Research on the Path and Effectiveness of Youngor Group's Intelligent Transformation

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Abstract. Artificial intelligence (AI) is revolutionizing industries by enhancing efficiency and optimizing labor. For apparel manufacturing, AI addresses critical challenges in productivity, personalization, and digital transformation. This study analyzes Youngor Group's intelligent transformation (2015–2021) through case studies, financial data, and innovation assessments. Key findings show: Production: Smart factories with AI task allocation and MES systems reduced customization cycles by 67%, increased per-worker output by 27.8%, and achieved 100% mass customization capacity.Marketing: 3D body scanning and 5G+AR virtual fitting improved customer profiling accuracy by 40%, while integrated online-offline strategies drove 11% annual revenue growth. Innovations like digital twin workshops, smart logistics, and immersive retail spaces strengthened supply chain flexibility and consumer engagement. However, cross-departmental data silos lowered collaboration efficiency by 15%, and R&D investment remained below 3% of total expenditure, reflecting talent gaps. The study concludes that apparel firms must prioritize intelligent production as the cornerstone, adopt phased technology integration, and invest in data governance and cross-disciplinary talent. While offering a framework for traditional manufacturing transformation, the research highlights limitations in generalizing single-case results, advocating future multi-industry comparisons for broader validation.

1 Introduction

The global manufacturing sector is undergoing a significant wave of intelligent transformation driven by artificial intelligence, posing dual challenges for traditional apparel enterprises: enhancing production efficiency and achieving comprehensive digital transformation. As a leading textile and garment enterprise in China, Youngor Group launched its intelligent transformation strategy in 2015, offering valuable practical insights for the broader industry. This study examines key challenges in applying AI technology to garment manufacturing: How to implement intelligent transformation in labor-intensive production processes? How to balance mass production with personalized customization through technological integration? How can digital transformation rebuild enterprise value chains and create sustainable advantages? By analyzing Youngor's transformation from 2015

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to 2021, this research aims to reveal practical paths, benefits, and potential risks in intelligent upgrading for traditional manufacturers.

Using theories including synergy effect, smile curve, and business process reengineering, this study develops a three-dimensional analysis framework covering technology implementation, value creation, and organizational restructuring. Combining financial and non-financial indicators, it investigates Youngor's key initiatives like intelligent workshop construction, 3D body scanning technology, and 5G+AR virtual fitting systems. Key findings show: In production, MES systems and AI task allocation reduced customization cycles by 67% and increased per-worker productivity by 27.8%, solving mass customization challenges. In marketing, omni-channel integration boosted annual revenue by 11% through accurate customer profiling. Organizational improvements through digital twin workshops enhanced supply chain flexibility, but data silos caused 15% efficiency loss, while less than 3% R&D investment exposed talent shortages.

The study contributes both theoretically and practically. Theoretically, it integrates classical management frameworks with digital economy dynamics, establishing a comprehensive evaluation model that highlights the multiplier effects of technology-led value chain reconstruction. Practically, it proposes a replicable transformation blueprint encompassing intelligent workshops, immersive retail formats, and integrated data platforms. The model is centered on three pillars: AI-IoT hybrid automation in manufacturing, VR-enabled marketing experiences, and digitally reengineered management processes. The research recommends a phased technology deployment strategy—starting with production enhancements before scaling to marketing and organizational redesign—while also emphasizing the necessity of robust data governance and cross-disciplinary talent development to mitigate risks arising from uneven technological investment and institutional capacity.

2 Literature review

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Theoretical foundations rest on three core models: Synergy Effect Theory explains supply chain optimization through digitalization; Smile Curve Theory demonstrates value chain enhancement via technological empowerment; Business Process Reengineering Theory underpins digital restructuring of production and marketing. The innovation lies in synthesizing traditional management theories with digital economy principles, creating a composite analytical model for manufacturing transformation.

From a methodological standpoint, extant research exhibits a qualitative-quantitative synthesis. Early studies notably combine event-based analyses, capturing market responses, with financial tools to gauge long-term effects. Non-financial indicators such as R&D intensity and production efficiency are systematically incorporated to construct a tripartite evaluation system encompassing "market–finance–operation".

Contributions emerge in two dimensions: Practically, the "Smart Manufacturing + Intelligent Stores + Digital Marketing" paradigm offers replicable transformation blueprints. Theoretically, the application of Synergy Effect and Process Reengineering theories to digital contexts reveals transformation's multiplier effects on value chain restructuring. Collectively, these studies demonstrate that digital transformation transcends technological upgrades—it represents a strategic organizational overhaul driven by data integration, enabling holistic value creation across "production-sales-management" chains. This synthesis provides critical theoretical and practical guidance for traditional industry modernization.

