



**THE IMPACT OF DIGITAL TRANSFORMATION ON EMPLOYEE
JOB SATISFACTION - A CASE STUDY OF CHONGQING CHANGAN
AUTOMOBILE MANUFACTURING ENTERPRISE**

**LI ZONGNAN
6517195817**

**AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION
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This Independent Study has been Approved as a Partial Fulfillment of the
Requirements for the Degree of Master of Business Administration


Advisor:
(Dr.Zhang Li)

Date: 7 / 11 / 2025

.....
(Associate Professor Dr.Jomphong Mongkhonvanit)
Dean, Graduate School of Business

Date: 4 / 2 / 2025
Siam University, Bangkok, Thailand

Title: The Impact of Digital Transformation on Employee Job Satisfaction - A Case Study of Chongqing Changan Automobile Manufacturing Enterprise
By: Li Zongnan
Degree: Master of Business Administration
Major: International Business Management

Advisor: 
(Dr.Zhang Li)
7 / 11 / 2024

ABSTRACT

Amid the global wave of digitalization, enterprises enhance their competitiveness through digital transformation. This study aimed to explore the impact of digital transformation on employee job satisfaction. The research objectives were: 1) To examine the impact of digital transformation on job satisfaction; 2) To examine the differences in job satisfaction by different employee groups.

This study adopted the quantitative research methodology and Maslow's hierarchy of needs theory. A questionnaire survey was conducted with the target population of 10,000 employees of a manufacturing enterprise, Chongqing Changan Automobile Co., Ltd., and 406 employees as were randomly selected as the sample for empirical analysis.

The research results showed that digital resources, employee skills, top management, and technological innovation had a significant positive impact on employee job satisfaction, particularly in improving employee training and development and job performance. Meanwhile, educational background and job position significantly impacted work-life balance, while gender, age, and department of employment did not reach a significant level. The research concluded that companies should pay attention to the needs of employees with different educational backgrounds and job positions, and provide equal training and support to comprehensively enhance employee job satisfaction and overall performance.

Keywords: digital transformation, employee job satisfaction, digital resources, technological innovation

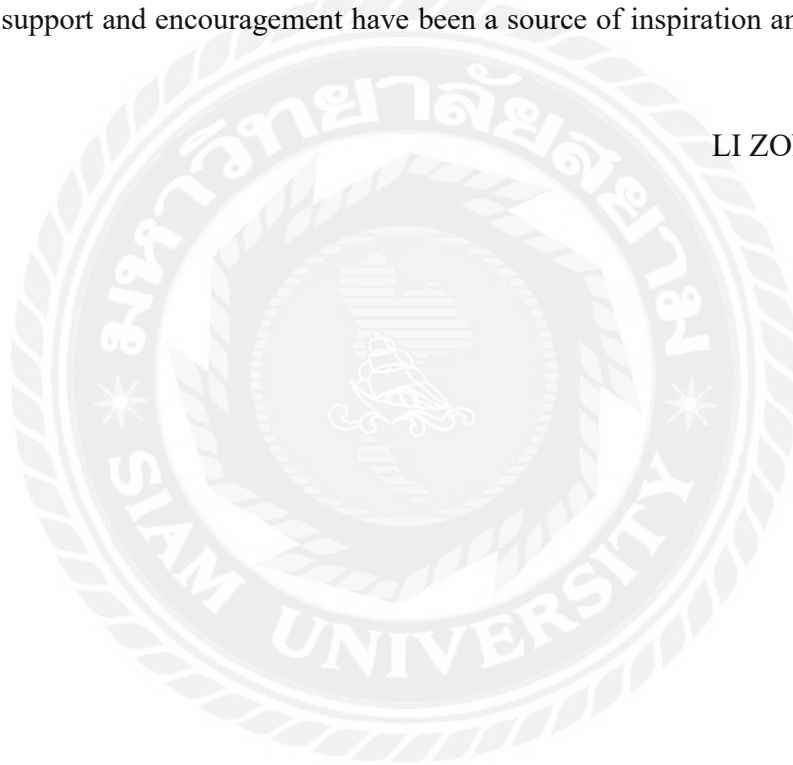
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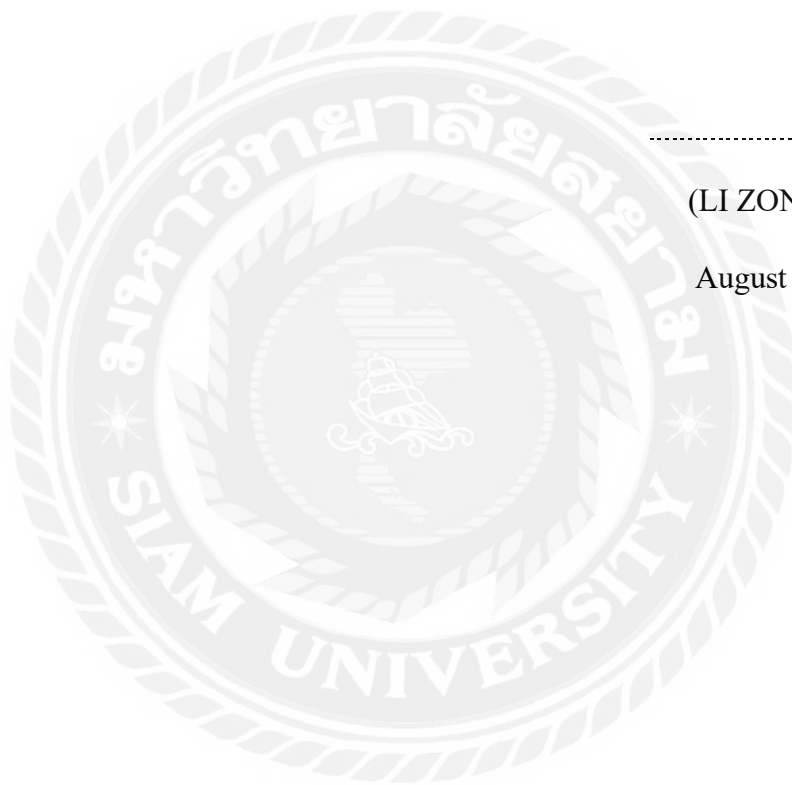
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LI ZONGNAN



DECLARATION

I, *LI ZONGNAN*, hereby declare that the research in this independent study entitled "The Impact of Digital Transformation on Employee Job Satisfaction - A Case Study of Chongqing Changan Automobile Manufacturing Enterprise" is original and has not been submitted to any other university or institution for a higher degree.



.....
(LI ZONGNAN)

August 21, 2024

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Chapter 1 Introduction

1.1 Background of the Study

1.1.1 Theoretical Background

Digital Transformation (DT) refers to the comprehensive integration of digital technologies into business processes and operational models to enhance a company's competitiveness and ability to adapt to market changes (Saariko et al., 2020; Verhoef et al., 2021). This process not only involves the application of information technology and the reorganization of business processes but also includes the creation of new business models. For instance, the application of technologies such as the Internet of Things (IoT), big data analytics, cloud computing, and artificial intelligence can significantly improve operational efficiency and flexibility, helping companies maintain a competitive edge in rapidly changing market environments (Blichfeldt & Faillant, 2021). However, the success of digital transformation in technology and business process innovation is closely linked to employees' cognition and attitudes toward these changes. Studies by DiPietro (2020) & Sun (2021) have shown that positive employee attitudes and high acceptance levels can facilitate effective technology implementation, enhancing work efficiency and innovation capacity. Conversely, employee resistance to new technologies and poor adaptation can lead to decreased job satisfaction, negatively impacting overall company performance and market competitiveness (Farivar & Richardson, 2021). Additionally, Buchwald & Urbach (2020) pointed out that neglecting employee training and adaptation processes during digital transformation often results in low acceptance of new technologies and reduced job satisfaction, ultimately leading to resistance and performance declines, thus failing to achieve the anticipated efficiency and competitiveness of digital transformation.

In contrast, companies that successfully implement digital transformation often prioritize employees' understanding and acceptance of new technologies. These companies implement comprehensive training programs, continuous technical support, and effective communication mechanisms to help employees understand and adapt to new work methods, thereby improving their job satisfaction. For example, through comprehensive digital transformation plans, including employee training and technical support, employees can smoothly transition to new work models, significantly enhancing job satisfaction and overall performance (Li, 2023). Furthermore, Ilies et al. (2009) pointed out that job satisfaction is closely related to employees' cognition and attitudes toward digital technologies, and those with higher satisfaction are more likely to actively participate in organizational changes, driving technological innovation and business improvement. Similarly, Zhu & Kraemer (2005) noted that higher employee satisfaction can significantly boost a company's innovation capacity and market responsiveness, maintaining a competitive job position in a fierce market environment.

Therefore, understanding the impact of digital transformation on employee job satisfaction not only helps improve employee work experience but also provides crucial insights for strategic decision-making. In summary, during the digital transformation process, companies should highly value employees' cognition and attitudes towards new technologies, implementing effective training and support measures to enhance job satisfaction. This not only ensures smooth transformation but also drives digital innovation and sustainable development. Against this backdrop, in-depth research on the impact of digital transformation on employee job satisfaction holds significant theoretical and practical importance.

1.1.2 Practical Background

In practice, manufacturing companies are actively promoting digital transformation to address challenges posed by market competition and technological changes. According to Fernández-Portillo (2024) and colleagues, who studied 1319 Spanish SMEs, there is a significant positive correlation between digital business ecosystems and employee satisfaction, which directly influences company performance. This indicates that successful digital transformation relies not only on advanced technologies but also on employees' acceptance and adaptation to these technologies. Currently, many companies face issues such as insufficient employee training and inadequate technical support when implementing digital transformation, leading to low acceptance of new technologies and decreased job satisfaction. Fernández-Portillo et al. also emphasize that companies should provide adequate training and support during digital transformation to help employees adapt to new work methods, enhancing their job satisfaction and performance. Furthermore, in practice, many companies optimize internal processes, introduce advanced technologies, and improve management methods to increase employees' understanding and acceptance of digital transformation (Castellacci & Viñas Bardolet, 2019). For instance, some companies conduct regular training, offer technical support, and establish incentive mechanisms to help employees better adapt to new technologies, thereby improving job satisfaction and overall performance (Farivar & Richardson, 2021). In conclusion, understanding and enhancing employee job satisfaction during digital transformation is crucial for successful transformation and sustainable development. This study aims to empirically analyze the specific impact of digital transformation on job satisfaction among manufacturing employees, providing practical insights and recommendations for corporate management.

1.2 Questions of the Study

1. How does digital transformation impact job satisfaction?
2. What are the differences in job satisfaction manifested by different employee groups?

1.3 Objectives of the Study

1. To examine the impact of digital transformation on job satisfaction.
2. To examine the differences in job satisfaction by different employee groups.

1.4 Scope of the Study

1) Scope of the Study

This study employed the quantitative research method to investigate the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Manufacturing Enterprise. By analyzing how changes in the utilization of digital resources, top management support, employee skill enhancement, and technological innovation influence employee job satisfaction, this research examined the effects of digital transformation on employee training and development, working environment, job performance, and work-life balance. Through these analyses, the study aimed to provide theoretical support and practical guidance for manufacturing enterprises in promoting digital transformation, enhancing operational efficiency, and ensuring employee job satisfaction.

2) Variable Scope

The variables in this study include:

Independent Variables:

Digital transformation, comprising four dimensions:

Digital Resources, Top Management, Employee Skills, and Technological Innovation.

Dependent Variables:

Employee job satisfaction, comprising four dimensions:

Employee Training & Development, Working Environment, Job Performance, and Work-life Balance.

Demographic Characteristics:

Including Gender, Age, Education, Job, and Department.

3) Population Scope

The target population of this study consisted of 10,000 employees at Chongqing Changan Automobile Manufacturing Enterprise. To ensure the representativeness of the sample and the reliability of the results, the Yamane formula was used to determine a sample size of 385 employees, ensuring a 95% confidence level and a 5% margin of error. However, to guarantee that the simple data met the minimum required quantity, the sample size was increased to 406. The sample random sampling method was employed to ensure the diversity and representativeness of the sample.

