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# ORGANIZING THE STRATEGIC MANAGEMENT OF KNITTING AND SEWING ENTERPRISES IN THE DIGITAL ECONOMY

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**Abstract**

This article provides a scholarly and practice-oriented analysis of how strategic management can be effectively organised in knitwear and garment enterprises under the conditions of a digital economy. The study evaluates the impact of digitalisation on production operations, supply-chain management, marketing, and financial governance, and clarifies the mechanisms through which corporate strategies are formulated and implemented in industry settings. Based on a comparative review of national and international practices, the paper identifies the sector's major constraints as insufficient digital infrastructure and IT competencies, weak adoption of data-driven decision-making, and the incomplete deployment of ERP/MES/CRM systems. The findings demonstrate that enhancing competitiveness requires a well-defined digital transformation roadmap, end-to-end optimisation of business processes, systematic development of human capital, real-time monitoring of quality and supply flows, and the integration of management instruments such as KPIs and the Balanced Scorecard. The article concludes by offering practical recommendations to adapt strategic management in knitwear and garment enterprises to the realities of a digital environment.

**Keywords**

Digital economy, knitwear industry, strategic management, digital transformation, ERP/MES/CRM, data-driven decisions, supply chain, KPI, competitiveness.

## Introduction

In recent years, the global economy has increasingly moved away from a "calm and predictable path" toward a more turbulent one: geopolitical tensions, the expansion of trade restrictions, disruptions in logistics chains, and rapid shifts in consumer demand are forcing manufacturing companies to adopt not merely

conventional planning, but agile, data-driven strategic management. This pressure is particularly strong in the textile–apparel segment, where product life cycles are short, fashion trends change quickly, and customers increasingly prioritize quality, transparency, and sustainability rather than "price only." From this perspective, organizing strategic management under the conditions of a digital economy is no longer a purely theoretical topic; it has become a practical instrument for survival and competitive advantage.

Global requirements for textile and clothing products are also evolving. In the European Union, stricter rules related to product origin, supply-chain responsibility, human rights, and environmental impact are being introduced. The Corporate Sustainability Due Diligence Directive (CSDDD/CS3D), which entered into force on 25 July 2024, makes supply-chain transparency and risk management a strategic necessity for export-oriented manufacturers.[1] At the same time, the EU's policy direction under the Ecodesign for Sustainable Products Regulation (ESPR), along with emerging requirements such as the Digital Product Passport for textiles, gradually turns digital traceability and structured product data into a new norm.[2] The message for firms is simple: "good stitching" is no longer enough — companies must also manage well.

For Central Asia and Uzbekistan, another critical dimension of global change relates to logistics geography. Competition among transport and transit corridors is intensifying in the region; multimodal routes such as the "Middle Corridor" (Trans-Caspian International Transport Route) are increasingly discussed as alternative options in Europe–Asia trade.[3] For a landlocked economy like Uzbekistan, this trend represents both an opportunity and a risk: an opportunity to access new markets, and a risk because logistics cost, lead time, and reliability directly influence competitiveness. Consequently, textile and knitwear–garment strategies must place supply-chain digitalization, demand forecasting, inventory optimization, and delivery lead-time management (SCM) at the center of decision-making.

Uzbekistan is also pursuing digital economy development at the level of state policy. The "Digital Uzbekistan — 2030" Strategy sets priorities for accelerating digital transformation and implementing digital solutions across public administration and key economic sectors.[4] In parallel, the "Uzbekistan — 2030" Strategy (approved on 11 September 2023) prioritizes industrial development, higher value addition, and faster technological modernization; textiles are included among the sectors expected to drive these goals.[5] In practice, sectoral reforms are reinforced by targeted policy documents: the Presidential Decree of 1 May 2024 aims to take the textile and garment–knitwear industry to a "new stage of

development,"[6] while earlier roadmaps, including the 2017 decree, systematized measures to accelerate sectoral growth.[7] More recent policy initiatives in 2025 further signal new performance targets focused on exports and reform acceleration.[8] The conclusion is straightforward: the state expects large outcomes from the sector; therefore, company management cannot remain in "yesterday's mode."

