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# Analysis of Digital Transformation Path of Service Industry

**Jiayu Zhang**[1, *]

[1]LONGRE, Shanghai, China
*Corresponding author:
zhang21696950@gmail.com

**Abstract:**

This paper employs research methods such as literature analysis and comparative data analysis to explore primary pathways and safeguarding measures for digital transformation in the service sector. Through comparative analysis of three digital transformation pathways in the food delivery logistics industry—technological empowerment, process reengineering, and organizational-talent alignment—and by examining digital transformation in education and healthcare services, it reveals distinct characteristics of digital transformation. Education emphasizes the development of "online education + offline education," while healthcare emphasizes the implementation path of "telemedicine + data-driven management." The study also examines three support channels for safeguarding service sector digital transformation: government-level top-down policy design, enterprise-level leadership enhancement and talent cultivation, and industry-level standardization and collaboration. The findings encompass technological pathways and differentiate transformation approaches, institutional frameworks, and talent support systems. Technological advancement and organizational transformation mutually reinforce each other, necessitating distinct pathways for varying sector characteristics. Robust institutional frameworks and specialized talent development emerge as critical enablers for service sector digital transformation. The study concludes with three key findings and proposes corresponding recommendations.

**Keywords:** Digital transformation; service industry; technology.

## 1. Introduction

In recent years, "digital transformation" has emerged as a pivotal trend in the development of the service industry. By leveraging technologies such as the internet, big data, and artificial intelligence, digital transformation reshapes traditional business processes to enhance customer experience and operational

efficiency. Research indicates that digital transformation constitutes the process of upgrading existing business workflows and customer experiences through digital technologies [1]. Within the service sector, both governments and enterprises widely recognize that advancing digital empowerment will drive high-quality development. Lifestyle services are a key sector for stimulating consumption, improving people's livelihoods, and creating employment. Digitalization should be leveraged to drive the upgrading of these services. The COVID-19 pandemic has further highlighted the importance of digitalization, forcing many industries to migrate from offline to services online. Therefore, it is necessary to conduct an in-depth analysis of digital transformation pathways across different service sectors and formulate effective implementation strategies. To this end, this paper will systematically explore methods and safeguards for digital transformation in the service sector. It will draw on recent academic literature and policy documents, using case studies from three sectors: food delivery logistics, education, and healthcare.

## 2. Core Pathways for Digital Transformation in the Service Industry

In service sectors such as food delivery logistics, digital transformation is primarily advanced through three pathways: technological empowerment, process restructuring, and organizational and talent alignment.

### 2.1 Technology Empowerment Pathways

First, technological innovation is an indispensable driving force in the development of logistics enterprises. Research indicates that logistics service providers can significantly enhance operational efficiency, optimize delivery routes, and improve supply chain visibility by applying technologies such as big data analytics, Internet of Things (IoT) devices, AI-driven route optimization, and blockchain [2,3]. For instance, IoT sensors enable real-time monitoring of vehicles or packages, AI technology intelligently plans optimal delivery routes during peak periods, and big data analytics provide better support for demand forecasting and order fulfillment. Additionally, national policies emphasize improving smart logistics infrastructure. The Guiding Opinions explicitly support the development of facilities like automated warehouses, sorting robots, autonomous delivery vehicles, drones, and smart pickup lockers. By deploying smart hardware and integrating new technologies, these initiatives provide hardware support for the entire delivery chain. Such technological empowerment enables food delivery companies to transition from reliance on manual labor to intelligent operations, ultimately delivering faster and more precise services to end users [4]. On one hand, Meituan and Ele.me are transforming traditional delivery systems through big data, cloud computing, and artificial intelligence. For instance, Meituan actively develops autonomous delivery technologies, introducing automated delivery vehicles and drones during the pandemic. Statistics show that from April to May 2022, Meituan's autonomous delivery vehicles completed approximately 703,000 food delivery orders [5]. Drone delivery has also significantly boosted efficiency in remote areas. Simultaneously, intelligent algorithms play a pivotal role in route optimization. Ele.me's smart dispatch system processes thousands of data points in parallel—including merchant preparation times, rider locations, traffic conditions, and weather—to calculate optimal delivery routes. It continuously learns from each delivery, progressively reducing average delivery times [6]. Simultaneously, machine learning powers personalized recommendations and demand forecasting: by analyzing user history, time, and weather, it suggests popular merchants and dishes to boost order rates. Mobile payments and the sharing economy further drive technological advancement. After securing $1.25 billion from Alibaba, Ele.me integrated Alipay into its platform, eliminating online payment barriers [6]. Meituan built a massive real-time monitoring and analytics platform through in-house development and third-party integration, enabling live order tracking, delivery monitoring, and customer feedback display. In summary, these cutting-edge technologies have digitized food delivery services, significantly boosting delivery speed and operational efficiency.