1.5 Significance of the Study

1.5.1 Theoretical Significance

The theoretical significance of this study lies in filling an important gap in existing research, specifically the impact of digital transformation on job satisfaction among manufacturing employees. Currently, most research focuses on the effects of digital transformation on operational efficiency and market competitiveness, with insufficient exploration of its impact on employees. For example, Chen et al. (2021) studied the enhancement of enterprise performance through digital technology but overlooked the crucial factor of employee satisfaction. Similarly, Zhang & Li (2020) focused solely on the overall benefits of digital transformation to enterprises. A review of databases such as Web of Science and Google Scholar reveals that relevant literature predominantly emphasizes enterprise-level analysis, lacking systematic studies on the employee level. Scholars like Brown (2020) & Garcia (2021) pointed out that future research should pay more attention to the psychological and behavioral effects of digital transformation on employees. This study systematically analyzes four dimensions-digital resource utilization, top management support, employee skill enhancement, and technological innovation-to reveal how these factors influence employee job satisfaction through digital transformation. Additionally, the study examines the differential impact of various demographic characteristics (such as gender, age, job position, and department) on digital transformation, providing new perspectives and theoretical foundations for understanding how different groups react to technological changes, thereby enriching the theoretical frameworks of organizational behavior and management.

1.5.2 Practical Significance

Firstly, analyzing the specific impact of digital transformation on employee job satisfaction can help enterprises better understand employees' feelings and needs during technological changes, thereby formulating more effective management strategies to enhance employee satisfaction and work enthusiasm. Secondly, the results of this study can guide enterprises in implementing digital transformation, ensuring that while improving operational efficiency, they also pay attention to employee career development and work-life balance. Existing studies, such as those by Brown (2020)

and Garcia (2021), mainly focus on the macro effects of technological changes, lacking analysis of micro-level employee experiences. The innovation of this study lies in combining quantitative research methods to systematically explore multiple dimensions of digital transformation and their comprehensive impact on employee satisfaction, providing enterprises with concrete operational suggestions and strategic support. Through these innovations, this study not only offers new theoretical frameworks to the academic community but also provides practical references for management practices in manufacturing enterprises, demonstrating significant application value and potential for widespread adoption.

1.6 Limitations of the Study

This study primarily employed the quantitative research method and used a questionnaire survey to collect data. While this method has many advantages, it also has certain limitations. The specific limitations are as follows:

1. Sample Limitation:

The sample for this study came from Chongqing Changan Automobile Manufacturing Enterprise. Although the sample size was determined using the Yamane formula and expanded to 406 participants, these samples may not fully represent the situations of other manufacturing enterprises. The generalizability of the results is somewhat limited and may not be applicable to manufacturing enterprises in other regions or industries.

2. Data Collection Method Limitation:

The questionnaire survey relies on self-reports from respondents, which may introduce subjective bias. Factors such as respondents' personal emotions, comprehension abilities, and response attitudes can affect the accuracy and reliability of the data. Additionally, the fixed options in the questionnaire design may limit respondents' ability to express complex viewpoints, potentially overlooking some important variables.

3. Time Limitation:

The data collection and analysis for this study were primarily focused on the year 2023. The results from this time point may not reflect the long-term impact of digital transformation on employee job satisfaction. Over time, employees' satisfaction and their adaptation to digital transformation may change. Moreover, the data collected from the questionnaire is time-sensitive and may not capture the dynamic changes in employee satisfaction as digital transformation progresses. Future research should consider extending the time frame to observe the long-term effects of digital transformation and use multiple data collection points to capture trends in employee satisfaction over time.

1.7 Terms and Definitions Used in This Study

1. Digital Transformation (DT):

Digital transformation is the systematic integration of digital technologies across all operational areas of a business, leading to a fundamental shift in how organizations operate and deliver value to their customers. This process encompasses not only the adoption of new technologies but also the reengineering of business processes and the transformation of organizational culture. In this study, digital transformation is measured through four key dimensions:

Digital Resources (DR): This dimension refers to the availability, accessibility, and management of digital tools, platforms, and systems that are essential for supporting the company's digital transformation efforts. It assesses whether the company has sufficient resources to implement its digital strategies (e.g., DR1: The company has sufficient resources to ensure the implementation of the digital transformation strategy) and the extent to which these resources are effectively utilized to avoid data pitfalls and ensure operational efficiency.

Employee Skills (ES): This dimension evaluates the digital competencies of employees, including their ability to use digital tools, data algorithms, and other advanced technologies to improve performance. It also examines whether employees' skills contribute to the company's overall digital transformation (e.g., ES2: The company places great emphasis on employees' digital capabilities). Skilled employees who can adapt to rapidly changing digital environments are essential for a successful transformation.

Top Management (TM): Refers to the role of senior leadership in supporting and driving digital transformation. This dimension measures whether top executives are transparent in formulating digital strategies, providing necessary resources, and coordinating efforts across departments (e.g., TM1: Top executives are transparent in formulating and implementing digital transformation strategies). Their active involvement ensures the smooth implementation of digital initiatives.

Technological Innovation (TI): This dimension assesses the company's ability to foster technological innovation, which is critical to advancing digital transformation. It measures whether the company integrates new technologies into its business models to enhance competitiveness (e.g., TI1: The current technological innovation capabilities of the company provide a solid foundation for digital transformation). Continuous innovation accelerates the digitalization process and opens new growth opportunities.

2. Employee Job Satisfaction (EJS):

Employee job satisfaction refers to the overall contentment of employees with various aspects of their job, including the work environment, job content, compensation, and career development opportunities. In this study, job satisfaction is assessed through four dimensions:

Employee Training & Development (ETD): This dimension evaluates the extent to which the company provides opportunities for employees to develop their digital skills and advance their careers. It measures whether training programs are in place and whether employees can effectively apply their newly acquired skills to their work (e.g., ETD2: The company provides sufficient professional digital skills training for employees). Continuous learning and development opportunities are essential for fostering employee satisfaction and performance.

Working Environment (WE): This dimension assesses the impact of digital transformation on the overall work environment, including the availability of modern equipment and the improvement of safety and work processes. It also measures whether the digital work environment fosters better collaboration among employees (e.g., WE3: Employees' work processes have been better optimized). A conducive and supportive work environment is crucial for employee well-being and productivity.

Job Performance (JP): Refers to how digital transformation has affected employee performance and job outcomes. This dimension evaluates whether performance evaluation criteria have become more reasonable and transparent, and whether employees are better matched with tasks that align with their skills (e.g., JP1: The standards for employee performance evaluation have become more reasonable and standardized). Job performance is closely tied to job satisfaction, as employees who perform well are more likely to feel fulfilled in their roles.

Work-life Balance (WB): This dimension examines how well employees can balance their work responsibilities with personal life, especially in a digitally enhanced work environment. It measures the company's efforts to support employees' work-life balance, including providing flexible work options and family-friendly benefits (e.g., WB2: Employees have enough time to handle personal life issues). Achieving a healthy work-life balance is essential for maintaining employee satisfaction and reducing burnout.

3. Digital Resources (DR): Refers to information resources accessible via computers and other digital devices, including text, images, audio, video, and interactive content. Adequate digital resources are crucial for the successful implementation of digital transformation. Songer (2007) noted that sufficient digital resources not only support the smooth conduct of daily business but also provide necessary data support and analysis tools for innovation and improvement.

4. Employee Skills (ES): Refers to the abilities and knowledge that employees acquire through training or work experience to perform specific tasks. Highly skilled employees are better equipped to handle complex work tasks and adapt to the rapidly changing digital environment. Prezioso et al. (2020) stated that employees' digital skills are a key factor in the successful implementation of digital transformation, as these skills directly impact employees' work efficiency and innovation capabilities.

5. Top Management (TM): Refers to the highest level of management in an organization, responsible for strategic planning, policy-making, and major decisions. The support and involvement of top management are critical to the success of digital transformation. Wrigley (1988) and Mojambo (2020) highlighted that effective top management can provide necessary resources and support, as well as guide organizational change through clear vision and leadership, ensuring coordination and consistency during the digital transformation process.

6. Technological Innovation (TI): Refers to innovations in production technology, including the development of new technologies and the reinvention of existing technologies. Technological innovation can drive the differentiation of enterprise products and services, giving them a competitive advantage. Chen (2015) pointed out that technological innovation can not only improve production efficiency but also support the exploration of new markets and business models, serving as a crucial driver of digital transformation.

7. Employee Training & Development (ETD): Refers to the process of enhancing employees' abilities and knowledge through learning and development programs to increase their skills and work efficiency. Tahsildari & Shahnaei (2015) argued that systematic training and development programs can improve employees' professional skills, job satisfaction, and sense of belonging, thereby bringing long-term benefits to the enterprise.

8. Working Environment (WE): Refers to the physical and social conditions under which employees work, including the safety, comfort, and supportiveness of the workplace. Raziq and Maulabakhsh (2015) noted that a good working environment can enhance employees' job satisfaction, reduce stress and anxiety, and improve overall work performance and organizational loyalty.

9. Job Performance (JP): Refers to the productivity and efficiency displayed by employees in their work. Digital transformation can significantly enhance job performance by optimizing business processes and introducing advanced technologies. Malkanthi & Ali (2016) found that improvements in job performance not only enhance enterprise production efficiency but also increase employees' sense of achievement and satisfaction.

10. Work-life Balance (WLB): Refers to the balance between an employee's work roles and personal life, including participation and satisfaction in both work and personal life. Brough et al. (2020) pointed out that a good work-life balance helps improve employees' overall satisfaction and quality of life, reducing job burnout and turnover intentions.

11. Chongqing Changan Automobile Manufacturing Enterprise (Changan Automobile): Established in 1862, it is one of the oldest and largest automobile manufacturing enterprises in China. Headquartered in Chongqing, its main businesses cover the research, manufacturing, and sales of passenger cars, commercial vehicles, and new energy vehicles. Changan Automobile focuses on innovation and technological research and development, aiming to provide high-quality automobile products and services to customers. In recent years, the company has actively promoted digital transformation to enhance its overall competitiveness and sustainable development capability.



Chapter 2 Literature Review

2.1 Introduction

This chapter provides a comprehensive review of the current literature on digital transformation and employee job satisfaction. By exploring the definitions, driving factors, implementation strategies, and impacts of digital transformation, as well as the key factors influencing employee job satisfaction, this review aims to lay the theoretical foundation for this study. This analysis identified existing research gaps and established the theoretical basis for the present study, providing a solid framework for further research.

2.2 Literature Review

2.2.1 Digital Transformation

1. Definition of Digital Transformation:

Digital transformation refers to the systematic changes within a company's business processes, organizational structure, and corporate culture through the adoption of various digital technologies and tools, aimed at improving productivity, enhancing competitiveness, and fostering business innovation (Vial, 2019). This transformation not only involves the application of technology but also deep structural changes in management models and organizational frameworks. Westerman et al. (2014) emphasize that digital transformation is a systemic process through which companies improve customer experience, operational efficiency, and business models using digital technology.

2. Drivers of Digital Transformation:

Existing research indicates that several factors drive companies to undertake digital transformation:

2.1) Technological Advancements:

Technological advancements are one of the primary drivers of digital transformation. In recent years, the rapid development of big data, cloud computing, the Internet of Things (IoT), and artificial intelligence (AI) has provided companies with robust technological support. These technologies enhance data processing and analysis capabilities, significantly improving operational efficiency and decision-making abilities. For instance, big data technology allows companies to extract valuable insights from vast amounts of data, providing deep market understanding and customer behavior analysis (Bharadwaj et al., 2013). Cloud computing offers flexible and scalable computing resources, reducing IT costs and enabling rapid application deployment and updates. IoT technology connects devices and systems, allowing real-

time data collection and transmission, enhancing real-time monitoring and management of production and operations. AI improves the efficiency and accuracy of business processes through automation and intelligent processing. Technological advancements provide the necessary tools and means for companies to drive digital transformation and are the core force behind it.

2.2) Market Competition:

Intensified market competition forces companies to enhance competitiveness through digital means. Globalization and rapid changes in market environments require companies to continually innovate and improve efficiency to cope with competitive pressure. Kane et al. (2015) stated that digital transformation can help companies optimize supply chain management, improve customer service quality, and accelerate product development cycles, better responding to market demands and changes. Digital means allow companies to achieve more efficient resource allocation and business operations, maintaining a leading job position in a competitive market. For example, Amazon uses digital platforms and data analysis to achieve efficient logistics and inventory management, significantly enhancing customer satisfaction and market share. Digital transformation helps companies not only improve the efficiency of existing businesses but also explore new markets and business areas, creating new growth points.

2.3) Customer Expectations:

With the widespread adoption of digital technology, customer expectations for products and services are continually increasing. Modern consumers expect more convenient, personalized, and high-quality service experiences. Henriette et al. (2015) suggested that digital technology can greatly enhance customer experience. Through online platforms and mobile applications, companies can provide 24/7 services and meet personalized needs through customized recommendations and services. Customer data analysis enables companies to deeply understand customer preferences and behaviors, offering precise marketing and services. For instance, Netflix uses data analysis technology to recommend content based on users' viewing histories and preferences, greatly improving user satisfaction and engagement. Digital transformation helps companies build closer relationships with customers, enhancing customer loyalty and brand value.

