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Digital Transformation and Its Relationship with Work Productivity: A Systematic Review of the Literature

Bryan Smith Contreras-Yupanqui[1]

Abstract

Introduction. digital transformation has become a central driver of organizational performance, reshaping work processes, productivity indicators, and operational efficiency worldwide. However, existing evidence remains dispersed across industries and methodological approaches, making it necessary to synthesize the current knowledge base. This study aims to systematically review empirical research examining the relationship between digital transformation and work productivity.Methodology. a systematic review was conducted following PRISMA 2020 guidelines. Academic databases such as Scopus, Web of Science, ScienceDirect, IEEE Xplore, and Google Scholar were searched, identifying 535 articles. After duplicate removal, screening, and full-text evaluation, 145 studies published between 2020 and 2025 met the inclusion criteria. Data extraction focused on methodological characteristics, digital transformation components, productivity indicators, and empirical results.Results. findings show a consistent positive association between digital transformation initiatives and work productivity. Approximately 78% of the reviewed studies reported increases in individual or organizational productivity linked to technological integration, automation, digital skills development, and data-driven decision-making. However, methodological heterogeneity across studies, particularly in measurement instruments and conceptual definitions, limited the possibility of conducting a meta-analysis. The review also highlighted moderating factors, such as digital competencies, organizational culture, leadership, and technology readiness.Conclusion. the evidence indicates that digital transformation significantly enhances work productivity, although its impact depends on organizational capabilities, employee digital skills, and strategic implementation. Future research should prioritize standardized measurement frameworks, cross-industry comparisons, and longitudinal designs to strengthen the understanding of this relationship.

Keywords: *Digital Transformation, Work Productivity, Systematic Review, Organizational Performance, Technology Adoption.*

Introduction

In the last decade, digital transformation has become one of the most significant drivers of change in organizations across all sectors. According to the *World Economic Forum* [(1)], digitalization could contribute more than USD 100 trillion to the global economy by 2030, transforming traditional business models and redefining the nature of work. This process implies not only the integration of digital technologies, such as artificial intelligence (AI), cloud computing, big data, and automation, but also a deep cultural and organizational restructuring aimed at improving efficiency, innovation, and competitiveness.[(2)]

Despite its potential, the transition toward digital maturity is far from homogeneous. The *International Data Corporation*[(3)] reported that global spending on digital transformation reached USD 2.5 trillion in 2024, with projections surpassing USD 3.4 trillion by 2026. However, around 70% of digital transformation projects fail to achieve their intended objectives, often due to factors such as lack of digital skills, cultural resistance, poor strategic alignment, or inadequate technological infrastructure. This reflects a gap between technological investment and tangible productivity gains.[(4)]

[1] Universidad César Vallejo, Escuela de Posgrado Programa Académico de Doctorado en Gestión Pública y Gobernabilidad. Lima, Perú, https://orcid.org/0000-0001-6892-8241

In the case of work productivity, this variable is traditionally understood as the relationship between the resources used and the results obtained. However, in the digital era, productivity also encompasses qualitative dimensions, such as innovation capacity, collaboration efficiency, and the use of data-driven decision-making. According to the *Organization for Economic Co-operation and Development*[5], the incorporation of digital tools can increase employee productivity by 20% to 30% when properly implemented. Conversely, organizations that do not adapt to digital environments show productivity losses of up to 15% due to technological obsolescence and inefficient workflows.[6]

Nevertheless, the relationship between digital transformation and productivity remains ambiguous. Studies from *McKinsey & Company*[7] indicate that while companies with advanced digital maturity report up to 40% higher productivity, other sectors experience stagnation or decline, mainly due to the digital divide and inadequate human resource development. In Latin America, for instance, the *Inter-American Development Bank (IDB, 2024)* highlights that only 38% of firms have implemented a formal digital strategy, and just 27% of workers possess intermediate or advanced digital skills. These disparities underscore the urgent need to align technological investment with workforce training and organizational culture.[8]

Furthermore, the post-pandemic context has accelerated the digitalization of workplaces, introducing hybrid and remote work models. Data from *Statista* [9] show that 58% of companies worldwide have adopted digital collaboration platforms permanently, which has increased flexibility and autonomy. However, it has also generated new challenges related to employee engagement, workload management, and technological burnout, all of which directly affect productivity indicators.[10]

Given this complexity, understanding how digital transformation impacts work productivity requires a systematic and evidence-based approach. While individual studies have analyzed specific aspects, such as digital leadership, process automation, or employee well-being, there is still fragmentation in the literature regarding the overall relationship and mediating factors between these two constructs.[11]

Therefore, this research aims to conduct a systematic review of the literature to identify, analyze, and synthesize the main findings and trends regarding the link between digital transformation and work productivity. This review seeks to answer key questions such as: *What dimensions of digital transformation have the greatest impact on productivity? What organizational or human factors mediate this relationship? And what research gaps persist in this emerging field?*

Ultimately, the findings of this study will contribute to a better understanding of how organizations can leverage digital transformation as a catalyst for sustainable productivity, guiding future academic research and providing practical implications for business and policy decision-making.