### 2.2 Process Reengineering Pathways

The introduction of technology often comes with process reengineering. Food delivery platforms integrate processes such as online ordering, merchant meal preparation, and delivery dispatch, achieving efficiency upgrades. For instance, the platform-based operational model digitizes order collection, warehouse inventory management, and delivery scheduling, connecting all nodes of the supply chain. Restaurants and delivery teams communicate instantly through a shared system, reducing intermediate steps and information delays. This digital process restructuring not only optimizes resource utilization but also minimizes human error and enhances efficiency. Government documents also advocate for enhancing the digitalization of commerce and services, encouraging traditional restaurants to undergo intelligent upgrades to provide faster responses and better service to customers. By reshaping business processes, food delivery companies can achieve integrated online-offline operations, improving service efficiency and user experience. Take Meituan as an example: it has integrated warehousing, sorting, and delivery to build a "front-end warehouse + community station" model. Specifically, Meituan establishes micro-warehouses near residential areas, each span-

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ning just 50–200 square meters. These facilities process orders approximately seven times faster than traditional warehouses and reduce sorting costs by 50% per order from the previous 1.5 yuan [5]. Residents can place orders online and choose either pickup at nearby community service stations or doorstep delivery by dedicated Meituan riders, drastically shortening the "last-mile" delivery time [5]. This integrated "warehouse-station-delivery" process advances distribution nodes and compresses workflows, significantly enhancing timeliness and user experience. In terms of business models, Ele.me is also diversifying and evolving toward a platform-based approach. Beyond food ordering and delivery, it has expanded into on-demand retail and pharmaceutical delivery, forming a closed-loop ecosystem. Ele.me provides restaurants with supply chain finance and operational consulting services, optimizing inventory levels and menu offerings through digital analysis of merchant operational data [6]. Additionally, Ele.me has built its own delivery fleet ("self-built team"), enhancing control over the delivery process [6]. This means the platform has strengthened its ability to manage delivery resources and quality, shifting from complete reliance on third parties to partial internalization and autonomy. In summary, through restructuring its logistics system and digitizing value-added services, the food delivery platform has achieved process optimization and innovation.

### 2.3 Pathways for Organizational-Talent Alignment

Beyond technological and process transformation, digital transformation also requires corresponding organizational restructuring and talent development. PwC points out that enterprises in the digital era face complex management and transformation challenges, necessitating simultaneous shifts in organizational and talent management mechanisms. This involves breaking away from traditional human resources thinking and introducing new role definitions and competency standards [7]. In the food delivery logistics sector, this means companies must establish cross-departmental collaborative teams. These teams should include roles in technology R&D and data analysis, as well as versatile professionals responsible for business and market operations. Concurrently, enhanced digital training for frontline delivery personnel is essential. Leadership must formulate digital strategies and foster an innovative-driven culture, enabling employees to swiftly adapt to new technologies and processes. Another core element of digital transformation in the service industry lies in adjusting organizational structures and talent pools. Both Meituan and Ele.me emphasize establishing digital talent systems and changing management mechanisms. Meituan implemented a "New Policy" for rider training, offering three support strategies for new riders: "one-on-one mentorship," "easier task assignments for beginners," and "newcomer discount cards" [5]. These measures provided mentorship during onboarding to prevent excessive workloads while boosting income expectations through incentive discounts. The result was a 13.5% increase in new rider satisfaction, attracting more individuals to join the delivery workforce. Additionally, Meituan established hybrid "technology + operations" teams internally, continuously recruiting data engineers, algorithm experts, and product managers while emphasizing "data-driven decision-making" in its corporate culture. Ele.me equipped riders with smartphones and smart insulated boxes, and continuously improved operational standards through online training and safety education. Simultaneously, Ele.me improved rider welfare through internal mechanisms like rider insurance, rest stations, and flexible scheduling, boosting rider belonging and service quality. Furthermore, leveraging Alibaba's technological strengths, Ele.me introduced a digital human resources system at the operational management level, automating personnel scheduling and performance evaluation. In summary, food delivery platforms have supported their transformation by streamlining management structures, recruiting tech-savvy talent, and continuously training employees in digital capabilities. Moving forward, they will continue enhancing team flexibility and employee digital skills to maintain competitiveness.