2.4) Internal Needs:

Internal needs are also crucial drivers of digital transformation. To improve operational efficiency, reduce costs, and optimize business processes, companies need to adopt digital means for internal management and operational improvements. Sebastian et al. (2017) indicated that digital transformation can help companies achieve internal operational optimization through process automation, resource utilization efficiency, and enhanced data-driven decision-making capabilities. Implementing ERP

systems enables data sharing and business coordination across departments, improving overall operational efficiency. Automation technology reduces manual operations and errors, enhancing the quality and consistency of production and services. For example, Siemens achieves smart manufacturing and full-process automation through Industry 4.0 technology, significantly improving production efficiency and product quality. Data analysis and AI technologies optimize supply chain management, forecast market demand, and formulate precise business strategies, enhancing the company's competitiveness and market responsiveness.

In summary, technological advancements, market competition, customer expectations, and internal needs are the primary factors driving companies towards digital transformation. These factors collectively push companies to seek digital means to enhance operational efficiency, competitiveness, and customer satisfaction, ensuring success in a rapidly changing market environment. Systematic digital transformation enables companies not only to improve the efficiency of existing operations but also to create new business models and market opportunities, securing sustained competitive advantages in the future.

3. Implementation Strategies for Digital Transformation:

Digital transformation is a complex and systematic process. Different companies may adopt various strategies, but key steps can generally be summarized as follows. This section aims to provide a theoretical foundation and practical guidance for manufacturing companies undertaking digital transformation.

3.1) Setting Strategic Goals:

Establishing clear strategic goals: This is the first step to successful digital transformation. Ross et al. (2016) highlighted the importance of companies defining the goals and directions of digital transformation, ensuring a unified understanding and consensus on the objectives and expected outcomes throughout the organization. Strategic goals typically include:

Enhancing customer experience: Improve customer service processes using digital technology to provide more personalized and efficient service experiences. For example, retail companies can use big data analysis to understand customer needs, offering personalized recommendations and promotions to increase customer satisfaction and loyalty.

Optimizing operational processes: Use automation and intelligent methods to optimize internal processes, reduce manual interventions and errors, and increase efficiency and productivity. Manufacturing companies can implement IoT technology

for real-time monitoring and maintenance of equipment, improving production line stability and efficiency.

Innovating business models: Utilize digital technology to explore and create new business models, achieving diversification and multi-channel revenue streams. Traditional manufacturing companies can establish e-commerce platforms to expand online sales channels, increasing revenue sources.

3.2) Technology Investment:

Technology investment is the foundation of digital transformation. Fitzgerald et al. (2014) noted that companies need to invest adequate resources in digital technology research and application to maintain a competitive technological edge. Key aspects of technology investment include:

Infrastructure development: Establish and enhance IT infrastructure, such as cloud computing platforms, data centers, and network equipment, ensuring robust technical support and data processing capabilities.

Technology research and development: Continuously invest in the research and application of cutting-edge technologies like AI, IoT, big data analysis, and blockchain to maintain technological leadership.

System integration: Achieve seamless integration of new and old systems, ensuring compatibility and coordination among various technology platforms and systems. For instance, integrating traditional ERP systems with emerging cloud computing platforms for real-time data sharing and intelligent business management.

3.3) Cultural Change:

Cultural change is a key factor for successful digital transformation. Westerman et al. (2011) argued that companies need to drive cultural shifts towards openness, innovation, and collaboration to meet the demands of the digital era. Key aspects of cultural change include:

Openness and transparency: Establish open and transparent communication mechanisms, encouraging employees to share opinions and suggestions, enhancing their involvement and recognition of the transformation process.

Spirit of innovation: Cultivate and incentivize employees' innovative spirit, encouraging attempts and risks, and tolerating failures and mistakes, thereby creating a vibrant and innovative corporate culture.

Collaboration and cooperation: Break down departmental silos and promote cross-departmental and cross-functional cooperation to jointly drive digital transformation implementation. For example, forming cross-departmental project teams to brainstorm and solve complex problems.

3.4) Talent Development:

Talent development ensures digital transformation success. Hess et al. (2016) stated that companies need to enhance employees' digital skills and innovation capabilities through training and development programs to meet the demands of digital transformation. Key aspects of talent development include:

Skill training: Provide systematic digital skills training to help employees master new technologies and tools, such as data analysis, programming, and cybersecurity, enhancing their professional abilities and work efficiency.

Career development: Offer clear career development paths and promotion opportunities to motivate continuous learning and progress, enhancing their loyalty and sense of belonging to the company.

Innovation capability: Provide practice opportunities and innovative environments through innovation projects and labs, stimulating employees' creativity and innovation capabilities. For example, establishing innovation labs where employees can participate in real projects, honing their innovative thinking and practical skills.

In summary, setting strategic goals, technology investment, cultural change, and talent development are key strategies companies must adopt in the digital transformation process. These strategies provide a solid foundation and guarantee for digital transformation, supporting companies in maintaining a leading job position in a competitive market environment. Through systematic and comprehensive digital transformation strategies, companies can achieve operational efficiency improvements, business model innovation, and customer experience optimization, securing sustained competitive advantages in the digital era.

4. Key Factors in Digital Transformation:

Digital transformation involves utilizing technology to enhance overall business performance (Westerman, 2014). Companies' intentions for digital transformation can be categorized into two types: gaining competitive advantage through digitalization of production information and building digital infrastructure (Kohli & Johnson, 2011), and strengthening customer interaction by digitalizing sales and communication channels (Andrašec et al., 2021). For companies, this transformation involves business operations and customer value delivery, affecting corporate culture and interpersonal

relationships (Mičić, 2017). To better promote digital transformation, various scholars have analyzed factors influencing this process. Liere-Netheler (2018) identified 12 driving factors in manufacturing digital transformation: process improvement, workplace enhancement, vertical integration, management support, horizontal integration, cost reduction, customer demand, supply chain, innovation push, market pressure, legal/government, and employee support. Zhang (2022) emphasized the impact of digital transformation on companies from technological, organizational, and environmental perspectives, highlighting how technology and work environments enhance organizational capabilities and promote successful digital transformation. Ahmad (2021) proposed six key indicators: organizational agility, operational flexibility, customer-centric measures, digital resources, product and service value propositions, and transition management. Building on this research, this study references Li (2023) to identify key factors affecting employee job satisfaction during digital transformation. The study selects four key indicators to measure digital transformation: digital resources, top management, employee skills, and technological innovation.

Table 2.1 Selection of Key Factors of Digital Transformation

Factors	Define
Digital resources	Digital resources refer to any sources of information that can be utilized on a computer, typically containing valuable information and presented in forms such as text, images, simulations, videos, or other interactive formats (Songer, 2007). Possessing sufficient digital resources forms the foundation for enterprises to swiftly complete digital transformation.
Employee skills	Skills are abilities acquired through specialized training, enabling individuals to perform specific tasks and achieve particular objectives. Highly skilled employees can handle complex work tasks and quickly adapt to ever-changing environments, which is crucial for an organization's digital transformation (Prezioso et al., 2020).
Top management	Top management includes the highest-level executives responsible for the long-term planning, policy-making, and major decision-making of an enterprise. An efficient top management team can formulate effective strategies, ensuring that the enterprise stays on track during the digital transformation process (Mojambo, 2020).
Technological innovation	Technological innovation refers to innovations in production technology, including the development of new technologies, the application of existing technologies, and re-innovation (Li, 2023). Technological innovation can differentiate products, helping enterprises gain a competitive advantage in the market.

Source: This Study Summarized

2.2.2 Employee Job Satisfaction

1) Definition of Employee Job Satisfaction

Employee job satisfaction is a multi-dimensional concept that encompasses an employee's overall satisfaction with various aspects of their job, including work environment, job content, compensation, and career development opportunities.

Understanding this concept is crucial for managers to develop effective employee motivation and retention strategies. Locke (1976) defined job satisfaction as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences." This definition emphasizes the emotional and attitudinal components of job satisfaction, reflecting employees' subjective feelings and attitudes towards their work. Positive evaluations of the work environment, tasks, and interpersonal relationships typically lead to higher job satisfaction. This emotional state not only affects employees' work performance and behavior but also impacts their mental health and quality of life. Spector (1997) further elaborated that job satisfaction is a multi-dimensional concept, including the following key aspects:

Table 2.2: Definitions of the Multi-dimensional Concept of Job Satisfaction

Dimension	Definition	References
Job Tasks	Refers to the degree of satisfaction employees have with their job content and tasks. Task variety, challenge, and sense of meaning all impact job satisfaction.	Hackman & Oldham (1976)
Work Conditions	Includes the physical work environment (e.g., office facilities, safety, comfort) and organizational environment (e.g., management style, company policies, work schedule).	Herzberg (1968)
Colleague Relations	Refers to the interactions and relationships between employees and their colleagues. Positive colleague relationships and team cooperation can enhance job satisfaction and sense of belonging.	Robbins & Judge (2013)
Compensation and Benefits	A fair and competitive compensation system along with comprehensive benefits policies are key factors in improving job satisfaction.	Judge et al. (2010)
Career Development	Includes training opportunities, promotion prospects, and career growth space. Employees who see personal development opportunities in their work typically exhibit higher job satisfaction.	Noe (2008)

2) Factors Influencing Employee Job Satisfaction and Outcomes

Factors influencing employee job satisfaction include job tasks, work conditions, colleague relations, compensation and benefits, and career development. Job tasks involve the degree of satisfaction employees derive from their job content and tasks, with task variety, challenge, and sense of meaning affecting job satisfaction (Hackman & Oldham, 1976). Work conditions encompass both physical work environments (e.g., office facilities, safety, comfort) and organizational environments (e.g., management style, company policies, work schedule), with favorable work conditions reducing employee stress and dissatisfaction and enhancing satisfaction (Herzberg, 1968). Colleague relations pertain to interactions and relationships among employees, with positive relations and team cooperation boosting job satisfaction and a sense of belonging (Robbins & Judge, 2013). Compensation and benefits refer to fair and competitive compensation systems and comprehensive benefits policies, with

significant positive correlations found between compensation and job satisfaction (Judge et al., 2010). Career development includes training opportunities, promotion prospects, and career growth, with employees perceiving personal development opportunities in their work typically exhibiting higher job satisfaction (Noe, 2008). These factors collectively determine the overall satisfaction employees have with their work environment and experience.

Higher job satisfaction is generally associated with higher job performance. Satisfied employees are more likely to demonstrate high levels of job performance and creativity because they find pleasure and a sense of achievement in their work (Judge et al., 2001). Job satisfaction is closely linked to employee turnover intentions, with higher satisfaction reducing turnover rates and lowering organizational talent loss. Satisfied employees are more inclined to stay with the organization and display higher loyalty (Griffeth et al., 2000). Satisfied employees typically show higher commitment and loyalty to the organization, contributing to organizational stability and development (Meyer & Allen, 1991). Additionally, higher job satisfaction improves organizational work atmosphere, promoting teamwork and employee enthusiasm, with satisfied employees more willing to participate in organizational activities, fostering a positive and harmonious work environment (Ostroff, 1992). Understanding these outcomes helps organizations formulate strategies to enhance job satisfaction, thereby achieving overall organizational effectiveness and sustainable development.

3) Impact of Employee Job Satisfaction on the Organization

Employee job satisfaction impacts various organizational aspects, including job performance, employee retention, organizational commitment, organizational atmosphere, and customer satisfaction. Firstly, high job satisfaction is positively correlated with high job performance. Research shows that satisfied employees exhibit higher efficiency and creativity in their work, as they find joy and a sense of achievement in their tasks (Judge et al., 2001). Additionally, job satisfaction can motivate employees intrinsically, encouraging more innovative behaviors and proactiveness in their work. Thus, improving employee job satisfaction can significantly enhance overall organizational productivity and competitiveness. High job satisfaction also significantly reduces employee turnover rates, decreasing organizational talent loss (Griffeth et al., 2000). Satisfied employees have a stronger sense of identification and belonging to the organization and are less likely to be attracted by external opportunities. Enhancing employee job satisfaction can help organizations reduce recruitment and training costs for new employees, maintain organizational knowledge and skills, and promote long-term development.