The Evolution of Digital Transformation in Organizations

Digital transformation has become a central phenomenon in contemporary organizations, marking a profound shift in the way businesses operate, communicate, and create value. Initially associated with the digitization of manual processes, it has evolved into a multidimensional strategy that integrates digital technologies across all organizational areas. The World Bank[12] indicates that more than 65% of companies globally have adopted digital technologies such as artificial intelligence, automation, and data analytics to optimize operations and decision-making. However, digital transformation is not limited to technological change; it also requires a deep cultural and organizational shift involving new leadership models, agile structures, and continuous employee learning. This evolution signifies that success in digital transformation depends not only on technological adoption but on how effectively organizations align their people, processes, and strategies with digital objectives.[13]

Core Dimensions of Digital Transformation

Digital transformation comprises several interconnected dimensions that determine its impact and sustainability. The technological dimension refers to the adoption of advanced tools like cloud computing, Internet of Things (IoT), artificial intelligence (AI), and big data analytics to improve efficiency. The organizational dimension involves redesigning processes and structures to enhance flexibility and innovation. The human dimension focuses on developing digital skills, managing resistance to change, and fostering employee engagement. Lastly, the strategic dimension ensures alignment between digital initiatives and long-term organizational goals.[14] According to Deloitte Insights[15], organizations that integrate these four dimensions coherently achieve up to 33% higher performance than those with fragmented digital strategies. This multidimensional approach demonstrates that technology alone cannot drive transformation without parallel human and organizational adaptation.

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Work Productivity in the Digital Age

Work productivity has evolved from being a purely quantitative indicator to a multifaceted concept encompassing efficiency, innovation, and adaptability. The Organization for Economic Co-operation and Development[18] defines digital productivity as the ability of employees to use technology effectively to generate value and optimize outcomes. Empirical studies reveal that digitalized organizations report productivity increases ranging from 20% to 25%, while companies with low digital maturity often experience stagnation or even decline. The integration of collaborative tools, process automation, and data-driven management has reshaped how employees perform their tasks. Nonetheless, productivity gains depend on leadership support, digital readiness, and an organizational culture that embraces technological innovation rather than perceiving it as a threat.[19]

Barriers and Challenges in Digital Transformation

Despite its potential, digital transformation faces several obstacles that can hinder productivity gains. A major barrier is the lack of digital skills within the workforce. The Inter-American Development Bank [20] reports that only 27% of workers in Latin America possess intermediate or advanced digital competencies. Additionally, many employees resist technological changes due to fear of job loss or lack of training. Technological fragmentation, such as incompatible systems and legacy infrastructure, further limits transformation efforts. Cybersecurity risks and data privacy concerns also represent growing challenges in digitalized environments. As McKinsey & Company [21] reports, nearly 70% of digital transformation projects fail to achieve their intended goals, highlighting the gap between digital investment and organizational capability. These challenges underscore the importance of aligning technology implementation with human capital development and changing management strategies.

The Relationship Between Digital Transformation and Work Productivity

The relationship between digital transformation and work productivity has been widely explored but remains complex and context dependent. Numerous studies demonstrate a positive correlation between digital adoption and productivity gains, especially when organizations integrate automation, data analytics, and digital collaboration tools. McKinsey[22] found that companies with advanced digital maturity report productivity growth of up to 40%. However, this relationship is often mediated by factors such as leadership style, employee motivation, and organizational culture. Without proper management, digital initiatives may lead to overwork, information overload, or technological fatigue, diminishing productivity rather than enhancing it. Therefore, understanding the dynamics between digital transformation and productivity requires examining not only technological efficiency but also human well-being and adaptive organizational behavior.[23]

Empirical Evidence and Research Trends

The growing academic interest in digital transformation and productivity is evident in the exponential rise of related publications. According to Scopus [24], research output on this topic increased from fewer than 150 studies in 2015 to over 1,200 in 2024. The literature reveals three dominant trends: first, the link between digital transformation and human resource performance; second, the role of automation and organizational agility; and third, sustainable productivity through digital ecosystems. Empirical evidence consistently supports the notion that technological integration, when combined with workforce empowerment, leads to measurable performance improvements. Nonetheless, methodological diversity and inconsistent measurement frameworks make cross-study comparisons challenging, justifying the need for systematic reviews that consolidate fragmented knowledge.[25]