At this point, the domestic legal framework becomes especially important. Uzbekistan has established legal foundations enabling companies to use electronic contracts, digital settlements, electronic document circulation, and electronic signatures: the Law "On E-Commerce,"[9] the Law "On Electronic Digital Signature,"[10] and the Law "On Electronic Document Management"[11] provide practical legal mechanisms for digital transactions and documentation. In addition, when companies handle customer, employee, or partner data, they must comply with the Law "On Personal Data."[12] For export-oriented knitwear–garment enterprises, standardization and the quality infrastructure also become strategic factors: the Law "On Standardization" defines the national system and provides a basis for alignment with international standards.[13] In other words, strategy does not start with "we will produce," but with "how, under which standards, to meet which market requirements, and within which regulatory environment."

Accordingly, this article analyzes the theoretical foundations and practical mechanisms for organizing strategic management in knitwear–garment enterprises under the conditions of a digital economy. The relevance of the study is justified by three interrelated factors: (1) global supply-chain and ESG/transparency requirements are strengthening;[1][2] (2) the regional configuration of transport corridors and foreign trade is shifting;[3] (3) Uzbekistan's strategies up to 2030 prioritize digitalization and industrial development through higher value addition.[4][5] On this basis, the article develops approaches for linking corporate strategy with digital transformation, directing resources (human capital, investment, and data) effectively, and forming a results-oriented management model. "Digital" is not only speed; "digital" means management that measures, calculates, and draws conclusions — everything else is just a nice presentation.

**Literature review on the topic.**

According to A. Mustapaev, value chain analysis in the sewing sector helps identify knowledge and skill gaps among young workers in workshops, reveals existing constraints that push them to change workplaces frequently, and highlights promising opportunities for organizing sewing production in rural areas.[14] This perspective is strategically significant: before investing in digital technologies, an enterprise should diagnose where value is being lost in its

production and management processes and determine whether those losses stem primarily from weak employee competencies or from organizational and regulatory limitations. In this sense, competency management becomes a measurable strategic tool rather than an HR formality.

Based on the Russian context, Larionov and co-authors emphasize that external environmental shifts increasingly force textile (and, more broadly, light-industry) enterprises to revise their strategies. In the conditions of digitalization, "smart manufacturing," digital engineering, digital twins, new employment patterns, and systematic re-skilling programs become integral elements of corporate strategy.[15] This approach is directly relevant for knitwear and garment enterprises: in a sector where product assortments change rapidly, sustainable management of production planning, resource utilization, and stable quality is difficult to achieve without digital platforms and integrated information systems.

Using evidence from Indonesian garment enterprises, Ariyani et al. analyze Industry 4.0 adoption through the Technology–Organization–Environment (TOE) framework and demonstrate that digitalization tends to develop along two directions: (a) production technologies (equipment upgrades, automation), and (b) management technologies (software systems and data-driven decision-making).[16] The main barriers highlighted include high implementation costs, integration problems between systems, and insufficient workforce competencies.[16] This supports the strategic argument that enterprises should implement a phased digital transformation portfolio: first establishing reliable accounting/warehouse/quality data capture, then introducing production dispatching and operational control, and only thereafter scaling analytics and forecasting.

The adoption of digital tools in the SME segment has also received substantial attention. Susanty et al. examine factors influencing digital technology adoption among textile and garment SMEs through an extended UTAUT model and find that trust, government support, and competitive pressure—external factors—significantly shape adoption, while digital practices subsequently affect both financial and non-financial performance outcomes.[17] This insight is particularly relevant for Uzbekistan: effective strategy is not only about internal reorganization, but also about aligning the enterprise with external institutions and ecosystems (support programs, standards, cooperation networks, and the competitive environment).

In the area of logistics and supply-chain digitalization, Zhang, Lin, and Esfahbodi conduct a systematic review of 109 peer-reviewed papers on RFID-based supply-chain digitalization, distinguishing "social" and "technical" success factors and explaining how synergies emerge during implementation.[18] For knitwear

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and garment enterprises, this is especially important: end-to-end traceability—from raw materials to finished products—has become a strategic resource for meeting export requirements, strengthening quality control, analyzing returns, and improving inventory turnover. Thus, strategic management in the digital economy increasingly requires linking production productivity with supply-chain data and real-time logistics visibility.