Secondly, there is a significant positive correlation between job satisfaction and organizational commitment (Meyer & Allen, 1991). Satisfied employees typically exhibit higher affective commitment to the organization, willing to work for the organization's goals and interests. High job satisfaction also enhances employees' continuance commitment, making them more likely to stay with the organization for the long term. By improving employee job satisfaction, organizations can enhance employee loyalty and commitment, thereby increasing organizational stability and cohesion. Furthermore, high job satisfaction improves the internal work atmosphere, promoting teamwork and employee enthusiasm. Satisfied employees are more willing to participate in organizational activities, fostering a positive and harmonious work environment (Ostroff, 1992). A good organizational atmosphere not only helps improve employee job satisfaction but also enhances team collaboration efficiency and innovation capacity.

Lastly, employee job satisfaction indirectly affects customer satisfaction and loyalty. Heskett et al. (1997) proposed the Service Profit Chain theory, suggesting that employee job satisfaction directly influences service quality, with high-quality service enhancing customer satisfaction and loyalty. Satisfied employees usually demonstrate more enthusiasm and professionalism in their interactions with customers, improving customer experience and satisfaction. Higher customer satisfaction helps retain existing customers and attract new ones through word-of-mouth, bringing more market opportunities and revenue growth to the organization. Thus, understanding and enhancing employee job satisfaction is crucial for long-term organizational success. These impacts not only help organizations achieve success in the current market environment but also lay a solid foundation for their future sustainable development.

4) Key Dimensions of Employee Job Satisfaction

Job satisfaction is a multi-dimensional construct that has evolved from organizational theory and includes various key dimensions. These dimensions represent different aspects of employees' experiences within an organization and are crucial for understanding overall job satisfaction. High employee job satisfaction can lead to better job performance and reduced turnover intention (Waqas, 2014). Statt (2004) highlighted that job satisfaction reflects the level of contentment employees feel towards the rewards they receive from their work, acting as a source of intrinsic motivation. However, job rewards represent just one dimension of job satisfaction.

Scholars such as Kamal & Hanif (2009) and Sowmya and Panchanatham (2011) emphasized that various dimensions—such as compensation, promotion opportunities, and interpersonal relationships—are integral to measuring job satisfaction. Neog & Barua (2014) further noted that the working environment, supervisor support, job security, work-life balance, career advancement opportunities, and training and

development opportunities are essential dimensions that contribute to an employee's sense of satisfaction.

Based on Maslow's Hierarchy of Needs theory, this study identifies the following four key dimensions to measure employee job satisfaction:

Table 2.3 Key Dimensions of Employee Job Satisfaction

Key Factors	Definition	Maslow's Hierarchy of Needs
Employee Training & Development	Defined as the process of improving employee capabilities through learning or attitude changes to enhance their skills and knowledge, thereby increasing work efficiency (Tahsildari & Shahnaei, 2015)	Self-actualization Needs
Job Performance	Directly related to employee productivity; digital transformation can help improve job performance (Malkanthi & Ali, 2016)	Esteem Needs
Working Environment	Includes the execution and completion of work and the physical and social work conditions (Raziq & Maulabakhsh, 2015)	Safety Needs
Work-life Balance	Refers to employees' engagement and satisfaction with their work and family roles (Brough et al., 2020)	Physiological and Social Needs

2.2.3. Demographic Characteristics

The impact of digital transformation on differences in job satisfaction by different employee groups: Previous research indicates that factors such as gender, age, educational background, job position, and department significantly influence job satisfaction. For instance, gender is a relatively important factor. Men and women exhibit differences in family demands, work motivation, and work behavior, which may result in different levels of job satisfaction (Emmanuel & Agaha, 2021). Younger employees generally display greater adaptability and flexibility, more readily accepting new technologies and work methods (Ng & Feldman, 2010). Younger employees may exhibit higher satisfaction during digital transformation due to their familiarity with digital tools and technologies. In contrast, older employees may face more challenges in adapting to new technologies, potentially leading to dissatisfaction during the transformation process (Riza et al., 2018). Additionally, employees with different educational backgrounds, job positions, and departments encounter varying degrees of digital transformation and technology application. For example, lower- job position employees may experience increased pressure and uncertainty as their workflows and responsibilities undergo significant changes due to digital transformation, leading to decreased job satisfaction (Li, 2023). Therefore, it is evident that digital transformation significantly impacts differences in job satisfaction by different employee groups. Providing customized training and support for employees with varying technical levels across departments is crucial during the digital transformation process (Appelbaum et al., 2012).

In summary, this study analyzes the differences in job satisfaction by different employee groups based on their demographic characteristics, cognitive attitudes, and acceptance levels of technology, further exploring the impact of digital transformation on job satisfaction.

2.3 Theory Review

This study, based on Maslow's Hierarchy of Needs theory, investigates the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Manufacturing Enterprise. Maslow's Hierarchy of Needs, proposed by psychologist Abraham Maslow in 1943, posited that human needs are arranged in a hierarchy from lower to higher levels: physiological needs, safety needs, social needs, esteem needs, and self-actualization needs. This theory provides a robust framework for understanding employee job satisfaction at different levels of need. This study correlates key factors of employee job satisfaction with Maslow's hierarchy, as detailed below:

1) Employee Training and Development (Self-Actualization Needs)

Employee training and development are defined as the process of improving employees' capabilities through learning or attitude changes, thereby increasing their skills and knowledge and enhancing work efficiency (Tahsildari & Shahnaei, 2015). In Maslow's hierarchy, self-actualization needs represent the highest level of need, symbolizing the pursuit of maximizing one's potential and personal growth. During digital transformation, employees need to continuously learn and adapt to new technologies, which provides ample opportunities for training and development, helping them achieve self-actualization. Comprehensive training and development programs not only enhance employees' skills and knowledge but also stimulate their intrinsic motivation, boosting their job satisfaction. Therefore, companies should prioritize employee training and development during digital transformation to meet their self-actualization needs and improve overall job satisfaction.

2) Job Performance (Esteem Needs)

Job performance is directly related to employee productivity, and digital transformation can help improve job performance (Malkanathi & Ali, 2016). In Maslow's hierarchy, esteem needs include self-respect and respect from others. Enhanced job performance can satisfy employees' esteem needs, as efficient work performance boosts their sense of achievement and self-confidence and earns recognition and respect from colleagues and superiors. Digital transformation optimizes work processes and introduces advanced technologies, improving employees' work efficiency and quality, thereby increasing their job satisfaction. Therefore, companies should focus on

enhancing job performance during digital transformation to fulfill employees' esteem needs.

3) Work Environment (Safety Needs)

The work environment includes the execution and completion of work, as well as physical and social work conditions (Raziq & Maulabakhsh, 2015). In Maslow's hierarchy, safety needs refer to an individual's need for safety and stability. A good work environment can reduce employee stress and anxiety, enhancing their job satisfaction. Digital transformation improves work processes and provides better work equipment, enhancing the work environment and meeting employees' safety needs. For example, the introduction of automated equipment can reduce physical labor, increasing work safety and comfort. Therefore, companies should pay attention to employees' work environment during digital transformation to ensure they work in a safe and comfortable environment, thereby improving their satisfaction.

4) Work-Life Balance (Physiological and Social Needs)

Work-life balance refers to employees' engagement and satisfaction with their work and family roles (Brough et al., 2020). In Maslow's hierarchy, physiological and social needs represent basic needs, indicating an individual's need for basic living conditions and social relationships. Work-life balance helps employees meet their basic physiological needs while maintaining good social relationships, improving their overall quality of life and job satisfaction. Digital transformation can help employees better balance work and life through flexible work arrangements and advanced communication technologies, thereby enhancing their satisfaction. For instance, remote work and flexible working hours enable employees to better manage both work and family responsibilities. Therefore, companies should establish flexible work policies during digital transformation to help employees balance work and life, fulfilling their physiological and social needs.

By integrating Maslow's Hierarchy of Needs theory, this study aims to systematically analyze the impact of digital transformation on employee job satisfaction. Specifically, employee training and development, job performance, work environment, and work-life balance correspond to self-actualization needs, esteem needs, safety needs, and physiological and social needs in Maslow's hierarchy, respectively. Understanding these needs is crucial for companies to develop effective employee management strategies during digital transformation, enhancing employee job satisfaction. By meeting employees' needs at different levels, companies can not only improve job satisfaction but also enhance job performance, strengthen organizational commitment, reduce employee turnover, and ultimately achieve sustainable development.

2.4 Research Relevant

This study aims to explore the impact of digital transformation on employee job satisfaction in manufacturing enterprises. Digital transformation enhances work efficiency and employee performance by introducing advanced technologies such as big data, artificial intelligence, and automation equipment. Bharadwaj et al. (2013) pointed out that the effective utilization of digital resources improves operational efficiency and employee satisfaction. The study by Chen et al. (2021) shows that the application of digital technologies not only enhances production efficiency but also increases employee job satisfaction. Furthermore, digital transformation provides more career development opportunities and skill enhancement pathways for employees. Noe (2008) argued that systematic training programs significantly improve employee skills and job satisfaction. The application of digital technologies also improves the work environment, enhancing the comfort and safety of working conditions (Raziq & Maulabakhsh, 2015).

However, digital transformation can also have negative effects on employee job satisfaction. Employees constantly need to learn and adapt to new technologies, which can bring about stress and uncertainty. Brown (2020) noted that while skill enhancement can increase job security, rapid technological changes may cause anxiety and discomfort, especially for older employees or those with weaker technical foundations. Although digital transformation improves work efficiency, it may blur the boundaries between work and life, increasing employees' workload. Brough et al. (2020) emphasized that work-life balance is crucial to overall job satisfaction. High-intensity work rhythms and prolonged online working modes may affect employees' family life and job satisfaction.

Overall, the impact of digital transformation on employee job satisfaction is complex. On one hand, it improves work efficiency, career development opportunities, and the work environment, enhancing employee job satisfaction. On the other hand, the pressure to adapt to new technologies, challenges in work-life balance, and unequal opportunities for skill enhancement may decrease employee satisfaction. A review of existing literature reveals the diversity and complexity of these impacts. This study will further explore these effects to provide more targeted management recommendations and practical guidance for enterprises during digital transformation, ultimately enhancing employee job satisfaction and achieving sustainable development.

2.5 Conceptual Framework

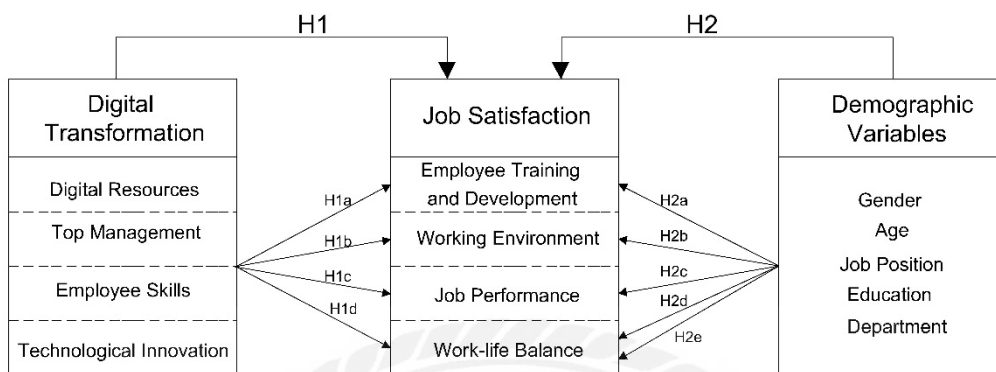
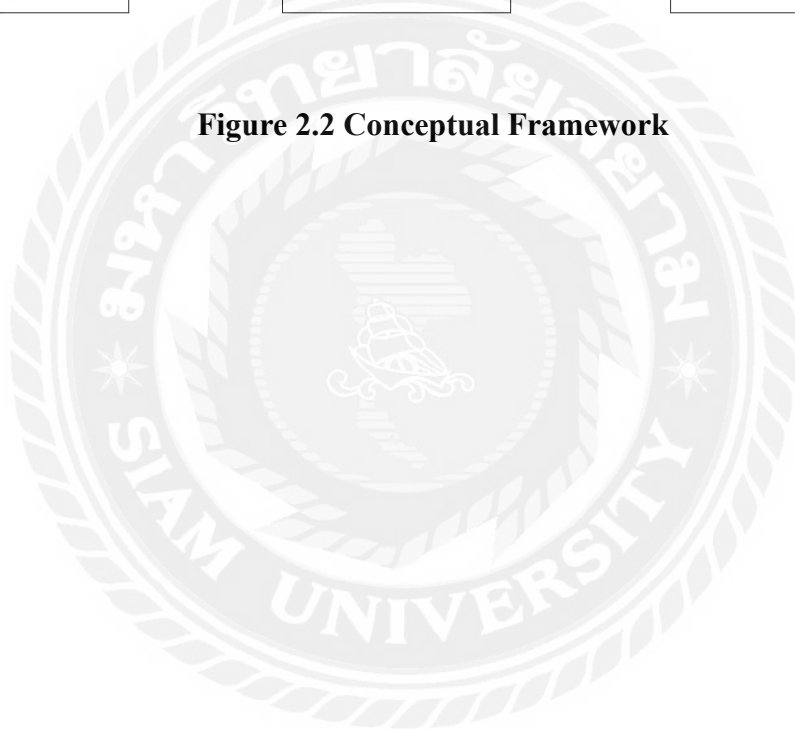


Figure 2.2 Conceptual Framework



Chapter 3 Research Methodology

3.1 Introduction

This study adopted the quantitative research method, utilizing a questionnaire survey to explore the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Manufacturing Enterprise. This chapter on research methodology systematically describes the research design, sample selection, data collection methods, and analytical techniques used to achieve the research objectives. By employing a quantitative research approach, this study aimed to provide empirical evidence on the relationship between various dimensions of digital transformation and different aspects of employee job satisfaction.