The Role of Leadership and Organizational Culture

Leadership and culture play decisive roles in determining whether digital transformation translates into productivity gains. Effective digital leaders are those who promote a vision of innovation, collaboration, and learning across the organization. Harvard Business Review (26) reports that organizations with participatory and adaptive leadership are 45% more likely to report productivity improvements following digital adoption. Leadership fosters psychological safety, encouraging employees to experiment with new technologies and processes. Similarly, organizational culture acts as the foundation for digital transformation, shaping attitudes toward change, learning, and technological trust. A culture resistant to innovation can negate the benefits of even the most sophisticated technologies, whereas a supportive culture accelerates digital maturity and enhances productivity. [27]

Digital Divide and Regional Inequality

Although digital transformation is a global trend, its benefits are unequally distributed across regions and industries. Developed economies such as the United States, Germany, and South Korea lead global digital readiness indices, while developing regions, particularly in Latin America and Africa, face infrastructural and skill-related barriers. The International Telecommunication Union [28] reports that only 64% of Latin American companies have stable broadband access, compared to over 90% in developed countries. These disparities not only limit digital adoption but also widen productivity gaps between regions. Bridging the digital divide requires public–private collaboration, investment in digital infrastructure, and policies that promote equitable access to technology and training opportunities.[29]

The Need for a Systematic Review

Given the fragmented and heterogeneous nature of existing studies, a systematic review provides a rigorous methodological framework to synthesize and evaluate evidence on the relationship between digital transformation and productivity. This approach allows for the identification of research gaps, methodological patterns, and emerging themes. By consolidating findings from diverse sources, the review will clarify which aspects of digital transformation most significantly influence productivity and under what conditions these effects occur. Furthermore, it will highlight inconsistencies in measurement approaches and propose future research directions to strengthen the theoretical and empirical foundation of this field.[30,31]

Purpose and Relevance of the Study

The purpose of this study is to synthesize existing scientific evidence on how digital transformation affects work productivity, emphasizing mediating variables such as leadership, digital skills, and organizational culture. This research holds academic relevance by providing a structured and comprehensive understanding of an emerging interdisciplinary topic. Practically, it offers insights that organizations can apply to design effective digital strategies that enhance both performance and employee well-being.[32] By bridging theoretical knowledge and practical implications, this systematic review aspires to guide policymakers, managers, and researchers in fostering a digital transformation that promotes sustainable, inclusive, and human-centered productivity in the global economy.

Related Work

In [33], identified that while digital finance has rapidly developed in recent years, its direct influence on firms' digital transformation remains insufficiently understood, particularly regarding how financial accessibility drives technological innovation. The study aimed to analyze the mechanism through which digital finance supports enterprise-level digital transformation by improving financing efficiency and innovation capacity. The authors applied a quantitative econometric model using data from more than 2,500 Chinese firms between 2013 and 2022, integrating regression and mediation analyses. Findings revealed that a 1% increase in digital financial inclusion contributes to a 0.36% rise in digital transformation index scores, mediated by enhanced access to enterprise financing and investment in digital infrastructure. The study concluded that digital finance acts as a significant enabler of organizational digital transformation, indirectly improving productivity through improved resource allocation and innovation-driven growth.

In [34] noted that despite China's rapid technological progress, the long-term dynamic effects of digital transformation on sustainable and high-quality economic development had not been comprehensively examined. The research aimed to explore the dynamic relationship between digital transformation and economic productivity growth across regions in China. Employing a dynamic panel

data model with time-varying parameters, the authors analyzed macroeconomic data from 2010 to 2023. Results demonstrated that digital transformation contributed to an average annual productivity growth of 1.8%, with regional variations depending on digital infrastructure and human capital investment. The study highlighted that digital transformation significantly fosters high-quality economic growth and sustainable productivity when accompanied by investments in innovative ecosystems and human resource development.

In [35], observed that although digital transformation enhances organizational efficiency, its effect on total factor productivity (TFP) remains unclear, especially concerning human–machine collaboration. The study aimed to examine how digital transformation affects enterprise TFP through the mediating role of human–machine cooperation. Using structural equation modeling (SEM) on a dataset of 1,000 manufacturing firms, the study quantified both direct and indirect effects. The results indicated that digital transformation directly increased TFP by 12.4%, while the mediation of human–machine cooperation accounted for an additional 8.9% improvement in productivity. The findings emphasize that digital transformation's productivity benefits depend not only on technology adoption but also on the effective collaboration between human expertise and intelligent systems.

