, innovation-oriented corporate culture.

5.4 Optimise user experience by focusing on customers

In intelligent transformation, customer demand is the core driving force for enterprise development. Enterprises need to gain a deep insight into customer needs through the application of intelligent technology and provide a personalised and efficient user experience. For example, through real-time data analysis, enterprises can dynamically track customer behaviour and make accurate predictions, so as to respond quickly in product design, marketing strategy and customer service (Brynjolfsson, E., & McAfee, A., 2017). In addition, enterprises should also establish a feedback mechanism to further optimise products and services by analysing customer feedback and usage data, so as to continuously improve user satisfaction and loyalty (Chen, H.,2012).

5.5 Build an Intelligent Ecosystem and Promote Collaborative Innovation

Intelligent transformation not only relies on the internal innovation ability of enterprises, but also requires extensive industrial collaboration. Enterprises can build an open intelligent ecosystem and work together with upstream and downstream supply chains, technology companies, industry associations, and startups to form a mutually beneficial and win-win innovation network. This eco-cooperation model can integrate resources from multiple parties, increase the overall speed of technological innovation, and accelerate the marketisation of products. For example, manufacturing enterprises can cooperate with IoT companies to develop smart manufacturing solutions, realise information linkage between equipment, and promote intelligent upgrading of the entire production process.

5.6 Formulate a long-term strategy to promote continuous innovation

Intelligent transformation is not an overnight process, enterprises need to develop a clear long-term strategy and build the internal drive for continuous innovation. By building a rapid feedback and iteration mechanism, enterprises can flexibly respond to changes in market demand and technological development, and continuously optimise business processes. At the same time, enterprises also need to maintain their attention and investment in cutting-edge technologies, and ensure their continued competitiveness in the field of intelligence through regular evaluation and strategy updates. In the future, as intelligent technology continues to evolve, the intelligent transformation process of enterprises will continue to deepen, expanding a broader development space for them and truly realising intelligent-

driven business value enhancement.

6 Case Study: Success and Inspiration of Intelligent Transformation

6.1 Intelligent Manufacturing in Haier Group

Year	Production Efficiency Improvement (%)	Inventory Cost Reduction (%)	Customer Satisfaction (%)
2018	15	10	85
2019	20	15	88
2020	25	20	90
2021	30	25	92
2022	35	30	95

Figure 3. Production Efficiency Improvement Data

Year	Proportion of Personalized Customized Products (%)
2018	10
2019	15
2020	25
2021	40
2022	55

Figure 4. Proportion of Personalized Customized Products

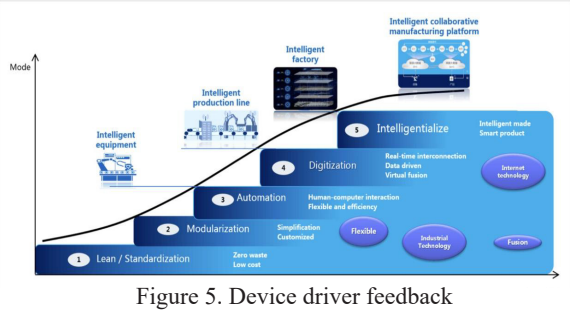


Figure 5. Device driver feedback

Haier Group is a pioneer in the field of smart manufacturing, realising the intelligence of the whole process from production to delivery through the application of Internet of Things (IoT) and big data technologies. Haier's smart factory enables personalised customisation according to user needs, optimising workflow and resource allocation through real-time monitoring of production equipment and production lines. Users can participate in product design and submit personalised demands through the customisation platform. The smart factory will dynamically adjust production based on user input to ensure that the final product accurately meets customer expectations.

This smart manufacturing model not only improves production efficiency and customer satisfaction, but also reduces inventory and operating costs. Haier's success demonstrates a user-demand orientated, technology innovation driven approach that points the way to the intelligent transformation of the manufacturing industry. This model embodies a high degree of integration between technological upgrades and market adaptability.