## 3. Differentiated Transformation Pathways for Various Service Industries (Focusing on Education and Healthcare)

The distinct operational characteristics of different service industries dictate variations in their digital transformation pathways. The following sections discuss the education and healthcare sectors separately.

### 3.1 Pathways for Transformation in the Education Sector

The education sector is characterized by strong continuity in teaching and learning, a highly concentrated service population, and stringent regulatory requirements. The COVID-19 pandemic forced schools to shift their educational models, rapidly replacing traditional classroom instruction with online distance learning. Teachers and students conducted educational activities through video conferencing and online platforms. However, the digital transformation of education faces challenges including adapting teaching methods, digitizing course content, and ensuring educational equity. In response, government policies emphasize establishing a new teaching model

that "deeply integrates online and offline learning," accelerating the adoption of smart education platforms and the development of educational information infrastructure. Specific approaches include developing online teaching resources such as live-streamed classes, advancing the construction of smart classrooms, and enhancing digital literacy training for teachers. For instance, the national education system is promoting the National Smart Education Platform to enable multiple regions and schools to share high-quality educational resources, providing technological support for the sector's digital transformation. Compared to food delivery logistics, educational digitization prioritizes innovation in teaching content and methods, evolving from reactive emergency remote teaching toward technology-based personalized learning and management models. The education sector's digital transformation exhibits distinct characteristics and diversity. Unlike fast-moving consumer services like food delivery, education focuses on knowledge dissemination and individual growth, emphasizing "learning outcomes" and "educational equity." Online education platforms typically center on content quality and teaching effectiveness as core objectives. Khan Academy, a nonprofit online education organization, was founded with the mission to "provide free, world-class education for anyone" [8]. Through video lessons, practice exercises, and personalized learning dashboards, it delivers educational resources to students without geographical constraints. Leveraging data analytics, Khan Academy automatically recommends follow-up exercises based on students' performance and progress, enabling true personalized learning [9]. Recently, Khan Academy partnered with Microsoft to integrate Azure cloud services and small AI models (such as Phi-3) in developing the AI tutoring tool "Khanmigo." This enables teachers to rapidly generate personalized lesson plans, grouping schemes, and tiered assignments [8]. These initiatives reflect the education sector's trend toward enhancing teaching efficiency through technological innovation.

Meanwhile, MOOC platforms such as Coursera cater to a broader audience encompassing university students, professionals and lifelong learners. Collaborating with over 190 universities and enterprises worldwide, Coursera offers thousands of courses and degree programmes [10]. Its "free + paid (certificate)" model enables access to high-quality education at low or even zero cost. According to reports, Coursera had surpassed 45 million users by 2019, demonstrating a highly digitalised model: leveraging vast learning behaviour data from its platform, it employs machine learning algorithms to send personalised emails recommending the "next best course" and continuously refines assignments and course content based on student feedback [10]. Furthermore, Coursera collaborates with governments and enterprises globally—such as Singapore and Egypt partnering with Coursera to cultivate talent—demonstrating the integration of digital education with policy support. Overall, the core of education digitisation lies in resource accessibility and personalised learning processes. Unlike standardised manufacturing, education prioritises instructional design and learning psychology, with technological applications focusing more on interactive platforms, content management systems, AI tutoring, and big data analytics [9].

### 3.2 Pathways for Transformation in the Healthcare Sector

The healthcare sector, with its critical safety and privacy requirements and complex regulatory environment, has prioritised digital transformation pathways centred on telemedicine and data-driven services. During the pandemic, demand for online healthcare surged; research indicates that COVID-19 accelerated the digitisation of medical services, with user numbers on online consultation platforms rising rapidly. This reflects the widespread adoption of technologies such as telemedicine and mobile healthcare within medical services. Building upon this foundation, hospitals and clinics have vigorously promoted applications like remote patient monitoring and intelligent image analysis to enhance diagnostic efficiency and quality. However, healthcare digitisation also faces unique challenges: Hundal et al. note that digital transformation within healthcare enterprises is particularly difficult, with key obstacles including stringent regulatory compliance requirements, significant cultural resistance, insufficient IT skills among medical staff, and poor interoperability of medical data [11]. Consequently, the transformation pathway for healthcare institutions must balance multiple factors including patient experience, security and privacy, and regulatory compliance. On one hand, the digital healthcare trajectory emphasises the integration of technology with clinical diagnosis, exemplified by the combination of remote consultations and in-person appointments. On the other hand, industry policies and standards continue to evolve, providing institutional support to safeguard data security and service quality. Overall, the digitalisation path in healthcare places greater emphasis on health services, with its transformation process being both technology-driven and profoundly influenced by the dual forces of policy regulations and societal demands.