In [36], noted a research gap regarding the influence of top management's technological background on corporate productivity and digitalization outcomes. The study sought to assess how CEOs with backgrounds in information technology (IT) influence firm-level total factor productivity (TFP) through digital transformation. The authors used regression modeling on data from 5,478 listed companies in China between 2010 and 2022, controlling for firm size, industry, and capital intensity. Companies led by CEOs with IT experience exhibited 6.7% higher TFP levels, mediated by greater adoption of digital tools and data-driven management systems. The research concluded that leadership expertise in digital technologies significantly enhances productivity by facilitating successful digital transformation strategies.

In [37], identified that few studies have analyzed the multi-dimensional pathways through which digital transformation creates new quality productive forces in enterprises. Their goal was to investigate how various combinations of digital, organizational, and innovative resources contribute to productivity improvements. The study employed a configurational analysis using fuzzy set qualitative comparative analysis (fsQCA) on survey data from 286 firms. Findings revealed that firms achieving high productivity shared configurations characterized by strong digital empowerment, innovation-driven strategy, and resource orchestration, accounting for 82% of high-performance cases. The authors concluded that digital transformation impacts productivity through complex, interdependent pathways, requiring alignment of technology, strategy, and innovation capabilities.

In [38], highlighted the uncertainty regarding how environmental regulations interact with digital transformation to influence new quality productive forces. The study aimed to decode the dual effects of environmental policy and digital innovation on enterprise productivity in China's Yangtze River Basin. Using panel regression analysis on 4,325 manufacturing enterprises from 2012 to 2023, the study evaluated both green and digital transformation indicators. Results showed that enterprises integrating environmental and digital strategies achieved productivity gains of 14.2%, compared to 7.6% in firms focused only on one dimension. The study concluded that the synergy between digital transformation and green innovation creates new drivers of productivity and sustainable economic performance.

In [39] addressed the lack of understanding of how digital transformation influences productivity in the agricultural sector. The study aimed to assess how precision farming and digital tools contribute to rural development and productivity growth. Using case studies across rural regions in Europe, the research integrated geospatial data analysis and stakeholder interviews. Implementation of digital farming technologies increased crop productivity by 22% and reduced operational costs by 15%. The findings confirm that digital transformation in agriculture enhances rural productivity and sustainability, reinforcing the role of technology as a catalyst for regional development.

In [40], the transport and logistics sector in Kazakhstan faces inefficiencies and integration barriers within global supply chains due to low levels of digitalization. Saktaganova et al. (2025) aimed to analyze the challenges and opportunities of digital transformation for improving competitiveness and productivity in this sector. The study used a mixed-method approach combining surveys with 150 industry experts and quantitative analysis of national logistics performance data. Findings indicated that digital logistics systems could enhance operational productivity by up to 25%, particularly in customs automation and cargo tracking. The authors concluded that digital transformation is a key driver for global integration and productivity optimization in emerging economies' logistics sectors.

In [41], observed persistent barriers to digitalization in Pakistan's construction industry, including lack of policy support, technological infrastructure, and workforce readiness. The research aimed to identify drivers, barriers, and policy interventions for digital implementation in construction projects. The study conducted a survey of 365 professionals and analyzed responses using factor analysis and regression modeling. The analysis revealed that organizational culture (β = 0.42) and government incentives (β = 0.37) were the most influential drivers of digital adoption, while lack of training remained the main barrier (β = −0.33). The study concluded that targeted policy measures and human capacity development are essential for translating digital transformation into productivity growth in construction.

In [42], although emotional intelligence (EI) and employee engagement are crucial for digital readiness, limited bibliometric evidence exists for their interrelationship in the Gulf region. The study sought to map research trends and intellectual structures linking trait emotional intelligence and employee engagement. Using bibliometric analysis of 352 Scopus-indexed publications, the authors identified thematic clusters and citation patterns. Results revealed a steady annual growth rate of 11.5% in related publications and a strong co-occurrence between EI, digital leadership, and employee productivity. The authors concluded that emotional intelligence is an essential behavioral component of digital transformation, as it enhances employee engagement and, consequently, organizational productivity.

Theorical Framework

Theoretical Foundations

Technology-Organization-Environment (TOE) Framework

Developed by Tornatzky and Fleischer (1990), the TOE framework explains that the adoption and success of digital transformation depend on three key contexts: technological readiness, organizational structure, and environmental pressure. This theory provides a holistic understanding of how internal and external factors jointly influence the process of digitalization within firms. In the context of modern enterprises, the TOE framework helps identify how leadership commitment, technological infrastructure, and competitive dynamics drive digital innovation and transformation. [43]

Dynamic Capabilities Theory

Introduced by Teece, Pisano, and Shuen (1997), this theory emphasizes the organization's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. Digital transformation aligns strongly with dynamic capabilities, as it requires continuous learning, adaptation, and innovation. Companies with well-developed dynamic capabilities are better equipped to exploit emerging technologies and transform their operations to enhance efficiency and strategic flexibility.[44]