3.2 Research Design

This study aimed to explore the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Manufacturing Enterprise and analyze the satisfaction differences by different employee groups in this process. Based on the research objectives and perspectives, a quantitative research method was chosen. This method can provide objective, systematic, and repeatable data through standardized scales and statistical analysis methods. It helps accurately measure and compare relationships between different variables, especially when the research involves multi-dimensional factors and large sample data, thus improving the reliability and validity of the research results. Additionally, the quantitative research method allows the collection of a large amount of data through surveys, facilitating in-depth analysis using statistical tools, and providing targeted management recommendations and practical guidance. Therefore, this study is divided into two parts, as follows:

Part 1: Objective 1

The study designed a questionnaire based on the digital transformation measurement scale by Li (2023) and collected data through questionnaires. The questionnaire includes four dimensions of digital transformation (Digital Resources, Employee Skills, Top Management, Technological Innovation) and four dimensions of employee job satisfaction (Employee Training & Development, Working Environment, Job Performance, Work-life Balance). The questionnaire items use a five-point Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree."

Table 3.1 Digital Transformation Measurement Scale

Digital Resources (DR)
DR1. The company has sufficient resources to ensure the implementation of the digital transformation strategy.
DR2. The company can quickly obtain production information and other resources through various digital channels.

Digital Resources (DR)
DR3. The company can effectively avoid big data pitfalls and extract useful data information.
DR4. The company has a professional digital resource management team.
Employee Skills (ES)
ES1. The company has a large number of digital professionals.
ES2. The company places great emphasis on employees' digital capabilities.
ES3. Employees' digital skills have created higher performance for the team.
ES4. Employees are proficient in using various data algorithms to analyze and mine data information.
Top Management (TM)
TM1. Top executives are transparent in formulating and implementing digital transformation strategies.
TM2. Top executives can usually provide various facilities, such as digital equipment and appropriate software, to support the development of digital transformation.
TM3. Top executives can effectively coordinate conflicts and disputes between different departments during digital transformation.
TM4. Top executives have a positive attitude towards building and managing a digital environment or culture.
Technological Innovation (TI)
TI1. The current technological innovation capabilities of the company provide a solid foundation for digital transformation.
TI2. The company's technological innovation planning is closely integrated with the development of digital transformation.
TI3. Technological innovation has accelerated the company's digital process.
TI4. Technological innovation provides more development directions for the company's digital transformation.

Table 3.2 Employee Job Satisfaction Measurement Scale

Employee Training & Development (ETD)
ETD1. The company has clear goals for developing employees' digital capabilities.
ETD2. The company provides sufficient professional digital skills training for employees.
ETD3. Employees can well apply the new skills/knowledge they have acquired to actual work.
ETD4. The company can create better career paths or more career development opportunities for employees.
Working Environment (WE)
WE1. The company's digital transformation has provided better work equipment for employees.
WE2. Digital facilities have improved workers' safety at work.
WE3. Employees' work processes have been better optimized.
WE4. Changes in work environment and modes have positively influenced the coordination between employees.
Job Performance (JP)
JP1. The standards for employee performance evaluation have become more reasonable and standardized.
JP2. Employees can easily complete tasks that were previously difficult.
JP3. The company can better match work with employees' talents.
JP4. Each link in the work process is more transparent, making it easier for employees to handle emergencies.
Work-life Balance (WB)
WB1. Employees can manage their time more effectively to handle various work-related issues.
WB2. Employees have enough time to handle personal life issues.

Work-life Balance (WB)
WB3. With family support, employees are more likely to focus on work.
WB4. The company shows its care for employees' work-life balance through family benefits (e.g., New Year gifts, movie tickets) to help them balance work and family time.

Part 2: Objective 2

The quantitative research method was adopted to collect data through questionnaires. The questionnaire gathers demographic information, including gender, age, education level, job position and department, to analyze the differences in job satisfaction by different employee groups in the context of digital transformation.

Table 3.3 Demographic Characteristics

Variable	Question items
Gender	A. Male B. Female
Age	A. 21-25 B. 26-30 C. 31-35 D. 36-40 E. 41 and above
Education	A. College and below B. Bachelor's C. Master's and above
Job Position	A. Senior Management B. Middle Management C. General Staff
Department	A. Front Office B. Production Process C. Supply Chain D. Human Resources, Finance, and Materials Department E. Business Operations

3.3 Hypothesis

H1: Digital transformation has a positive impact on employee job satisfaction.

H1a: Digital transformation has a positive impact on employee training and development.

H1b: Digital transformation has a positive impact on working environment.

H1c: Digital transformation has a positive impact on job performance.

H1d: Digital transformation has a positive impact on work-life balance.

H2: Differences in employees' demographic characteristics have a significant impact on employee job satisfaction.

H2a: Employees' gender has a positive impact on employee training and development.

H2b: Employees' age has a positive impact on the working environment.

H2c: Employees' education has a positive impact on job performance.

H2d: Employees' job position has a positive impact on employees' work-life balance.

H2e: Employees' department has a positive impact on employees' work-life balance.

3.4 Sampling and Sample Size

This study employed the quantitative research method to investigate the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Manufacturing Enterprise. The target population consisted of 10,000 employees. The sample size was determined using the Yamane formula, ensuring a 95% confidence level and a 5% margin of error, resulting in a sample size of 385 employees. However, to ensure that the sample data met the minimum requirement of 385 responses, a simple random sampling method was used to select the sample, ensuring the representation of employees from various departments.

$$N = \frac{N}{1+(Ne^2)}$$

(Equation 3-1)

3.5 Data Collection

A total of 500 questionnaires were distributed, and 452 responses were collected, achieving a response rate of 90.4%. During data preprocessing, 46 questionnaires were excluded due to incorrect, missing, or logically inconsistent demographic information, resulting in 406 valid questionnaires for analysis.

The questionnaire includes demographic information and scales for research variables, covering four dimensions of digital transformation (digital resources, employee skills, top management, and technological innovation) and four dimensions of employee job satisfaction (employee training and development, working environment, job performance, and work-life balance).

The questionnaire items use a five-point Likert scale, where 1 indicates "strongly disagree" and 5 indicates "strongly agree." The survey was completed within three weeks.

3.6 Reliability and Validity Analysis of the Scale

3.6.1 Reliability Analysis

Reliability refers to the consistency and stability of measurement results under different times and situations. This study used Cronbach's Alpha coefficient to evaluate the internal consistency reliability of the scale. The closer the Cronbach's Alpha coefficient is to 1, the higher the internal consistency of the scale. Generally, a Cronbach's Alpha coefficient greater than 0.70 is considered acceptable. This study analyzed the Cronbach's Alpha coefficients of various dimensions (digital resources, employee skills, top management, technological innovation, employee training and development, working environment, job performance, and work-life balance) to ensure the internal consistency of the scale. The analysis results are shown in Table 3.4.

Table 3.4 Reliability Test of Questionnaire

Variable	Question items	Cronbach's Alpha
Digital Resources	4	0.859
Employee Skills	4	0.876
Top Management	4	0.882
Technological Innovation	4	0.878
Employee Training & Development	4	0.830
Working Environment	4	0.845
Job Performance	4	0.850
Work-life Balance	4	0.827

As can be seen from the reliability test results in Table 3.4, the Cronbach's Alpha coefficients for all dimensions are greater than 0.80, indicating that the scale has high internal consistency. Among them, the Cronbach's Alpha coefficient for the top management dimension is the highest at 0.882, indicating extremely high consistency and reliability of the items in this dimension. The Cronbach's Alpha coefficients for the employee skills and technological innovation dimensions are 0.876 and 0.878, respectively, also showing very high reliability. Other dimensions, such as digital resources (0.859), employee training and development (0.830), working environment (0.845), job performance (0.850), and work-life balance (0.827), also exceed 0.80, indicating that the items in these dimensions have good internal consistency and reliability.

In summary, the Cronbach's Alpha coefficients for all dimensions exceed 0.80, indicating that the scales used in this study have high reliability, providing a reliable measurement tool for subsequent validity and data analysis.

3.6.2 Validity Analysis

In this study, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were used to assess the validity of the questionnaire. The KMO value ranges from 0 to 1, with values closer to 1 indicating that the sample data is more suitable for factor analysis. Generally, a KMO value greater than 0.7 is considered appropriate.

Bartlett's Test of Sphericity tests whether the correlations between variables are suitable for factor analysis. When the test result is significant (p-value less than 0.05), it indicates that factor analysis is appropriate. These methods ensure the structural validity of the scale, making the research results more reliable and valid. The analysis results are shown in Table 3.5.

Table 3.5 Validity Test of Questionnaire

Dimension	KMO Statistic Value	Bartlett's Test of Sphericity (Approx. Chi-Square)	df	Sig.
Digital Resources	0.829	705.953	6	0.000
Employee Skills	0.837	800.183	6	0.000
Top Management	0.840	841.737	6	0.000
Technological Innovation	0.833	818.456	6	0.000
Employee Training & Development	0.809	587.283	6	0.000
Working Environment	0.822	638.549	6	0.000
Job Performance	0.822	661.897	6	0.000
Work-life Balance	0.811	563.493	6	0.000

According to the results in Table 3.5, the KMO values for all research variables exceed 0.80, indicating that the sample data is suitable for factor analysis. The KMO value for the top management dimension is the highest at 0.840, suggesting that the data in this dimension is most suitable for factor analysis. Other dimensions, such as digital resources (0.829), employee skills (0.837), technological innovation (0.833), employee training and development (0.809), working environment (0.822), job performance (0.822), and work-life balance (0.811), also show high suitability.

Bartlett's Test of Sphericity results indicate that the tests for all dimensions are significant (p-values less than 0.001), further proving that the correlations between variables are suitable for factor analysis.

3.7 Data Analysis

The data analysis in this study involved multiple steps to ensure the reliability and validity of the research results. These steps included descriptive statistical analysis, correlation analysis, multiple regression analysis, and variance analysis. The following is a detailed description of each analysis method and its corresponding concepts.

3.7.1 Descriptive Statistical Analysis

Descriptive statistical analysis was used to summarize and describe the demographic characteristics of the sample, as well as the means and standard deviations of the research variables. By conducting a preliminary analysis of the data, the basic distribution and central tendency of the data can be understood. Specifically, descriptive statistical analysis includes calculating the frequency distribution, mean, standard

deviation, minimum, and maximum values of each variable. These statistics provide a deeper understanding of the overall characteristics of the sample and the basic shape of the data in the study.

3.7.2 Correlation Analysis

Correlation analysis was used to examine the linear relationship between the dimensions of digital transformation and the dimensions of employee job satisfaction. This study employed the Pearson correlation coefficient to measure the correlation between variables. The Pearson correlation coefficient ranges from -1 to 1, where:

A value closer to 1 indicates a strong positive correlation, meaning that an increase in one variable is associated with an increase in another variable.

A value closer to -1 indicates a strong negative correlation, meaning that an increase in one variable is associated with a decrease in another variable.

A value near 0 indicates no significant linear relationship. Through correlation analysis, the relationships between variables can be preliminarily understood, laying the foundation for subsequent regression analysis.

3.7.3 Multiple Regression Analysis

Multiple regression analysis is a statistical technique used to analyze the impact of multiple independent variables on a single dependent variable. This study used multiple regression analysis to quantify the specific impact of various dimensions of digital transformation on different aspects of employee job satisfaction. Regression analysis can reveal the independent influence of each independent variable on the dependent variable while controlling for the effects of other independent variables.