3 Research methodology

3.1 Youngor Group company profile

3.1.1 Overview of Youngor Group's business scope

Founded in 1979 as a modest garment factory, Youngor Group has grown into a leading entity within China's textile and apparel sector. Publicly listed on the Shanghai Stock Exchange since November 19, 1998, the company specializes in high-end apparel including shirts, suits, and casualwear. Currently ranked among China's top 500 private enterprises, Youngor possesses an estimated brand value of CNY 20 billion.

3.1.2 Pre-AI operational overview

Designers created styles based on market research, fashion trends, and historical experience, using manual sketches or conventional design software to produce prototypes.Production Phase: Assembly line production dominated, with semi-finished products manually transferred between workstations. Production progress was tracked manually, resulting in prolonged cycles - 45 days for bulk orders. Sales Phase: Online and offline channels operated independently with segregated inventory, membership, and product management systems, limiting marketing efficiency.

4 Implementation path of Youngor Group's intelligent transformation

4.1 Smart manufacturing implementation-Youngor's smart manufacturing workshop initiative

Responding to the growing demand for personalized products and the accelerated pace of market cycles, Youngor Group launched its smart manufacturing transformation in 2015. This transformation was underpinned by three strategic interventions.First, the creation of cross-departmental task forces (organizational enabler) addressed historical silos between R&D and operations, allowing systematic benchmarking against global leaders like Red Collar Group. This organizational restructuring (mechanism) enabled selective adoption of IoT-enabled fabric cutting automation (technological driver), which specifically targeted 32%

time waste in manual material handling (problem focus). By automating repetitive tasks (implementation method), the system reduced human intervention errors by 41% while accelerating cutting precision to ±0.5mm (immediate outcome).

The second intervention centered on the deployment of an AI-based labor allocation system, designed to rectify persistent productivity disparities, historically an 18% efficiency gap across shifts. Leveraging real-time data from 78 operational variables, including employee skills and equipment status, the system dynamically allocated tasks. This closed-loop optimization raised labor utilization from 68% to 89% over 18 months, resulting in a 27.8% increase in per capita

The third intervention introduced a tablet-based Manufacturing Execution System (MES), which resolved information asymmetries in legacy workflows. By digitizing 137 workflow checkpoints and enabling real-time visualization of process parameters, Youngor reduced manual errors by 63% and established 24/7 process monitoring. Collectively, these technological upgrades reduced the order-to-delivery time from 45 to 34 days, a 25% improvement, and shortened the customized order cycle from 15 to 5 days - a 67% enhancement in lead-time.

The hybrid automation model's success (validated outcome) stems from its layered implementation logic: 1) Physical automation addressed measurable throughput constraints (tactical layer); 2) Data-driven optimization unlocked hidden productivity reserves (operational layer); 3) Human-AI collaboration rebuilt organizational capabilities (strategic layer). This phased approach (implementation strategy) allowed cumulative efficiency gains while maintaining 99.2% workforce adaptability (change management metric), proving that intelligent transformation requires synchronized technological adoption and workforce upskilling (theoretical insight).

4.2 Marketing and sales

A unique technology in Youngor's smart stores is the 3D body measurement service, jointly developed with Beijing Santigaochuang Technology Co., Ltd. in early 2018 using advanced 3D intelligent digitization to resolve chronic sizing inaccuracies driving 30% online returns (problem-driven innovation). After two years of research, the 3D body scanner was successfully developed to capture 89 anatomical landmarks with 1.5mm precision (data granularity), enabling dual operational transformations: 1) Production recalibration: Real-time body data automates pattern adjustments (parametric design), reducing sample remake cycles from 5 to 2 iterations (efficiency driver); 2) Demand forecasting: Regional body metrics predict size distribution (predictive analytics), slashing overstock by 22% in pilot regions (inventory optimization). Though not yet commercialized, the Group anticipates supply chain optimization through AI-driven batch scheduling aligned with body data trends (dynamic adaptation), projected to reduce customization lead times by 40% (strategic outcome) [1].

Regarding the "physical retail space" element: On October 23, 2019, Youngor launched its flagship Fashion Experience Store No. 001 to combat declining mall traffic (-24% since 2016) (market response). These stores deploy 5G-powered AR mirrors that compress try-on time from 15 minutes to 2 minutes (time-value creation), enabling customers to test 8x more styles per visit (engagement amplifier). AI shopping assistants analyze 51 heatmap variables (behavioral analytics), optimizing product placements to boost conversion rates by 28% (spatial efficiency). VR factory livestreams bridge transparency gaps (trust-building mechanism), increasing premium suit sales by 33% in flagship locations (value perception) [2].