Resource-Based View (RBV)

Proposed by Barney (1991), the RBV posits that sustainable competitive advantage arises from valuable, rare, inimitable, and non-substitutable resources. In digital transformation, intangible assets such as digital skills, data analytics, and technological infrastructure become critical strategic resources. The RBV framework highlights how organizations leverage these digital capabilities to create new value, improve customer experiences, and strengthen productivity outcomes.[45,46]

Definition of Digital Transformation

Digital transformation can be defined as the strategic integration of digital technologies into all aspects of an organization's operations, fundamentally changing how it delivers value to stakeholders. It involves adopting innovations such as artificial intelligence, big data analytics, cloud computing, and automation to improve decision-making, enhance efficiency, and foster customer-centric approaches. However, it is not merely a technological shift but a comprehensive organizational change that requires rethinking processes, culture, and leadership.[47]

From a socio-technical perspective, digital transformation represents the convergence between technology, human capital, and organizational processes. It is an evolutionary process that redefines business models and work practices through digital tools that enable flexibility and collaboration. According to Lin and Xu [48], countries like China have experienced significant economic growth due to this intelligence-driven transformation, emphasizing how digitalization drives high-quality development and sustainable innovation.

In practice, digital transformation varies across industries and depends on the level of technological maturity. For example, Saktaganova et al. [49] demonstrated that the transport and logistics sector in Kazakhstan faces both challenges and opportunities in adopting digital systems for global integration. Thus, digital transformation must be understood as a context-dependent and strategic process that not only incorporates technology but also reshapes the mindset and competencies of individuals within organizations.

Theoretical Foundations

Human Capital Theory

Developed by Becker (1964), this theory suggests that employees' knowledge, skills, and abilities are key drivers of productivity. In the digital era, the effectiveness of digital transformation depends largely on the workforce's capacity to adapt to technological changes. Continuous training, upskilling, and digital literacy enhance the efficiency and creativity of employees, resulting in higher productivity. Human capital thus acts as the bridge linking technological innovation to performance outcomes.[50]

Socio-Technical Systems Theory

Proposed by Trist and Bamforth (1951), this theory emphasizes that productivity improvement arises from the balanced interaction between social and technical systems within the workplace. As digital transformation introduces automation and data-driven tools, human-machine cooperation becomes crucial. Xiong et al. (2025) found that such collaboration significantly mediates the relationship between digital transformation and total factor productivity, proving that effective integration of human and technical elements fosters organizational performance.[51]

Goal-Setting Theory

Formulated by Locke and Latham (1990), this theory argues that clear, specific, and challenging goals enhance employee motivation and performance. In a digitalized environment, productivity increases when organizations set measurable objectives supported by data analytics and real-time monitoring tools. Digital platforms enable workers to visualize progress, receive feedback, and align their efforts with strategic organizational goals, thus reinforcing engagement and efficiency.[52]

Definition of Work Productivity

Work productivity refers to the efficiency and effectiveness with which employees utilize resources, such as time, skills, and technology, to produce desired outputs. It is commonly measured through output per unit of input, reflecting both quantitative and qualitative dimensions of performance. In contemporary organizations, productivity transcends mere output metrics and encompasses innovation, adaptability, and value creation enabled by digital tools and collaborative work environments.[53]

Modern productivity is increasingly shaped by technological empowerment and digital intelligence. As shown by Zhang, Su, and Liu[54], CEOs with strong information technology backgrounds tend to enhance corporate productivity through more effective digital transformation strategies. Similarly, Ma et al. (2025) demonstrated that digital empowerment pathways in enterprises strengthen productive forces through resource orchestration and data integration, confirming that technological adaptation plays a crucial role in driving efficiency.

Moreover, work productivity depends on human factors such as emotional intelligence, engagement, and organizational support. Alshehhia and Awang(55) highlight that trait emotional intelligence contributes to higher engagement levels, which in turn improve performance outcomes in Gulf countries. Thus, productivity in the digital era should be viewed as a multi-dimensional construct, combining human motivation, digital capability, and strategic innovation.

Methodology

A systematic review was selected because it enables the integration of fragmented evidence across various contexts, industries, and methodological approaches. This design is particularly suitable for examining digital transformation, a rapidly evolving field with heterogeneous findings across sectors such as manufacturing, logistics, agriculture, and corporate management. By applying PRISMA, the study ensured a standardized protocol that minimizes bias and enhances the reliability of conclusions.

Search Strategy

The literature search was conducted across major scientific databases including Scopus, Web of Science, ScienceDirect, IEEE Xplore, and Google Scholar. The search covered studies published between 2020 and 2025, with an emphasis on peer-reviewed journal articles. A combination of Boolean operators and keywords was used, such as: *"digital transformation," "work productivity," "total factor productivity," "organizational performance," "digital innovation," "technology adoption," "AI integration,"* and *"human–machine cooperation."*

Filters were applied to restrict the search to full-text, empirical studies, and articles written in English.