## 4. Safeguards for the Digital Transformation of the Service Sector

Advancing the digital transformation of the service sector requires the provision of supporting safeguards at three levels: policy, enterprise, and industry.

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### 4.1 Policy Level

The government serves as a key driver of industrial digital transformation. Relevant departments of the State Council have proposed establishing cross-departmental working mechanisms to strengthen organisational coordination and policy safeguards. Specific policy measures include: increasing investment in public infrastructure (such as 5G networks, cloud computing platforms, and IoT sensor networks); providing financial support and tax incentives; and formulating digital standards and evaluation systems. For instance, policies mandate enhanced application of cutting-edge technologies—including BeiDou navigation, 5G, cloud computing, big data, blockchain, and artificial intelligence—within the service sector to lower enterprise transition barriers. Concurrently, they encourage establishing digital empowerment centres and platforms offering consultancy, training, and operational hosting services to provide traditional enterprises with „end-to-end solutions"[2]. Furthermore, the policy places particular emphasis on talent development and standardisation, encouraging higher education institutions and vocational colleges to establish digital service-related programmes and organise training base development. It also promotes the formulation and adherence to national data management standards and industry norms. Through these policy measures, the government has created a favourable macro-environment and institutional safeguards for the digital transformation of the service sector.

### 4.2 Enterprise Level

Enterprises are the primary agents of digital transformation, requiring internal reforms to achieve sustainable development. Firstly, businesses must incorporate digital transformation into their strategic objectives and cultivate digital leadership with cross-departmental collaboration capabilities. Manjunadh and Manoj emphasise that visionary leadership, a customer-centric culture, and continuous learning mechanisms are critical success factors for logistics service providers undertaking digital transformation [3]. Food delivery and other service enterprises should establish agile organisational structures, encourage deep integration between business and IT departments, and implement improvement mechanisms. Secondly, enterprises should increase investment in technology and talent, addressing the shortage of IT professionals through a combination of recruitment and internal development. Digital transformation frequently demands new employee competencies, such as data analytics and software development. Establishing in-house training programmes or collaborating with higher education institutions to cultivate digital skills can enhance an organisation's transformative capacity. Furthermore, companies should prioritise change management and employee motivation, promoting successful transformation case studies to foster a corporate culture embracing digitalisation. Only through comprehensive reform at the talent and organisational levels can technological and process innovations be genuinely implemented and converted into competitive advantages.

### 4.3 Industry Level

At the industry level, safeguarding measures primarily encompass the establishment of standard systems, data security assurance, and industrial collaboration. Firstly, it is essential to establish and refine industry standards to enhance interoperability and collaborative efficiency. The government advocates advancing a set of usable, user-friendly digital standards within the lifestyle services sector, alongside developing unified data interfaces and evaluation systems[2]. For instance, platforms and enterprises are encouraged to adhere to national data management standards, improving service efficiency through data sharing. Secondly, industry associations and platform enterprises should play a leading role in demonstrating best practices to foster a digital ecosystem. The guidance emphasises cultivating digital brands within the daily services sector, encouraging leading enterprises and platforms to participate in enabling initiatives, and providing technical support and training for micro and small enterprises. The sector must also strengthen cybersecurity and data privacy protections, particularly in fields such as healthcare, while establishing credit management and risk prevention mechanisms. Finally, fostering cross-sector collaboration represents a crucial direction. Examples include integrated innovation between education and tourism/culture sectors, or healthcare partnerships with technology firms to develop health management applications – all collectively advancing industrial digitalisation. Through technology sharing, experience exchange, and joint innovation, the industry can provide sustained momentum for comprehensive transformation.

## 5. Conclusion

This paper examines pathways for digital transformation within the service sector. Through case studies in food delivery logistics, education, and healthcare, it highlights the diversity of digital practices across different scenarios. In food delivery logistics, technological empowerment, process re-engineering, and organisational change constitute the three core transformation pathways. Within education and healthcare, digitalisation pathways exhibit distinct emphasis: the former prioritises pedagogical innovation and resource sharing, while the latter focuses on remote service delivery and data security. Concurrently, governments must formulate supportive policies and enhance infrastructure alongside standards; enterprises require strengthened strategic planning and talent development;

and the sector necessitates the establishment of a digital ecosystem.

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