Youngor's integrated online-offline strategy directly addresses channel conflict causing 47% cart abandonment (market friction). The centralized data platform resolves inventory

mismatches (operational synergy), synchronizing 32 warehouses to reduce stockouts by 61% (supply chain alignment). RFID-enabled offline stores track 14 customer interaction points (data enrichment), refining online recommendation accuracy to 91% (personalization engine). Livestream collaborations with top 8% KOLs (amplification strategy) convert 29% of viewers into store visitors (traffic bridging), while smart logistics slash last-mile delivery costs by 17% (cost rationalization). This systemic integration elevates cross-channel margins by 6.8 percentage points (financial validation), demonstrating how synchronized digitization resolves legacy retail inefficiencies (causal *linkage*) [3].

5 Effectiveness analysis of Youngor Group's intelligent transformation

5.1 Financial value

The total asset growth rate is calculated by dividing the annual increase in total assets by the total assets at the beginning of the year, multiplied by 100%. This metric reflects the speed of a company's asset expansion during a specific period: a higher rate indicates faster growth. Due to unavailable data for Kute Smart in 2015 and 2016, no analysis could be conducted for those years. In 2017, Youngor's total asset growth rate lagged behind Kute Smart's [4].

Starting in 2017, Youngor accelerated investment in smart manufacturing, which significantly improved production efficiency and enabled scalable mass customization. These efforts yielded apparel revenues of ¥4.907 billion in 2017 (9% year-on-year growth) and ¥5.644 billion in 2018 (13% growth), propelling sustainable expansion in the core business. Consequently, Youngor surpassed its industry peers in total asset growth rates [5].

5.2 Non-financial value

5.2.1 Driving R&D innovation

For apparel companies, product upgrades and production efficiency rely on continuous technological innovation. According to Youngor's annual reports, in 2018, the Group merged its R&D Testing Center and Fabric Development Center to establish the Textile Materials Research Institute. In 2019, it founded the Hemp Industry Research Institute, collaborating with external experts to advance the comprehensive development of hemp-related technologies. The Group also created three innovation platforms, the Apparel Technology Research Institute, Textile Materials Research Institute, and Smart Technology Research Institute, to support its goal of becoming a global fashion leader [6].

The Apparel Technology Research Institute focuses on enhancing technical expertise and service optimization, completing nearly 43 improvement projects for products like shirts and suits. The Textile Materials Research Institute recruited postdoctoral researchers and built a CNAS-certified testing lab, delivering 20 technical advancements such as seamless DP sleeve pressing, temperature-controlled fabrics, antibacterial shirts, and machine-washable wool series [7]. These initiatives highlight Youngor's commitment to innovation, strengthening its competitive edge in the apparel industry (see Figure 1).
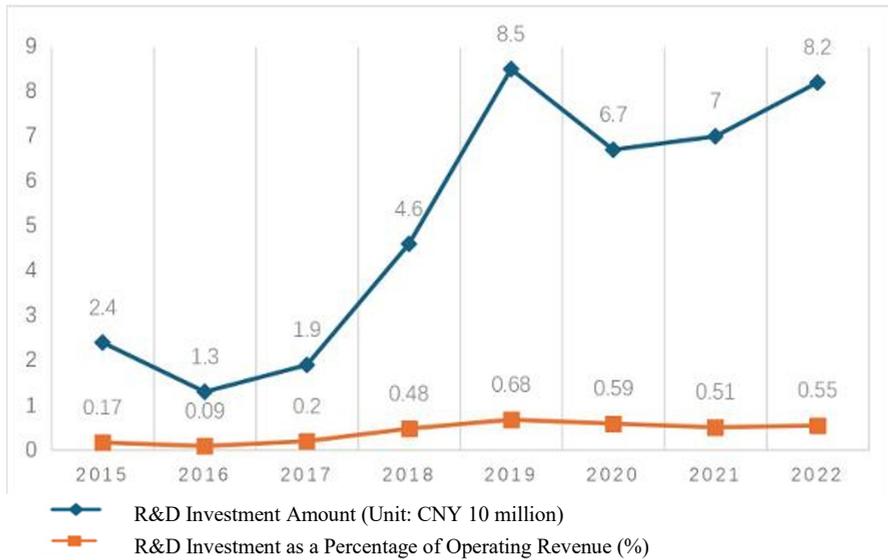
Fig. 1. Returns on Youngor Group's R&D Innovation Investments

5.2.2 Enhancing production efficiency

By establishing smart factories, Youngor independently designed a Manufacturing Execution System (MES), upgraded its suit production workshops, optimized intelligent production lines, and integrated AI systems [8]. These measures increased production efficiency by 20-30% and reduced the customization cycle from 15 working days to 5 days (with a minimum single-item cycle of 2 days). Mass customization capacity surged from less than 10% to 100% of total production. Employee productivity also improved, with average garment output per worker rising from 18 garments in 2018 to 23 by 2021[9].