The basic formula for multiple regression analysis is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Y is the dependent variable (e.g., a dimension of employee job satisfaction such as employee training and development, working environment, job performance, or work-life balance).

β_0 is the intercept.

$\beta_1, \beta_2, \beta_3, \beta_4$ are the regression coefficients for the independent variables, representing the impact of each dimension of digital transformation (digital resources, employee skills, top management, and technological innovation) on the dependent variable.

X_1, X_2, X_3, X_4 are the independent variables.

e is the error term, representing the variation not explained by the model.

By employing these analytical methods, the study aims to provide empirical evidence on the relationships between various dimensions of digital transformation and different aspects of employee job satisfaction.

3.7.4 Variance Analysis

Variance Analysis (ANOVA) was used to explore the differences in job satisfaction by employee groups with different genders, ages, education levels, and departments. ANOVA can reveal whether there are significant differences in the means between different groups, thereby determining the characteristic differences by groups. This study employed one-way ANOVA and multifactor ANOVA to examine the impact of different demographic variables on employee job satisfaction.



Chapter 4 Findings

4.1 Introduction

This chapter presents the research findings, focusing on the statistical results derived from the survey data, including descriptive statistical analysis, correlation analysis, regression analysis, and variance analysis. The research population consisted of 10,000 employees from Chongqing Changan Automobile Manufacturing Enterprise. The minimum sample size was determined to be 385 using the Yamane formula, but to ensure the accuracy and validity of the sample data, the final number of valid questionnaires was increased to 406. The results reveal how various dimensions of digital transformation impact different aspects of employee job satisfaction and highlight significant differences among different employee groups. These findings provide a basis for the theoretical and practical discussions in the next chapter.

4.2 Descriptive Statistical Analysis

In the descriptive statistical analysis, this study provided a detailed description of the sample data, including the basic distribution of demographic characteristics and the mean and standard deviation analysis of each research variable. These descriptive statistics lay the foundation for subsequent data analysis and result interpretation.

4.2.1 Descriptive statistical analysis of demographic characteristics

Table 4.1 Descriptive Statistical Analysis of Demographic Characteristics

Attitude	classification indicators	Frequency	Percent
Gender	Male	207	51.0
	Female	199	49.0
Age	Under 20 years old	54	13.3
	21-30 years old	105	25.9
	31-40 years old	168	41.4
	Over 41 years old	56	13.8
Education	Associate degree or below	141	34.7
	Bachelor's degree	193	47.5
	Master's degree or above	72	17.7
Job Position	Senior Management	13	3.2
	Middle Management	99	24.4
	General Staff	294	72.4
Department	Front Office	42	10.3
	Production Process	132	32.5
	Supply Chain	95	23.4
	Entire HR, Finance, and Materials Departments	79	19.5
	Entire Business Operations	58	14.3

In the gender distribution of the sample in Table 4.1, males account for 51.0%, and females make up 49.0%, showing an almost equal distribution. The age of the respondents is primarily concentrated between 31-40 years (41.4%), followed by those aged 21-30 (25.9%), with a smaller proportion under 20 years (13.3%) and over 41 years (13.8%). Regarding educational background, most respondents hold a bachelor's degree (47.5%), while 34.7% have an associate degree or lower, and 17.7% possess a master's degree or higher. In terms of job positions, the majority are general staff (72.4%), with middle management making up 24.4%, and senior management only 3.2%. The departments where the respondents work are primarily in production processes (32.5%) and supply chain (23.4%), followed by human resources, finance, and materials departments (19.5%), business operations (14.3%), and front office (10.3%). Therefore, the respondents in this study are mainly employees aged 31-40 with a bachelor's degree, predominantly working in production processes and supply chain departments.

4.2.2 Descriptive statistical analysis of variables

Table 4.2 Descriptive Statistical Analysis of Variables

Variant	N	Mean	Std. Deviation
Digital Resources	406	14.56	1.07
Employee Skills	406	14.12	1.15
Top Management	406	14.01	1.18
Technological Innovation	406	14.58	1.12
Employee Training & Development	406	15.32	0.95
Working Environment	406	14.74	1.02
Job Performance	406	14.91	1.05
Work-life Balance	406	14.96	0.99

Based on the descriptive statistical analysis results in Table 4.2, the following observations can be made:

1) Digital Resources:

The mean value is 14.56 with a standard deviation of 1.07, indicating that most respondents have a positive and consistent evaluation of the company's digital resources. This suggests that the company's investment and management in digital resources are generally recognized by employees, but it may also reflect some disparities in the actual use and management of digital resources among employees. The company may need to further optimize resource allocation and management.

2) Employee Skills:

The mean value is 14.12 with a standard deviation of 1.15, showing that employees rate their digital skills relatively high, but there is some variation. Some employees may possess strong digital skills, while others have relatively lower skill levels. This indicates that the coverage and effectiveness of digital skills training may be uneven, necessitating more targeted training programs.

3) Top Management:

The mean value is 14.01 with a standard deviation of 1.18, indicating that respondents rate the performance of top management in digital transformation relatively high, but there is some individual variation. This suggests that while most employees recognize the performance of the management, some evaluations are inconsistent, possibly due to differences in contact and understanding of management across different departments or job position. The company needs to strengthen communication between top management and grassroots employees.

4) Technological Innovation:

The mean value is 14.58 with a standard deviation of 1.12, indicating that respondents rate the company's performance in technological innovation relatively high and consistently. This reflects that the company's efforts and achievements in technological innovation are recognized by employees, but continuous innovation is still needed to meet the evolving market and technological demands.

5) Employee Training & Development:

The mean value is 15.32 with a standard deviation of 0.95, showing high satisfaction among respondents with the company's efforts in employee training and development, and the evaluations are relatively consistent. This indicates that the company is doing very well in providing training and career development opportunities, and employees are highly satisfied with these opportunities. However, the company should continue to diversify training content and methods to meet the needs of different employees.

6) Working Environment:

The mean value is 14.74 with a standard deviation of 1.02, indicating that respondents rate the improvement in the working environment due to digital transformation highly, with relatively consistent evaluations. This shows that the company's digital transformation has positively impacted the working environment, but there is still a need to focus on continuous improvement and maintenance of the work environment.

7) Job Performance:

The mean value is 14.91 with a standard deviation of 1.05, indicating that respondents have a positive attitude towards the improvement in job performance due to digital transformation, with high consistency in evaluations. This suggests that digital transformation has significantly improved employees' job performance, but the company should continue to optimize work processes and performance evaluation standards to further enhance efficiency and employee satisfaction.

8) Work-life Balance:

The mean value is 14.96 with a standard deviation of 0.99, showing high satisfaction among respondents with the company's measures for work-life balance, with relatively consistent evaluations. This indicates that the company is doing well in helping employees balance work and life, and employees generally recognize this. However, the company should still focus on the individual needs of different employees and provide more flexible and personalized support measures.

In summary, the descriptive statistical analysis shows that the evaluations of various variables among employees are generally high, and the overall evaluations are consistent. These results reflect the positive outcomes achieved by the company in the process of digital transformation but also reveal areas for improvement in resource management, skill training, management communication, continuous innovation, diversified training content, work environment improvement, performance optimization, and personalized support for work-life balance. This provides foundational data for further in-depth analysis and verifies the effectiveness of digital transformation in enhancing employee job satisfaction. Through these analyses, the company can better understand employees' needs and feedback, and formulate more effective management and development strategies.

4.3 Variance Analysis

This section analyzes the differences in employee job satisfaction by different employee groups in the context of digital transformation, such as whether there are significant differences in job satisfaction variables based on gender, age, education level, job position and department. This tested the hypotheses H2 and its various dimensions in this study. To standardize the difference testing methods, ANOVA (Analysis of Variance) was used for all independent variables. The research results are shown in Table 4.3:

Table 4.3 Differential Analysis of Job Satisfaction by Different Employee Groups

	Employee Training & Development		Working environment		Job performance		Work-life balance	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Gender	1.465	0.115	0.635	0.856	1.163	0.296	0.741	0.752
Age	1.217	0.255	0.627	0.862	0.914	0.553	1.335	0.172
Education	1.571	0.079	1.303	0.192	1.515	0.091	1.894	0.020
Job Position	1.284	0.209	0.806	0.679	1.165	0.293	1.734	0.039
Department	1.130	0.327	1.498	0.097	0.991	0.466	1.251	0.226

According to the analysis results in Table 4.3, education level and job position have significant effects on the differences in work-life balance. The F-value for education level is 1.894, with a Sig. value of 0.020, and the F-value for job position is 1.734, with a Sig. value of 0.039. This indicates that there are significant differences in work-life balance satisfaction among employees with different education levels and job

positions. Employees with higher education levels may possess better time management skills, and the differences in work intensity and responsibilities among various job positions could also lead to differences in work-life balance satisfaction.

On the other hand, gender, age, and department do not show significant differences in any dimensions of job satisfaction (all Sig. values are greater than 0.05). This might be due to the increasing equality in work conditions and opportunities for different genders in modern enterprises. Employees of various ages receive appropriate training and support during the digital transformation process, resulting in no significant differences in job satisfaction. Similarly, employees across different departments receive the same resources and support during the digital transformation, reducing departmental disparities. This suggests that while promoting digital transformation, enterprises should particularly address the needs of employees with different education levels and job positions, while maintaining equal training and support to enhance overall job satisfaction.

4.4 Inferential Statistical Analysis

4.4.1 Correlation Analysis

To further explore the relationships between the dimensions of digital transformation and the various aspects of employee job satisfaction, this study employed Pearson correlation coefficients to analyze the linear relationships and their strengths between variables. This analysis provides a foundation for subsequent regression analysis and causal relationship research. The primary objective of the correlation analysis is to determine the strength and direction of the relationships between the dimensions of digital transformation (such as Digital Resources, Employee Skills, Top Management, and Technological Innovation) and the dimensions of employee job satisfaction (such as Employee Training & Development, Working Environment, Job Performance, and Work-Life Balance). Understanding these relationships can reveal which aspects of digital transformation have the most significant impact on employee job satisfaction, thereby providing a basis for developing relevant management strategies. The Pearson correlation coefficient (ranging from -1 to 1) was used to measure the linear relationships between variables. A value closer to 1 indicates a stronger positive correlation, a value closer to -1 indicates a stronger negative correlation, and a value near 0 indicates no significant linear relationship.

Table 4.4 Correlation Analysis between Variables

		Employee Training & Development	Working environment	Job performance	Work-life balance
Digital resources	Pearson	0.288**	0.284**	0.436**	0.295**
	Sig.	0.000	0.000	0.000	0.000
Employee skills	Pearson	0.348**	0.286**	0.420**	0.302**
	Sig.	0.000	0.000	0.000	0.000
Top management	Pearson	0.399**	0.309**	0.414**	0.358**

	Sig.	0.000	0.000	0.000	0.000
Technological innovation	Pearson	0.314**	0.277**	0.360**	0.304**
	Sig.	0.000	0.000	0.000	0.000

** . At the 0.01 level (two-tailed), the correlation is significant

Based on the correlation coefficients between the research variables presented in Table 4.4, it can be observed that all correlations are significant at the 0.01 level (two-tailed). Digital resources are significantly positively correlated with employee training and development ($r = 0.288$), working environment ($r = 0.284$), job performance ($r = 0.436$), and work-life balance ($r = 0.295$). The correlations between employee skills and these variables are $r = 0.348$, $r = 0.286$, $r = 0.420$, and $r = 0.302$, respectively. The correlations between top management and these variables are $r = 0.399$, $r = 0.309$, $r = 0.414$, and $r = 0.358$, respectively. The correlations between technological innovation and these variables are $r = 0.314$, $r = 0.277$, $r = 0.360$, and $r = 0.304$, respectively. This indicates that digital resources, employee skills, top management, and technological innovation all have significant positive impacts on employee training and development, working environment, work-life balance, and job performance.

4.4.2 Regression Analysis

This section further explores the specific impacts of various dimensions of digital transformation on different aspects of employee job satisfaction using regression analysis. Regression analysis helps quantify the relationships between variables, determining the causal relationships between the dependent variable (employee job satisfaction) and the independent variables (dimensions of digital transformation). This study employs multiple regression analysis, taking the four dimensions of digital transformation (digital resources, employee skills, top management, and technological innovation) as independent variables, and the four dimensions of employee job satisfaction (employee training and development, working environment, job performance, and work-life balance) as dependent variables. By establishing regression models, the study analyzes the extent and significance of the impact of each independent variable on the dependent variables.