Overall, the literature indicates that organizing strategic management in knitwear and garment enterprises under digital-economy conditions cannot be reduced to simply purchasing IT solutions. For digital transformation to generate measurable results, (14) competency development and motivation systems, (15) integrated management information systems, (16) quality and traceability standards, and (17) digitalization of logistics and warehouse processes should be planned and managed as a single, unified strategy. At the same time, empirical evidence remains limited specifically for Uzbekistan's knitwear–garment enterprises regarding practical implementation models, KPI architectures, roadmaps, and phased investment designs—an important research gap this article aims to address.

**Research methodology**

This study examines how strategic management can be organized in knitwear and garment enterprises under the conditions of a digital economy through a combined methodological approach. First, a systems analysis was used to identify the interdependencies between digital technologies (ERP/MES/CRM), human capital, production processes, quality management, and supply-chain operations. Second, an empirical assessment based on sector statistics, enterprise surveys, and semi-structured interviews evaluated the current level of digitalization, IT competencies, data-driven decision-making practices, and major operational bottlenecks. Third, a comparative analysis benchmarked Uzbekistan's experience against the practices of South Korea, Turkey, and China. Finally, economic and quantitative methods were applied to determine the factors with the strongest impact on productivity and performance—such as technological modernization, workforce skills, motivation mechanisms, defect rates, logistics lead times, and the extent of digital system utilization.

**Analysis and Results**

This section evaluates the relationship between digitalization and firm performance in knitwear–garment enterprises using the empirical evidence (survey data and semi-structured interviews) combined with comparative insights. The analysis links digital transformation (ERP/MES/CRM adoption, e-warehouse/accounting, real-time monitoring) to outcomes in labour productivity,

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quality, and logistics performance. Enterprises were grouped by a Digital Maturity Index (0–100) into three bands (low / medium / high). The results show a clear pattern: firms with higher digital maturity demonstrate more disciplined production planning, faster identification of operational bottlenecks, lower defect/rework rates, and shorter order-fulfilment lead times. In contrast, low-maturity firms typically rely on fragmented information flows (paper/Excel), managerial decisions are more intuition-based, and performance losses appear through higher rework and frequent delivery delays. Overall, the evidence supports the strategic conclusion that digitalization creates value when it is embedded into end-to-end management routines and tied to measurable KPIs across production and the supply chain.

Table 1.

Key indicators by digital maturity group (summary)[26]

| Indicator | Low digital maturity | Medium digital maturity | High digital maturity |
|---|---|---|---|
| Digital maturity index (0–100) | 0–39 | 40–69 | 70–100 |
| Labour productivity (index, 100=average) | 88–95 | 98–103 | 110–118 |
| Defect rate (%) | 5.5–7.5 | 3.5–5.0 | 2.0–3.2 |
| Order fulfilment lead time (days) | 12–16 | 9–12 | 6–9 |
| Training intensity (hours/month) | 2–4 | 4–6 | 6–10 |
| KPI/bonus system implemented (share) | low | medium | high |

**To quantify the drivers of productivity, a robust regression model was estimated (economic–quantitative approach). The dependent variable is the log of productivity (ln_prod), and the explanatory variables include the Digital Maturity Index, training hours, defect rate, lead time, and a KPI/bonus dummy variable. The STATA output (Figure 1) indicates that digital maturity and KPI/bonus mechanisms have a positive and statistically significant association with productivity, whereas defect rate and lead time show negative and significant effects. From a managerial standpoint, this implies that digital transformation is most effective when implemented as a strategic system aimed at reducing quality losses and delivery delays—rather than as a purely technical IT purchase.**

The figure below illustrates how labour productivity (index) is distributed across the sampled knitwear–garment enterprises (100 = sample average). It helps

[26] Author's development

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to quickly see whether productivity levels are clustered around the average or spread out, and which ranges contain the largest share of observations.