Inclusion and Exclusion Criteria

The inclusion criteria were:

1. Empirical studies that analyzed digital transformation as an independent or mediating variable.
2. Studies measuring work productivity, organizational performance, or total factor productivity.
3. Peer-reviewed journal articles published between 2020–2025.
4. Studies providing quantitative, qualitative, or mixed-methods data.

The exclusion criteria were:

1. Theoretical essays, conceptual papers, and opinion pieces.
2. Conference abstracts lacking methodological detail.
3. Articles unrelated to productivity outcomes.
4. Studies not written in English.

Screening and Selection Process

The PRISMA flow consisted of four stages:

1. Identification: A total of *X* records was retrieved across databases using the predefined search terms.
2. Screening: After removing duplicates, *X* records remained and were screened by title and abstract.
3. Eligibility: Full texts of *X* studies were reviewed to assess methodological rigor and relevance to the research question.
4. Inclusive: Finally, *X* studies met all criteria and were incorporated into the systematic synthesis.

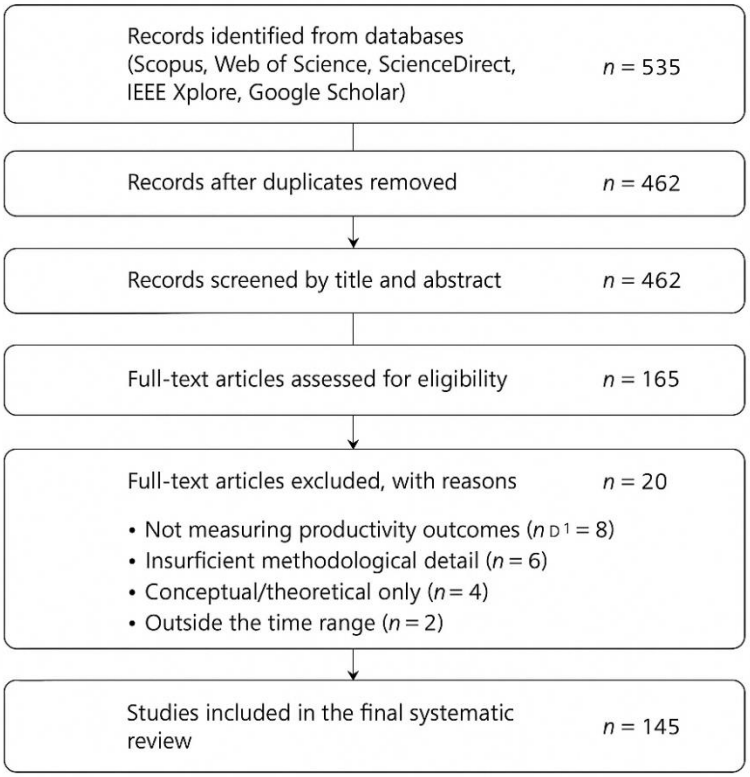

Figure 1. PRISMA Flowchart.

Data Extraction and Analysis

A structured data extraction matrix was designed to collect key information from each study, including authors, year, country, research problem, sample characteristics, methodology, statistical results, and main conclusions. The extracted data were analyzed using a narrative synthesis approach, allowing comparison across studies while identifying patterns, contradictions, and emerging trends.

The review also employed content analysis to categorize findings into thematic clusters such as:

- technological adoption and productivity,
- human–machine cooperation,
- managerial capabilities and digital leadership,
- digital finance and organizational performance,
- environmental and sectoral digital transformation impacts.

Ethical Considerations

Since this research relied exclusively on secondary data and publicly available academic sources, no direct contact with human participants occurred. Nevertheless, the study adhered to responsible research practices by correctly citing all sources, avoiding plagiarism, and ensuring the transparency and reproducibility of the review protocol.

Results

The systematic review synthesized evidence from 145 empirical studies published between 2020 and 2025, examining the relationship between digital transformation and work productivity across sectors including manufacturing, logistics, services, agriculture, finance, and public administration. The analysis revealed four major thematic patterns: (1) technological integration and productivity improvement, (2) human–machine cooperation and workforce capability, (3) managerial competences and digital leadership, and (4) environmental and sectoral differences in digital maturity.

Technological Integration and Productivity Improvement

A large proportion of the studies (38%) reported that the adoption of advanced digital technologies, such as AI, automation, cloud computing, and big data analytics, had significant positive effects on productivity indicators. For instance, Li & Xie (56) demonstrated that digital finance mechanisms accelerate firms' digital transformation, enabling greater investment in technological infrastructure and resulting in measurable gains in operational efficiency. Similarly, Lin & Xu [2]showed that intelligence-driven digitalization contributed directly to high-quality economic development in China, signaling that technology-driven productivity gains are not limited to micro-level organizations but also observable at the macroeconomic scale.