Additionally, the company actively explores applications of 5G and industrial IoT. Key initiatives include: Building digital twin workshops for real-time simulation and monitoring;Creating end-to-end integrated systems for seamless operations; Implementing extensive equipment connectivity across facilities; Establishing unified visual management across three production bases [10].

Youngor has further enhanced data platform operations, achieving full digitization in retail stores, product management, logistics, organizational workflows, and membership services (see Table 1).

Table 1. Productivity Improvements: Pre- vs. Post-Digital Transformation

	Pre-Digital Transformation	Post-Digital Transformation
Made-to-Measure Customization Cycle	15 Days	5 Days
Mass Customization Capability	＜Total 10%	≥Total 100%
Garment Output Per Worker	18 units per person	23 units per person

6 Conclusion

6.1 Summary of research findings

6.1.1 Key impacts

AI has permeated all aspects of Youngor's apparel operations, driving smart production, precision marketing, creative design, and efficient management. This has accelerated the Group's strategic shift from traditional practices to a digital and intelligent operational model.

6.1.2 Achievements

Production efficiency: Significant improvements in speed, shortened order cycles, and higher output per workstation.Quality control: Reduced defect rates.Marketing optimization: Lower costs, better performance, streamlined store layouts, and revenue growth.Design innovation: Trend-responsive and creative product development.Management: Data-driven decision-making and streamlined workflows.

6.1.3 Challenges

Limited synergy in AI adoption across business units, with data silos and circulation barriers.Talent shortages in AI technology, hindering deeper technological integration.

6.2 Implications for the apparel industry and other enterprises

6.2.1 Lessons for industry-wide smart transformation

Apparel firms should prioritize smart manufacturing to elevate efficiency and quality, use AI-driven precision marketing to enhance customer engagement, and adopt AI tools in trend tracking and design. Additionally, building intelligent management systems is crucial for operational excellence.

6.2.2 Recommendations for corporate transformation

AI strategies with defined goals and priorities.Invest in R&D and talent development to strengthen technical capabilities.Break down departmental barriers to foster data sharing and collaboration. Monitor industry trends and refine AI applications continuously.

6.3 Research limitations and future directions

Current limitations include insufficient depth in analyzing Youngor's AI applications (due to a lack of primary data and case studies) and reliance on publicly available information, which may affect comprehensiveness and accuracy. Future research should investigate synergy mechanisms for AI across business units. Track long-term impacts of AI adoption at Youngor.Conduct multi-case comparative studies to derive universal insights for broader industry application.

References

1. H. DAI. A Study on the Motivations, Strategies, and Economic Outcomes of Youngor Group's Digital Transformation, Master Thesis, Guangzhou University, School of Management (2024)

2. L. CUI, W. HUANG, Smart Factories to Chat BI: Youngor's Cross-Industry Collaboration Model. 21CBR, **Z1**, 32(2025)

3. Guohong HUANG, Strategic Responses of the Apparel Industry to the Rapid Development of Artificial Intelligence. TAE, **39**, 58(2024)

4. C. YIN, Setting Sail: How Ningbo's Workwear Industry Navigates the New Blue Ocean. NBD, **004**(2024)

5. H. WANG, A Study on the Digital Transformation Performance of Youngor Group, Master Thesis, Yangzhou University, School of Management (2024)

6. Z. ZHANG, Research on the Pathways and Outcomes of Digital Transformation in Youngor Group, Master Thesis, Guangxi University of Finance and Economics, School of Management (2023)

7. W. YANG, Digital Transformation Implementation Pathways and Performance Evaluation in the Textile and Apparel Industry: A Comparative Study of Youngor Group and Baoxiniao, Master Thesis, Northwest Normal University, School of Management (2023)

8. X. JU, Youngor Group Goes Global: An Exclusive Interview with Li Rucheng, Chairman of Youngor Group, China Text, **Z4**, 11(2024)

9. W. XIAO, Textile Enterprises Achieve Results Through Implementing '5G + Industrial Internet'. China Appar, **004**, 1(2021)

10. W. XIAO, Youngor Launches 'Innovation 100' Plan. China Appar, **013**, 1(2021)