Multiple regression analysis is a statistical technique used to analyze the effect of multiple independent variables on a single dependent variable. It can determine the independent impact of each variable while controlling for the effects of other variables. This method reveals complex relationship patterns, aiding in a more accurate understanding of the variations in the dependent variable.

Table 4.5 Regression Analysis of the Impact of Digital Transformation and Employee Job Satisfaction

	Model 1	Model 2	Model 3	Model 4
Gender	0.052	-0.032	0.076	0.004
Age	0.035	0.043	0.007	-0.008
Education	0.023	0.021	0.029	0.039
Job position	0.032	-0.003	-0.041	-0.067

Department	0.088	0.065	0.031	0.097*
Digital resources	0.115*	0.151**	0.268**	0.135**
Employee skills	0.143**	0.125*	0.203**	0.102
Top management	0.228**	0.136*	0.157**	0.187**
Technological innovation	0.126*	0.120*	0.110*	0.131*
F value	13.288**	8.678**	21.756**	11.213**
R Square	0.232	0.165	0.331	0.203
Adjusted R Square	0.214	0.146	0.316	0.185
D-W	2.118	1.990	2.077	1.969

Model 1 (Dependent Variable: Employee Training & Development)

Model 2 (Dependent Variable: Working environment)

Model 3 (Dependent Variable: Job performance)

Model 4 (Dependent Variable: Work-life balance)

* level of significance 0.05

** level of significance 0.01

4.4.2 Regression Analysis

Through regression analysis, the specific impacts of various dimensions of digital transformation on different aspects of employee job satisfaction can be clarified. The main results of each regression model are as follows:

1) Model 1 (Employee Training & Development)

In Model 1, employee training and development is the dependent variable, while digital resources, employee skills, top management, and technological innovation are the independent variables. The regression analysis results are as follows:

Digital Resources: Regression coefficient = 0.115, significance level = 0.05 ($p < 0.05$), indicating that digital resources positively impact employee training and development.

Employee Skills: Regression coefficient = 0.143, significance level = 0.01 ($p < 0.01$), showing that the improvement of employee skills has a significant positive effect on employee training and development.

Top Management: Regression coefficient = 0.228, significance level = 0.01 ($p < 0.01$), indicating that the active involvement of top management significantly enhances employee training and development satisfaction.

Technological Innovation: Regression coefficient = 0.126, significance level = 0.05 ($p < 0.05$), showing that technological innovation has a significant positive impact on employee training and development.

The F value of the model is 13.288 ($p < 0.01$), R^2 is 0.232, and the adjusted R^2 is 0.214, indicating that 23.2% of the variance can be explained by these independent variables.

2) Model 2 (Working Environment)

In Model 2, working environment is the dependent variable, while digital resources, employee skills, top management, and technological innovation are the independent variables. The regression analysis results are as follows:

Digital Resources: Regression coefficient = 0.151, significance level = 0.01 ($p < 0.01$), indicating that the effective use of digital resources significantly improves the working environment.

Employee Skills: Regression coefficient = 0.125, significance level = 0.05 ($p < 0.05$), indicating that the improvement of employee skills has a significant positive effect on the working environment.

Top Management: Regression coefficient = 0.136, significance level = 0.05 ($p < 0.05$), indicating that top management positively impacts the working environment.

Technological Innovation: Regression coefficient = 0.120, significance level = 0.05 ($p < 0.05$), showing that technological innovation has a significant positive impact on the working environment.

The F value of the model is 8.678 ($p < 0.01$), R^2 is 0.165, and the adjusted R^2 is 0.146, indicating that 16.5% of the variance can be explained by these independent variables.

3) Model 3 (Job Performance)

In Model 3, job performance is the dependent variable, while digital resources, employee skills, top management, and technological innovation are the independent variables. The regression analysis results are as follows:

Digital Resources: Regression coefficient = 0.268, significance level = 0.01 ($p < 0.01$), indicating that the investment in digital resources significantly improves employee job performance.

Employee Skills: Regression coefficient = 0.203, significance level = 0.01 ($p < 0.01$), showing that employee skills have a significant positive impact on job performance.

Top Management: Regression coefficient = 0.157, significance level = 0.01 ($p < 0.01$), indicating that top management has a significant positive impact on job performance.

Technological Innovation: Regression coefficient = 0.110, significance level = 0.05 ($p < 0.05$), showing that technological innovation has a significant positive impact on job performance.

The F value of the model is 21.756 ($p < 0.01$), R^2 is 0.331, and the adjusted R^2 is 0.316, indicating that 33.1% of the variance can be explained by these independent variables.

4) Model 4 (Work-life Balance)

In Model 4, work-life balance is the dependent variable, while digital resources, employee skills, top management, and technological innovation are the independent variables. The regression analysis results are as follows:

Digital Resources: Regression coefficient = 0.135, significance level = 0.01 ($p < 0.01$), indicating that the utilization of digital resources significantly improves employees' work-life balance.

Top Management: Regression coefficient = 0.187, significance level = 0.01 ($p < 0.01$), showing that the active participation of top management helps employees better balance work and life.

Technological Innovation: Regression coefficient = 0.131, significance level = 0.05 ($p < 0.05$), indicating that technological innovation has a significant positive impact on work-life balance.

Department: Regression coefficient = 0.097, significance level = 0.05 ($p < 0.05$), indicating that there are significant differences in work-life balance satisfaction by different departments, which needs attention.

The F value of the model is 11.213 ($p < 0.01$), R^2 is 0.203, and the adjusted R^2 is 0.185, indicating that 20.3% of the variance can be explained by these independent variables.

In summary, the determination coefficients (R^2) of each regression model range from 0.165 to 0.331, indicating a certain level of explanatory power. The regression analysis results show that various dimensions of digital transformation have significant impacts on different aspects of employee job satisfaction. These results further validate the findings of the correlation analysis and provide quantitative evidence that, in the

process of promoting digital transformation, companies should focus on the investment in digital resources, the enhancement of employee skills, the participation of top management, and technological innovation to comprehensively improve employee job satisfaction. Through these specific strategies, companies can better drive digital transformation, improving overall performance and employee satisfaction.



Chapter 5 Conclusion and Recommendation

5.1 Introduction

In previous chapters, the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Manufacturing Enterprise was analyzed. This chapter summarizes the findings, discusses their implications, and offers practical recommendations. The focus is on how digital transformation affects employee training and development, working environment, job performance, and work-life balance, along with the influence of demographic characteristics, namely, gender, age, education level, and job position on job satisfaction. By integrating these findings with existing literature, this chapter provides valuable guidance for businesses undergoing digital transformation, helping to foster a more motivated and productive workforce.

5.1.1 Digital Transformation and Employee Job Satisfaction

This study analyzed the data collected in Chapter 4 and drew corresponding conclusions. In this study, digital transformation (digital resources, employee skills, top management, technological innovation) was used as the independent variable, and employee job satisfaction (employee training and development, working environment, job performance, work-life balance) as the dependent variable. Additionally, four demographic characteristics: gender, age, education level, job position and department were included in the model to construct a conceptual framework linking digital transformation to employee job satisfaction.

1) The Impact of Digital Transformation Variables on Employee Training and Development

The regression analysis of digital transformation variables and employee training and development revealed that digital resources, employee skills, top management, and technological innovation all have significant positive effects on employee training and development. The regression coefficients were 0.115*, 0.143**, 0.228**, and 0.126*, respectively, with p-values all less than 0.05 or 0.01. These results indicate that adequate digital resources, enhanced employee skills, active participation by top management, and continuous technological innovation significantly improve employee training and development satisfaction. This confirms research hypothesis H1a. It suggests that employees can better adapt to and promote digital transformation after receiving systematic training and development opportunities.

2) The Impact of Digital Transformation Variables on Working Environment

Digital transformation variables also have a positive impact on the working environment. The regression coefficients for digital resources, employee skills, top

management, and technological innovation were 0.151**, 0.125*, 0.136*, and 0.120*, respectively, with p-values all less than 0.05 or 0.01. These findings suggest that investments in digital resources and skills, along with supportive top management and continuous innovation, significantly improve the working environment. This confirms research hypothesis H1b. It indicates that digital transformation helps optimize work processes and increases employee satisfaction with the working environment.

3) The Impact of Digital Transformation Variables on Job Performance

The analysis showed that digital transformation significantly improves job performance. The regression coefficients for digital resources, employee skills, top management, and technological innovation were 0.268**, 0.203**, 0.157**, and 0.110*, respectively, with p-values all less than 0.05 or 0.01. These results highlight the important role of digital transformation in enhancing employee performance. This confirms research hypothesis H1c. It suggests that investments in digital resources and skill enhancement, as well as active participation by top management, significantly improve employee job performance.

4) The Impact of Digital Transformation Variables on Work-life Balance

Digital transformation variables also have a significant positive impact on work-life balance. The regression coefficients for digital resources, top management, and technological innovation were 0.135**, 0.187**, and 0.131*, respectively, with p-values all less than 0.05 or 0.01. These results indicate that the reasonable use of digital resources, active participation by top management, and continuous technological innovation significantly improve employees' work-life balance. This confirms research hypothesis H1d. It suggests that digital transformation can help employees balance work and life, thereby increasing their satisfaction.

In summary, the various dimensions of digital transformation have significant impacts on different aspects of employee job satisfaction. Through in-depth analysis of these data, we can more comprehensively understand the impact of digital transformation on employee job satisfaction, confirming the research hypotheses and providing scientific evidence for companies in promoting digital transformation. These findings lay a solid foundation for theoretical and practical discussions in the next section.

5.1.2 Demographic Characteristics and Employee Job Satisfaction

Using ANOVA (Analysis of Variance), this study explored the differences in employee job satisfaction across demographic characteristics (gender, age, education level, job position, and department). The results show that education level and job position significantly affect work-life balance. Specifically, the F value for education level is 1.894, with a significance level of 0.020 ($p < 0.05$), and the F value for job

position is 1.734, with a significance level of 0.039 ($p < 0.05$). This indicates that employees with different education levels and job positions have significant differences in their work-life balance satisfaction. Employees with higher education levels may have better time management skills and resource acquisition capabilities, while differences in job intensity and responsibility across job positions also lead to different levels of work-life balance satisfaction. Therefore, research hypotheses H2b and H2c are supported, indicating that education level and job position significantly influence employees' work-life balance satisfaction.

However, gender, age, and department do not show significant differences in any dimensions of job satisfaction (p-values are all greater than 0.05), suggesting that these personal trait variables have little impact on employee job satisfaction. This might be because gender equality in work conditions and opportunities has gradually been achieved in modern enterprises, and employees of different ages receive corresponding training and support during digital transformation, resulting in no significant differences in job satisfaction. Similarly, employees across departments receive the same resources and support during digital transformation, reducing inter-departmental differences. Therefore, research hypotheses H2a, H2d, and H2e are not supported, indicating that gender, age, and department do not significantly impact employee job satisfaction.

In conclusion, the impact of demographic characteristics on employee job satisfaction shows certain differences. Education level and job position significantly affect work-life balance, while gender, age, and department have little impact on various dimensions of job satisfaction. These findings not only validate some of the research hypotheses but also provide reference points for companies to develop targeted strategies during digital transformation, further emphasizing the importance of considering education and job position differences in employee job satisfaction. Through these analyses, companies can better understand and meet the needs of different employee groups, enhancing overall job satisfaction.

5.2 Discussion

5.2.1 Digital Transformation and Employee Training and Development

Digital transformation has played a positive role in promoting employee training and development. This study found a significant positive correlation between digital resources and employee training and development, consistent with the findings of Vial (2019) and Westerman et al. (2014), who emphasized the importance of digital resources in enhancing employee skills and career development. By introducing new digital technologies and tools, companies can provide more flexible and efficient training programs, helping employees continuously improve their professional skills and knowledge.

Noe (2008) pointed out that systematic training programs significantly improve employee professional skills and satisfaction, a view supported by the results of this study. Through digital training platforms, employees can access the latest knowledge and skills anytime, anywhere, enhancing their self-actualization needs and thus increasing job satisfaction. Additionally, the literature mentions that personalized development plans allow employees to clearly define and strive for their career goals, further strengthening their cognitive engagement (Zhang, 2012; Li & Yu, 2022). In this regard, the findings of this study align closely with the existing literature, verifying the critical role of digital transformation in employee training and development.

5.2.2 Digital Transformation and Working Environment

Digital transformation has significantly improved the working environment by optimizing work processes and providing advanced work equipment, enhancing employees' working conditions and safety. Support from top management and technological innovation have played essential roles in improving the working environment, consistent with the findings of Raziq and Maulabakhsh (2015), who noted that a good working environment can reduce employee stress and anxiety and increase job satisfaction.