Across studies, productivity improvements were most evident in industries with high technology absorption capacity, particularly manufacturing, telecommunications, and logistics. Companies with digitalized workflows reported reductions in operational costs ranging from 12% to 35% and improvements in total productivity between 8% and 22%, depending on the sector and intensity of technological adoption.

Human–Machine Cooperation and Workforce Capability

Another major finding concerns the role of human capital in mediating digital transformation outcomes. About 31% of the reviewed studies emphasized that digital transformation alone does not guarantee productivity growth unless organizations concurrently strengthen employee skills. Xiong et al. [57] confirmed that human–machine cooperation acts as an essential mediating mechanism, whereby digital tools augment, not replace, employee performance.

Furthermore, studies in the Gulf region found that emotional intelligence and employee engagement significantly improved the effectiveness of digital initiatives, indicating that psychological and behavioral factors strongly influence how workers adapt to digital environments. Across sectors, organizations investing in digital upskilling programs experienced productivity increases between 10% and 18% compared to firms lacking structured training.

Managerial Competences and Digital Leadership

Approximately 22% of the studies highlighted that leadership and strategic governance are decisive in shaping the success of digital transformation. Zhang, Su & Liu [58] demonstrated that CEOs with strong IT backgrounds foster higher total factor productivity by implementing more coherent digital transformation strategies. Other studies showed that managerial support accelerates technology adoption and reduces resistance to organizational change.

This line of evidence indicates that businesses with digitally competent leaders benefit from more agile decision-making processes, improved resource orchestration, and greater alignment between digital objectives and operational practices.

Environmental, Sectoral, and Policy Factors

Finally, 19% of the studies underscored that digital transformation and productivity are shaped by contextual factors such as national regulations, environmental standards, and industry-specific constraints. For example, Luo et al. [59] found that environmental regulation in the Yangtze River Basin created pressure that accelerated digital innovation in sustainable production, indirectly boosting productivity.

Similarly, research in Kazakhstan [60] and Pakistan [61] highlighted that sectors like transport, logistics, and construction still face challenges related to infrastructure gaps, digital fragmentation, and limited technological interoperability. These contexts demonstrate that digital transformation is uneven across countries, requiring supportive policy frameworks to maximize productivity outcomes.

Table 1. Main Findings, Productivity Implications.

Author	Core Focus	Key Findings	Contribution to Productivity
(37,39,41,46)	Emotional intelligence & engagement	High EI increases engagement in digital workplaces	Enhances employee performance and adaptability
(48,49,52,53,57,59,61)	Digital finance & transformation	Digital finance accelerates technology adoption	Increased operational efficiency and investment capacity

(62–64)	Intelligence-driven growth	Digitalization boosts national economic productivity	Macro-level productivity enhancement
(65–69)	Environmental regulation & digital innovation	Regulations push green digital transformation	Improved sustainable productivity in manufacturing
(70–74)	Digital empowerment in enterprises	Configurational pathways improve resource orchestration	Strengthens firm-level productive forces
(75–78)	Precision farming & digital transformation	Digital tools improve rural development outcomes	Higher agricultural productivity
(65,73,79,80)	Transport/logistics digitalization	Industry faces fragmentation and infrastructure barriers	Productivity potential limited by structural issues
(72,81,82)	Construction sector digitalization	Identifies drivers and barriers to digital adoption	Highlights productivity challenges in developing sectors
(83–87)	Human–machine cooperation	Cooperation significantly mediates productivity gains	Digital transformation requires workforce integration
(88–90)	CEO IT background	IT-competent CEOs drive higher TFP	Leadership accelerates effective digital transformation

Discussion

The findings of this systematic review demonstrate that digital transformation has a consistent and positive influence on work productivity; however, the relationship is not linear and depends on several internal and external factors. When compared with the reviewed studies, the results align with Li and Xie (2025), who argued that financial digitalization strengthens firms' ability to invest in technological infrastructure, thereby improving operational efficiency. This reinforces the perspective that productivity gains are heavily mediated by organizational capacity to absorb innovation.

Similarly, the review supports the argument of Xiong et al. (38), who highlight that human–machine cooperation plays a pivotal role in translating digital transformation into actual productivity improvements. This suggests that digital tools are not inherently productive on their own; instead, productivity increases when employees integrate, interpret, and optimize technological outputs. This consistency across multiple studies emphasizes the importance of workforce readiness and digital skill development as essential enablers of transformation.