Haier's successful experience emphasises the importance of user demand orientation in the smart manufacturing process. In the process of transitioning to smart manufacturing, companies should not only adopt advanced IoT and big data technologies, but also establish a production model centred on user experience. This approach enables a highly flexible market response and the ability to provide personalised and customised services (Lee, J., Bagheri, B., & Kao, H. A.,2015).

Key data highlights

Increased productivity: Increase productivity from 15% in 2018 to 35% by 2022 in five years.

Reduced inventory costs: Inventory costs reduced from 10 per cent in 2018 to 30 per cent in 2022.

Customer Satisfaction: Significant increase in customer satisfaction from 85 per cent in 2018 to 95 per cent by 2022.

Personalised and customised products: A significant increase in the proportion of personalised and customised products from 10% in 2018 to 55% by 2022.

6.2 Ping An's Financial Technology

Year	Service Efficiency Improvement (%)	Default Risk Reduction (%)	Bad Debt Rate (%)
2018	20	15	3.5
2019	30	20	3.2
2020	40	25	2.8
2021	50	30	2.5
2022	60	35	2.0

Figure 6. Key Data Highlight

Ping An of China has achieved significant results in the intelligent transformation of the financial industry using artificial intelligence (AI) and big data technologies, especially in intelligent customer service and intelligent risk management.

Through its intelligent customer service system, Ping An of China has realised an automatic response to customer needs, greatly improving service efficiency. The system can handle customer enquiries faster and more accurately,

thereby increasing customer satisfaction and retention.

The Intelligent Risk Management System allows real-time monitoring and analysis of customer credit status. This feature greatly improves Ping An Bank's ability to identify and control risks, enabling it to take proactive measures to manage potential defaults. As a result, the transformation not only enhances the service experience, but also reduces the risk of default and effectively controls the bad debt rate of financial services (Brynjolfsson, E., & McAfee, A.,2017).

Ping An Bank's success shows that the financial industry should make full use of AI and big data technologies in the process of intelligent transformation. The focus should be on optimising customer service and enhancing risk management. Key considerations include how the financial industry can rely on technology to closely align with core business needs and improve service efficiency and business security through intelligent means.

According to the chart above, in terms of risk management, default risk has also been effectively controlled. Through the intelligent risk control system, the default risk has been reduced from 15 per cent in 2018 to 35 per cent in 2022. Meanwhile, the bad debt ratio of financial business has likewise seen a decrease, from 3.5 per cent in 2018 to 2.0 per cent in 2022. This shows that with the help of AI and big data technology, Ping An of China has not only optimised its customer service experience, but also made significant progress in risk management, effectively controlling the risks of its financial business. Overall, these figures fully reflect the important role of intelligent transformation in improving service efficiency and reducing risks.

Ping An Bank's success shows that the financial industry should make full use of AI and big data technologies in the process of intelligent transformation. The focus should be on optimising customer service and enhancing risk management. Key considerations include how the financial industry can rely on technology to closely align with core business needs and improve service efficiency and business security through intelligent means. Intelligent transformation is crucial not only for technological innovation, but also for building a customer-orientated business ecosystem. By adopting an intelligent approach, firms can enhance service quality, improve operational efficiency and strengthen risk prevention, thereby ensuring a competitive advantage in a fast-moving financial environment (Parasuraman, A.,1985).

7 Conclusion

Driven by the wave of the digital economy, intelligent transformation of enterprises is not only a trend that conforms to the development of the times, but also an inevitable choice to enhance core competitiveness. Intelligent transformation can help enterprises maintain innovation and adaptability in the fierce market competition, and provide strong support for product development, customer experience and internal process optimisation. Through intelligent layout, enterprises can make full use of technologies such as big data, artificial intelligence and the Internet of Things to make significant progress in insighting customer needs, improving production efficiency and realising accurate decision-making. However, this transformation process is not an easy task, and enterprises not only need to have a long-term strategic vision, but also need to have the ability to flexibly respond to market changes and technical support.