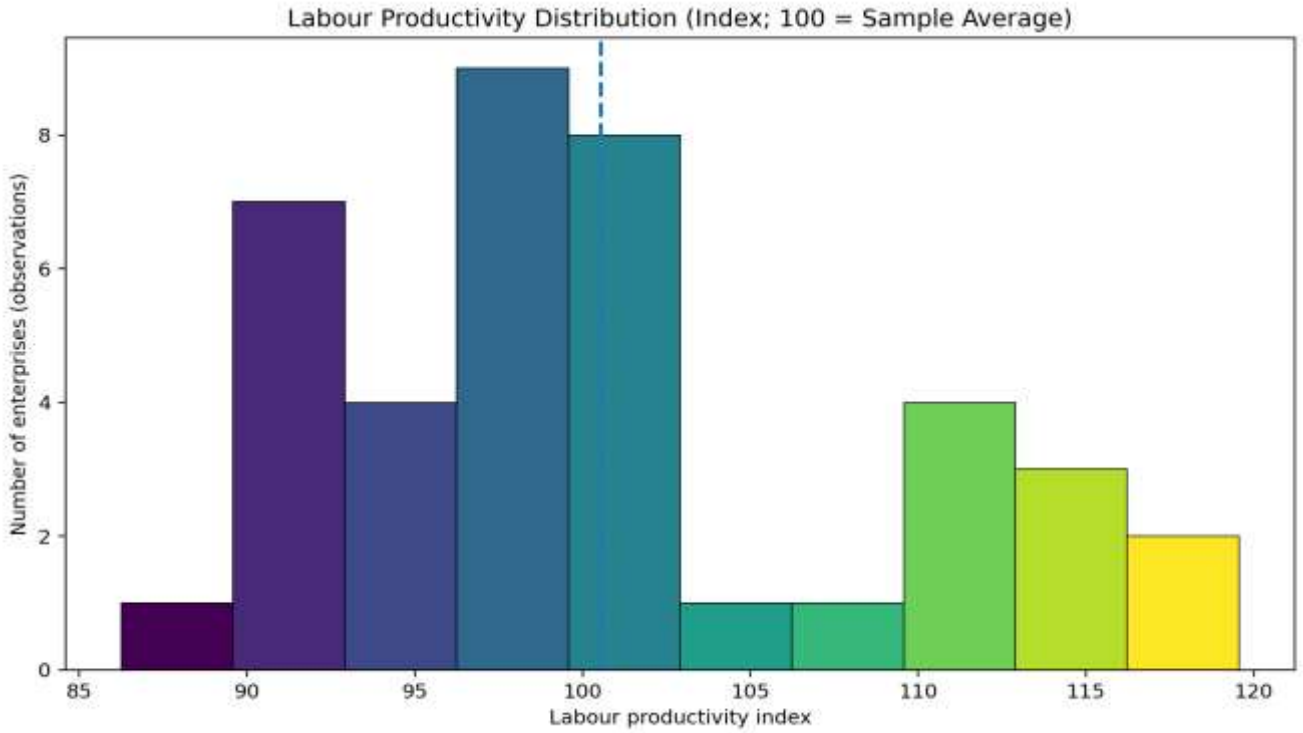


**Figure 1. Labour Productivity Distribution (Index; 100 = Sample Average)[27].**

From the figure above, we can observe that most enterprises are concentrated around the value of 100, meaning the "average productivity" segment dominates the sample. At the same time, the presence of higher values on the right tail (110+) suggests that a smaller group of firms achieves noticeably higher productivity—likely reflecting stronger digital maturity and more effective strategic management practices.

Overall, the findings indicate that digital maturity is a meaningful differentiator of performance in knitwear–garment enterprises. Firms with more integrated digital tools (ERP/MES/CRM and consistent data capture across production, quality, and logistics) demonstrate higher labour productivity, lower defect rates, and shorter lead times compared with low-maturity firms. The descriptive patterns and the productivity distribution (histogram) both suggest that most enterprises operate around the sample average, while a smaller group achieves substantially higher productivity—implying that managerial routines, process discipline, and technology integration can create measurable advantages rather than marginal improvements.

The robust regression results reinforce these observations by quantifying the strongest drivers of productivity. The Digital Maturity Index, training intensity,

[27] Author's development based on statistical data

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and the presence of a KPI/bonus mechanism show positive and statistically significant associations with productivity, whereas defect rates and longer lead times reduce productivity significantly. Taken together, the evidence supports a practical strategic message: digital transformation produces the greatest impact when it is implemented as an end-to-end management system—combining technology, workforce development, quality control, and supply-chain responsiveness—rather than as isolated IT purchases.