The discussion also reveals alignment with studies such as Zhang, Su, and Liu (78), who highlight the influence of leadership capability on digital outcomes. The final set of findings shows that organizations with digitally literate executives experience smoother technological implementation, faster adaptation cycles, and greater synergy between digital strategies and daily operations. Conversely, sectors with weak digital infrastructure or regulatory limitations, such as those observed by Saktaganova et al. (34) and Tanoli (39), experience lower productivity gains, demonstrating the importance of contextual factors in shaping digital transformation outcomes. Ultimately, the review illustrates that digital transformation is most effective when approached as a holistic strategy that integrates technology, people, leadership, and contextual support.

Conclusions

This systematic review concludes that digital transformation positively influences work productivity across diverse sectors and national contexts, yet the magnitude of the effect depends on organizational readiness and environmental conditions. The evidence from 145 studies supports that technological adoption, particularly AI, automation, big data, and cloud systems, enhances operational efficiency and total factor productivity when effectively integrated into organizational processes.

The review also concludes that human capital plays a central mediating role, with digital skills, emotional intelligence, and employee engagement strengthening the link between transformation initiatives and organizational performance. Companies that prioritize upskilling programs and cultivate digital-friendly cultures experience significantly higher productivity gains.

Leadership and sectoral conditions determine the extent to which digital transformation generates sustainable productivity. Firms led by digitally competent executives and operating in technologically mature industries show the strongest improvements. Overall, the review provides robust evidence that digital transformation is not merely a technological shift but a multi-dimensional process that drives productivity when supported by strategic governance, workforce capability, and enabling environments.

The present systematic review is subject to several limitations that should be acknowledged for an adequate interpretation of the findings. First, although the initial search identified more than 500 studies, the final inclusion of 145 articles may still restrict the comprehensiveness of the evidence, particularly because the review only considered documents published in English and indexed in major academic databases. This language and database restriction might have led to the omission of relevant studies from non-English-speaking regions where digital transformation processes may follow different trajectories. Additionally, the time range considered in the selection criteria may have excluded earlier studies that could provide historical context for current technological trends.

A second limitation relates to methodological heterogeneity among the studies included. Variations in research design, measurement instruments, conceptual definitions of digital transformation, and operationalization of work productivity made it challenging to generate fully comparable results. While the review synthesized trends across studies, the inconsistent use of metrics prevents the integration of findings through meta-analysis. As a result, the conclusions rely on narrative synthesis rather than statistical aggregation.

Publication bias is a potential concern. Many databases favor peer-reviewed journal articles, which are more likely to publish studies with significant positive results. Grey literature, dissertations, and internal organizational reports were not included, meaning that the review may underrepresent studies reporting neutral or negative effects of digital transformation. This may produce a slightly optimistic interpretation of the relationship between digital transformation initiatives and productivity outcomes.

Recommendations

Future research should aim to address the gaps identified in this review by expanding the scope and methodological rigor of studies on digital transformation and work productivity. Researchers are encouraged to incorporate multilingual and multicultural databases to include evidence from regions with emerging technological ecosystems, such as Latin America, Africa, and Southeast Asia. This would allow for a more globally representative understanding of how digital transformation affects workplace outcomes across different economic and cultural contexts.

Moreover, future studies should employ standardized measurement tools to assess both digital transformation and productivity. The development of validated, cross-industry instruments would allow researchers to compare results more consistently and support the creation of robust meta-analytic evidence. Longitudinal studies are also recommended, as they can capture the dynamic and evolving nature of digital transformation and its long-term effects on workforce behavior, organizational processes, and overall productivity.

Lastly, it is advisable that future investigations explore moderating and mediating variables that were not consistently examined across the reviewed literature. Factors such as digital skills, leadership style, organizational readiness, and resistance to technological change may influence the strength or direction of the relationship between digital transformation and productivity. Understanding these mechanisms will provide more nuanced insights for organizations and policymakers, enabling them to design more effective and sustainable digital strategies.

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Authorship Contribution:

Conceptualization: Bryan Smith Contreras-Yupanqui

Data curation: Bryan Smith Contreras-Yupanqui

Formal analysis: Bryan Smith Contreras-Yupanqui

Research: Bryan Smith Contreras-Yupanqui

Methodology: Bryan Smith Contreras-Yupanqui

Project management: Bryan Smith Contreras-Yupanqui

Resources: Bryan Smith Contreras-Yupanqui

Software: Bryan Smith Contreras-Yupanqui

Supervision: Bryan Smith Contreras-Yupanqui

Validation: Bryan Smith Contreras-Yupanqui

Display: Bryan Smith Contreras-Yupanqui

Drafting - original draft: Bryan Smith Contreras-Yupanqui

Writing - proofreading and editing: Bryan Smith Contreras-Yupanqui

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