Reference

Tapscott, D. (1997). The Digital Economy: Promise and Peril in the Age of Networked Intelligence. New York: McGraw-Hill.

Rifkin, J. (2014). The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism. New York: St. Martin's Press.

McAfee, A., & Brynjolfsson, E. (2017). Machine, Platform, Crowd: Harnessing Our Digital Future. New York: W.W. Norton & Company.

Schwab, K. (2016). The Fourth Industrial Revolution. Geneva: World Economic Forum.

Brynjolfsson, E., & McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. New York: W.W. Norton & Company.

Chen, L., & Zhang, J. (2020). “Research on the Development of Digital Economy and Its Impact on Traditional Industries.” Journal of Industrial Integration and Management, 5(3), 125-137.

Brynjolfsson, E., & McAfee, A. (2014). The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. New York: W.W. Norton & Company.

Vial, G. (2019). "Understanding Digital Transformation: A Review and a Research Agenda." The Journal of Strategic Information Systems, 28(2), 118-144.

Berman, S. J. (2012). "Digital Transformation: Opportunities to Create New Business Models." Strategy & Leadership, 40(2), 16-24.

Wang, H., & Zhang, J. (2021). "The Role of Technology and Data in Enterprise Digital Transformation." Journal of Business Research, 125, 571-581.

Zheng, L., & Yu, X. (2019). "Big Data and Artificial Intelligence in the Digital Economy: Technology and Applications," Journal of Management Science, 5(3), 15-23.

European Union (2016). General Data Protection Regulation (GDPR). Official Journal of the European Union.

Zhang, R. (2021). Exploration and Practice of Intelligent Manufacturing. China Entrepreneur.

Wang, W. (2022). Pathways and Practices of Intelligent Transformation in the Financial Industry. Financial Times.

Wang, Y. Q. (2019). Research on the Path of Enterprise Intelligent Transformation in the Context of Digital Economy. Chinese Management Science, 12(1), 45-52.

Chen, L. (2020). Analysis of Key Factors in Enterprise Intelligent Transformation. Modern Management, 34(4), 55-60.

Li, X., & Zhang, Q. (2019). Challenges and Strategies of Enterprise Digital Transformation under the Digital Economy. Economic Management, 41(12), 1-8.

Chen, L. (2020). Analysis of Key Factors in Enterprise Intelligent Transformation. Modern Management, 34(4), 55-60.

Li, X., & Zhang, Q. (2019). Challenges and Strategies of Enterprise Digital Transformation under the Digital Economy. Economic Management, 41(12), 1-8.

Alhassan, I., Sammon, D., & Daly, M. (2016). Data governance activities: An analysis of the literature. Journal of Decision Systems, 25(sup1), 64-75.

Davenport, T. H., & Ronanki, R. (2018). Artificial Intelligence for the Real World. Harvard Business Review, 96(1), 108-116.

Lemon, K. N., & Verhoef, P. C. (2016). Understanding Customer Experience throughout the Customer Journey. Journal of Marketing, 80(6), 69-96.

Brynjolfsson, E., & McAfee, A. (2017). Machine, Platform, Crowd: Harnessing Our Digital Future. W.W. Norton & Company.

Chen, H., Chiang, R. H., & Storey, V. C. (2012). Business intelligence and analytics: From big data to big impact. MIS Quarterly, 36(4), 1165-1188.

Lee, J., Bagheri, B., & Kao, H. A. (2015). A cyber-physical systems architecture for industry 4.0-based manufacturing systems. Manufacturing Letters, 3, 18-23.

Brynjolfsson, E., & McAfee, A. (2017). Machine, Platform, Crowd: Harnessing Our Digital Future. W.W. Norton & Company.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. Journal of Marketing, 49(4), 41-50.