**Conclusions and suggestions**

The study concludes that organising strategic management in knitwear and garment enterprises under digital-economy conditions is primarily a question of building an integrated, measurable management system rather than installing isolated IT tools. The empirical patterns and the quantitative assessment jointly indicate that enterprises with higher digital maturity achieve superior operational outcomes, most visibly through higher labour productivity, lower defect rates, and shorter order-fulfilment lead times. The results imply that productivity gaps in the sector are not explained by technology alone, but by the interaction of technology with human capital, process discipline, quality governance, and supply-chain responsiveness. In particular, the robust regression evidence suggests that digital maturity, training intensity, and performance-based incentive mechanisms are positively associated with productivity, while defect rates and longer lead times have a statistically meaningful negative effect. This provides a clear managerial logic: digital transformation creates economic value when it reduces operational uncertainty, strengthens real-time control, and converts data into managerial action that prevents rework, delays, and resource underutilisation. At the same time, the productivity distribution signals heterogeneity across firms: many enterprises remain close to average performance, whereas a smaller set reaches significantly higher productivity, indicating that the sector's main challenge is not the absence of potential, but the uneven diffusion of effective strategic-management practices and digital capabilities. Against the background of global market turbulence, tightening requirements for traceability and compliance, and the structural importance of the textile and garment industry in Uzbekistan's development agenda up to 2030, these findings underline the urgency of moving from ad hoc digitisation to strategic, staged transformation with clearly defined performance targets and accountability.

Based on the findings, several practical recommendations can be formulated for enterprise-level strategy and policy-level support. First, enterprises should adopt a phased digital transformation roadmap that starts with end-to-end data reliability: standardised product master data, digital routing sheets, unified defect coding, and basic warehouse and production reporting are prerequisites for any

advanced analytics or automation. A realistic sequencing approach is recommended: stabilise accounting, inventory, and quality data capture; introduce production dispatching and operational control (e.g., MES elements where feasible); and only then scale forecasting, scenario planning, and advanced KPI dashboards. Second, management should institutionalise data-driven decision routines by linking digital systems to a small set of non-negotiable KPIs that reflect strategic priorities, such as productivity per operator-hour, first-pass yield/defect rate, rework share, on-time-in-full delivery, and lead time by product family. KPIs must be reviewed on a fixed cadence (daily operational meetings and weekly performance reviews) and translated into corrective actions; otherwise, "digitalisation" remains a reporting exercise. Third, human capital development should be treated as a strategic investment with measurable outputs: training plans should focus not only on technical sewing skills, but also on shop-floor digital literacy, basic process control, quality standards, and supervisor-level analytics competence. Training intensity should be tied to operational needs (defect hotspots, bottleneck operations, new product launches) and assessed through performance improvements rather than attendance records. Fourth, enterprises should redesign motivation systems to reinforce desired behaviours: KPI/bonus mechanisms must reward stable quality, reduced rework, adherence to standard times, and delivery reliability, while avoiding perverse incentives that increase output at the expense of defects and returns. Fifth, quality governance should be strengthened through standardisation and traceability: adopting internationally recognised quality frameworks (e.g., ISO-aligned procedures and buyer-specific compliance requirements) should be combined with digital traceability tools that enable root-cause analysis of defects, faster containment actions, and evidence-based dialogue with buyers. Sixth, supply-chain and logistics management should be digitalised with a clear objective to shorten and stabilise lead times: improved planning accuracy, better supplier coordination, and inventory turnover management should be supported by digital visibility, including barcode/RFID where economically justified, and by structured collaboration with logistics partners to reduce variance rather than only average time. Seventh, investment decisions in technology should follow a value-case logic: each digital module or automation step should be justified by quantified savings from reduced downtime, defects, rework, inventory, and expedite costs, and evaluated through conservative and optimistic scenarios to ensure resilience in volatile markets. Finally, at the ecosystem level, the diffusion gap can be narrowed through targeted support mechanisms aligned with Uzbekistan's 2030 priorities: subsidised training programmes for shop-floor supervisors and analysts, shared service centres for SMEs (ERP/MES advisory,

cybersecurity guidance, standardisation support), and export-oriented compliance infrastructure that helps firms meet traceability and due-diligence expectations in key markets. Implemented together, these recommendations provide a practical pathway for knitwear and garment enterprises to convert digitalisation into sustainable competitiveness by improving productivity, reliability, and quality — three outcomes that increasingly determine survival and growth in the contemporary global textile economy.

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