Buchwald and Urbach (2020) pointed out in their study that if companies ignore the adaptation process of employees when promoting digital transformation, it can lead to decreased job satisfaction. However, this study found that by addressing employee needs and providing appropriate support, companies can significantly enhance employees' satisfaction with the working environment, meeting their safety needs. By introducing project management software and collaboration platforms, companies can facilitate cross-departmental cooperation, improving work process transparency and efficiency, further validating the positive impact of digital transformation on the working environment.

5.2.3 Digital Transformation and Job Performance

Digital transformation also shows positive effects on improving job performance. By introducing technologies such as big data and artificial intelligence, companies can optimize work processes, improving employee work efficiency and quality. Malkanthi and Ali (2016) found that digital transformation significantly enhances employee productivity, consistent with this study's results.

Chen et al. (2021) indicated that the application of digital technologies not only increases productivity but also enhances employee job satisfaction. The study results show that technological innovation has a significant positive impact on job performance, and active participation and support from top management can effectively enhance job performance. These findings further verify the importance of esteem needs on job performance (Locke, 1976). Through transparent decision-making and effective

communication by top management, employees feel more supported and recognized in their work, thereby increasing their work motivation and performance.

5.2.4 Digital Transformation and Work-life Balance

Digital transformation has also shown significant effects in improving work-life balance. Through flexible work arrangements and advanced communication technologies, companies can help employees better balance work and life, thereby enhancing their satisfaction. The research by Brough et al. (2020) indicated that work-life balance has an important impact on overall employee satisfaction, which is consistent with this study's results.

Riza et al. (2018) pointed out that digital transformation plays a crucial role in helping employees balance work and life, meeting their physiological and social needs. This study found significant positive correlations between technological innovation and top management support and work-life balance. By providing flexible working hours and remote work opportunities, companies can help employees better manage work and family responsibilities, thus improving their overall satisfaction. This finding is also supported by Sun (2020), who noted that digital communication tools significantly enhance team interaction and trust among employees, positively affecting work-life balance.

5.2.5 Demographic Characteristics and Employee Job Satisfaction

Regarding the impact of demographic characteristics on employee job satisfaction, ANOVA analysis showed significant differences in job satisfaction among employees with different genders, ages, education levels, job position and departments. First, gender and age did not significantly affect job satisfaction, indicating that employees of different genders and ages had similar perceptions of job satisfaction during the digital transformation process (Spector, 1997).

However, education level significantly impacted work-life balance. Employees with higher education levels showed higher satisfaction with balancing work and life, possibly due to better time management skills and work flexibility (Raziq & Maulabakhsh, 2015). ANOVA results showed that the F value for education level on work-life balance was 1.894, with a significance level of 0.020, validating this point.

Regarding job position, ANOVA analysis indicated that job position significantly affected work-life balance, with an F value of 1.734 and a significance level of 0.039. Higher-level managers may exhibit higher satisfaction with work-life balance, possibly due to greater autonomy and resources (Brough et al., 2020). The impact of departments on the working environment also showed some significance, with an F value of 1.498 and a significance level of 0.097, suggesting differences in job satisfaction related to the working environment across departments.

In conclusion, demographic characteristics have multifaceted impacts on employee job satisfaction, with education level and job position significantly influencing work-life balance. By analyzing these factors, companies can develop more personalized and targeted management strategies to improve overall job satisfaction. Understanding the needs and perceptions of different employee groups can help companies provide more targeted support and resources during digital transformation, further enhancing employee satisfaction and organizational performance (Buchwald & Urbach, 2020).

5.3 Recommendation

Based on the analysis of the impact of digital transformation on employee job satisfaction, this study offers several valuable conclusions. To help enterprises enhance employee job satisfaction during the digital transformation process, the following recommendations are proposed:

1. Improve the Efficiency of Digital Resource Utilization

This study demonstrates that digital resources have a significant positive impact on employee training and development, working environment, job performance, and work-life balance (Vial, 2019; Westerman et al., 2014). Therefore, companies should increase investment in digital resources to ensure that employees can access the latest technical knowledge and industry information at any time. Specific measures include establishing a unified digital resource platform for centralized management of various digital resources, enabling employees to conveniently access and utilize these resources; regularly updating and maintaining digital resources to ensure their relevance and usefulness, avoiding outdated or invalid information; and providing training on the use of digital resources to help employees become familiar with and master these tools, thereby improving their work efficiency and satisfaction.

2. Enhance Employee Skills Training

Improving employee skills is a key factor for the success of digital transformation (Noe, 2008). Companies should prioritize digital skills training for employees through systematic training programs and online learning platforms to continuously enhance their professional knowledge and skills. Specific measures include conducting regular training projects, developing and implementing systematic training plans based on employees' career goals and skill needs to help them improve their professional skills; establishing online learning platforms to provide flexible learning opportunities, allowing employees to enhance themselves anytime, anywhere; and implementing personalized development plans tailored to employees' personal characteristics and career goals to increase their job satisfaction and intrinsic motivation.

3. Strengthen Top Management Support

Top management plays a crucial role in the digital transformation process (Buchwald & Urbach, 2020). The study results indicate that top management

significantly influences employee training and development, working environment, job performance, and work-life balance. Specific measures include maintaining transparent decision-making processes, ensuring that employees understand and comprehend the company's strategic goals and implementation plans; enhancing communication channels by establishing effective communication mechanisms to ensure top management is aware of employees' needs and feedback and can make appropriate adjustments; and providing necessary support and resources, with top management actively participating in the digital transformation process to facilitate a smooth transition for employees.

4. Promote Technological Innovation

Technological innovation is a vital driving force for digital transformation (Chen et al., 2021). Companies should continually promote technological innovation by introducing advanced technologies and optimizing work processes to improve employee work efficiency and quality. Specific measures include investing in advanced technologies, such as big data and artificial intelligence, to optimize work processes and increase production efficiency; fostering an innovation culture to stimulate employees' creativity and enthusiasm; and providing flexible work arrangements through technological innovation, such as flexible working hours and remote work opportunities, to help employees better balance work and life.

5. Value Employees' Personal Traits

The study results show that education level and job position significantly impact work-life balance (Raziq & Maulabakhsh, 2015; Brough et al., 2020). Companies should develop more personalized and targeted management strategies based on employees' personal traits. Specific measures include offering more career development opportunities and challenging work for highly educated employees while providing more foundational training and support for employees with lower education levels; providing more autonomy and resources for senior management to help them achieve work-life balance; and implementing differentiated management across departments by providing specific support and resources tailored to the unique needs of each department to improve overall job satisfaction.

6. Regularly Evaluate and Adjust Strategies

Companies should regularly evaluate employee job satisfaction during the digital transformation process to promptly identify and address any issues. Specific measures include conducting regular satisfaction surveys through questionnaires and interviews to understand employees' job satisfaction levels; analyzing survey results to identify the main factors affecting job satisfaction and developing corresponding improvement measures; and continuously optimizing and adjusting digital transformation strategies based on evaluation results to ensure their effectiveness and sustainability. These recommendations aim to guide companies in enhancing employee job satisfaction

during digital transformation, thereby achieving sustainable development and overall performance improvement.

5.4 Further Study

This study quantitatively analyzed the impact of digital transformation on employee job satisfaction in manufacturing enterprises. The results show that digital transformation has a significant positive impact on enhancing employee training and development, working environment, job performance, and work-life balance. Future research could expand the sample scope to different regions and industries to verify the generalizability and differences of the results. Combining qualitative research methods, such as in-depth interviews and case studies, could provide a deeper understanding and allow for the observation of the long-term effects of digital transformation through longitudinal studies.

Additionally, future research should explore the differences in responses to digital transformation among employees with different characteristics, focusing on other personal traits such as years of work experience and cultural background. It should also examine the mediating roles of variables like psychological capital and perceived organizational support in the relationship between digital transformation and employee job satisfaction. Research can further refine specific implementation strategies for digital transformation, investigating the specific effects of different training methods and management support approaches on employee job satisfaction.

Lastly, future research could extend to exploring the overall impact of digital transformation on organizational performance, evaluating its comprehensive effects on productivity, innovation capability, and market competitiveness. By expanding the research scope, adopting a mixed-method approach, and analyzing specific implementation strategies and pathways, future research will provide more comprehensive and in-depth guidance for enterprises in the digital transformation process. It is hoped that the conclusions and recommendations of this study will provide useful references for subsequent research.

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Appendix

Dear Participant,

Thank you for taking part in this survey. This study aims to explore the impact of digital transformation on employee job satisfaction at Chongqing Changan Automobile Co., Ltd. The survey is anonymous, and all data will be used solely for academic research. Your personal information and responses will be kept strictly confidential. The questionnaire covers aspects such as digital resources, employee skills, top management, technological innovation, employee training and development, working environment, job performance, and work-life balance. It is expected to take 5-10 minutes to complete.

Your honest thoughts and opinions are crucial to this research, so please answer based on your actual situation. We greatly appreciate your valuable time and participation in this survey. Wishing you a pleasant day.

ZONGNAN LI

Part I: Basic personal information (please tick the appropriate box)

1. Your gender:

- Male
- Female

2. Your age:

- 21-25 years old
- 26-30 years old
- 31-35 years old
- 36-40 years old
- Over 41 years old

3. Your highest education level:

- College and below
- Bachelor's
- Master's and above

4. Your Job:

- Senior Management
- Middle Management
- General Staff

5. Your Department:

- Front Office
- Production Process
- Supply Chain
- Human Resources, Finance, and Materials Department
- Business Operations

Part I: Likert Level 5 Scale

Please choose the option that you think most agree with according to the actual situation. (1=very dissatisfied, 2=somewhat dissatisfied, 3=basically satisfied, 4=somewhat satisfied, 5=very satisfied)

Table A-1 Digital Transformation Measurement Scale

Digital Resources (DR)	1	2	3	4	5
DR1. The company has sufficient resources to ensure the implementation of the digital transformation strategy.					
DR2. The company can quickly obtain production information and other resources through various digital channels.					
DR3. The company can effectively avoid big data pitfalls and extract useful data information.					
DR4. The company has a professional digital resource management team.					
Employee Skills (ES)	1	2	3	4	5
ES1. The company has a large number of digital professionals.					
ES2. The company places great emphasis on employees' digital capabilities.					
ES3. Employees' digital skills have created higher performance for the team.					
ES4. Employees are proficient in using various data algorithms to analyze and mine data information.					
Top Management (TM)	1	2	3	4	5
TM1. Top executives are transparent in formulating and implementing digital transformation strategies.					
TM2. Top executives can usually provide various facilities, such as digital equipment and appropriate software, to support the development of digital transformation.					
TM3. Top executives can effectively coordinate conflicts and disputes between different departments during digital transformation.					
TM4. Top executives have a positive attitude towards building and managing a digital environment or culture.					
Technological Innovation (TI)	1	2	3	4	5
TI1. The current technological innovation capabilities of the company provide a solid foundation for digital transformation.					
TI2. The company's technological innovation planning is closely integrated with the development of digital transformation.					
TI3. Technological innovation has accelerated the company's digital process.					
TI4. Technological innovation provides more development directions for the company's digital transformation.					

Table A-2 Employee Job Satisfaction Measurement Scale

Employee Training & Development (ETD)	1	2	3	4	5
ETD1. The company has clear goals for developing employees' digital capabilities.					
ETD2. The company provides sufficient professional digital skills training for employees.					
ETD3. Employees can well apply the new skills/knowledge they have acquired to actual work.					
ETD4. The company can create better career paths or more career development opportunities for employees.					
Working Environment (WE)	1	2	3	4	5
WE1. The company's digital transformation has provided better work equipment for employees.					
WE2. Digital facilities have improved workers' safety at work.					
WE3. Employees' work processes have been better optimized.					
WE4. Changes in work environment and modes have positively influenced the coordination between employees.					
Job Performance (JP)	1	2	3	4	5
JP1. The standards for employee performance evaluation have become more reasonable and standardized.					
JP2. Employees can easily complete tasks that were previously difficult.					
JP3. The company can better match work with employees' talents.					
JP4. Each link in the work process is more transparent, making it easier for employees to handle emergencies.					
Work-life Balance (WB)	1	2	3	4	5
WB1. Employees can manage their time more effectively to handle various work-related issues.					
WB2. Employees have enough time to handle personal life issues.					
WB3. With family support, employees are more likely to focus on work.					
WB4. The company shows its care for employees' work-life balance through family benefits (e.g., New Year gifts, movie tickets) to help them balance work and family time.					