ELWAHAT Journal for Research and Studies
Available online at:https://www.asjp.cerist.dz/en/PresentationRevue/2

ISSN : 1112-7163 E-ISSN: 2588-1892 Volume (18)/Issue (2) (2025):752-773

The Socio-Technical Foundations of Digital Transformation in Media Organizations: a Theoretical Framework for Performance Enhancement

Abdelhalim Rekab[1], Wahid Draout [2]

[1]University of Larbi Tebessi, Tebessa, Laboratory of Studies and Digitization and Electronic Information Industry in Libraries, Archives and Documentation, abdelhalim,rekab@univ-tebessa.dz

[2]Studies and Digitization and Electronic Information Industry in Libraries Archives and Documentation, wahid.draout@univ-tebessa.dz

Received: 30-07-2025 Accepted: 10-10-2025 Published**:** 01-12-2025

Abstract:
This study develops a socio-technical framework for digital transformation in media organizations, integrating theoretical insights with empirical barrier research. Drawing upon socio-technical systems design thinking, the framework addresses technological affordances, organizational structures, and social dynamics influencing transformation outcomes. Seven critical barrier dimensions are identified: missing skills, technical constraints, organizational misalignment, cultural resistance, structural mismatch, regulatory restrictions, and market limitations. The framework emphasizes joint optimization of technical and social systems, moving beyond technology-centric solutions. Findings demonstrate that successful digital transformation requires simultaneous consideration of human factors, technological infrastructure, and institutional change processes rather than isolated implementations, providing strategic guidance for media organizations navigating digital disruption.

Keywords: digital transformation, media organizations, socio-technical systems, organizational performance, technological affordances, organizational culture, change management, media industry, systems theory

Corresponding author: Abdelhalim Rekab, abdelhalim.rekab@univ-tebessa.dz

1. Introduction:

The media landscape is undergoing a profound metamorphosis. Once defined by linear broadcasting, print cycles, and editorial gatekeeping, it now operates in an ecosystem shaped by algorithms, real-time analytics, artificial intelligence (AI), and platform-mediated audience engagement. Digital transformation (DT) in media organizations is no longer a strategic option but an existential imperative. Yet, despite significant investments in new technologies from automated content generation to AI-driven personalization many media institutions struggle to achieve sustainable performance improvements. Projects stall, employee burnout rises, and innovation remains incremental rather than transformative.

A critical reason for this persistent gap lies in the dominant approach to digital transformation: one that prioritizes technological adoption over organizational redesign. Too often, DT is treated as an IT upgrade the implementation of a new content management system, the integration of data dashboards, or the deployment of AI tools without addressing the deeper socio-organizational structures in which these technologies are embedded. This techno-centric mindset overlooks a fundamental insight from socio-technical systems (STS) theory: technology and human work systems must be jointly optimized; As Govers and van Amelsvoort argue, digital technologies are not neutral tools; they reconfigure the division of labour, reshape workflows, and redefine professional roles particularly in knowledge-intensive fields like journalism and content creation (Govers, M. J. G., & van Amelsvoort, P, 2023)

This article proposes a paradigm shift. Drawing on the socio-technical systems design (STS-D) tradition particularly the "Lowlands" school that centers the division of labour as a core design lever and integrating empirical insights on the barriers to digital transformation (Brink, H, Packmohr, S, & Paul, F.-H, 2022), we develop a theoretical framework that positions DT in media as a *socio-technical redesign process*, not merely a technological transition. Our central argument is that true performance enhancement in media organizations can only be achieved when digital transformation is approached as a holistic reconfiguration of both technical capabilities and social systems, including work design, organizational culture, skill development, and decision-making structures.

We define *performance* broadly: beyond metrics of speed, reach, or cost-efficiency, it encompasses innovative capacity, employee well-being, editorial integrity, and long-term resilience. The framework we propose identifies how media organizations can navigate the complex interplay

between technological affordances and human constraints by applying STS-D principles such as participatory design, joint optimization, and ambidextrous organizational routines to the challenges of digital transformation.

By synthesizing STS-D theory with contemporary models of DT barriers, this article makes three key contributions. First, it reframes digital transformation in media as a *socio-technical design challenge*, moving beyond the myth of technology-led change. Second, it introduces a revised STS-D sequence adapted for the digital era, integrating design routines such as absurd reverse thinking and agile co-creation (Govers, M. J. G., & van Amelsvoort, P, 2023) Third, it offers a comprehensive, empirically grounded framework that diagnoses common failure points from siloed thinking and skill gaps to algorithmic management and cultural resistance and prescribes actionable pathways for performance enhancement (Brink, H, Packmohr, S, & Paul, F.-H, 2022).

In an age where the boundaries between human creativity and machine intelligence are rapidly blurring, media organizations stand at a crossroads. This article provides a theoretical compass for navigating that terrain one that places people, purpose, and participation at the heart of digital transformation, in line with the vision of a digitally advanced, humane, and innovative organization (Govers, M. J. G., & van Amelsvoort, P, 2023).

2. Problematic and Theoretical Propositions

Despite widespread recognition of the transformative potential of digital technologies, the reality of digital transformation (DT) in media organizations remains fraught with paradoxes. On one hand, DT promises unprecedented capabilities: real-time audience analytics, AI-driven content personalization, automated production workflows, and new revenue models based on data and engagement. On the other hand, empirical evidence suggests that many media institutions fail to realize these benefits, experiencing instead project stagnation, employee resistance, cultural fragmentation, and declining performance (Brink, H, Packmohr, S, & Paul, F.-H, 2022).

This disconnects between technological potential and organizational outcomes constitutes the central problematic of this article.

The problem is not a lack of investment or technical expertise. Rather, it lies in the dominant paradigm of transformation: one that treats DT as a linear, technology-led process, divorced from the social, cultural, and structural realities of media work. As (Brink, H, Packmohr, S, & Paul, F.-H, 2022) demonstrate through their triangulated study, barriers to DT are rarely

purely technical; instead, they cluster around organizational misalignment, cultural resistance, skill gaps, and structural inertia all of which are social in nature. Yet, most transformation initiatives continue to prioritize system integration over human integration, automation over work redesign, and efficiency over quality of working life (Govers, M. J. G., & van Amelsvoort, P, 2023).

This techno-centric bias leads to a critical theoretical and practical contradiction: digital technologies are being implemented in ways that undermine the very human capacities creativity, judgment, trust, and ethical reasoning that define the value of media organizations. Algorithms optimize for clicks, not civic value; automation displaces routine tasks but fails to reconfigure roles for higher-order work; data dashboards monitor performance but erode autonomy. As a result, digital transformation risks becoming a process of de-skilling, surveillance, and alienation, rather than empowerment and innovation (O'Neil, Cathy, 2016) (Karasek, R. A, & Theorell, T., 1990).

This contradiction reveals a fundamental theoretical gap in current DT research: while the socio-technical nature of transformation is often acknowledged in principle, it is rarely operationalized in practice. Existing models either focus on technological affordances (e.g., AI, big data) without addressing organizational design, or they examine change management in isolation from technological specificity (Vial, Understanding digital transformation: A review and a research agenda, 2019). There is, as yet, no integrative theoretical framework that systematically links the affordances and constraints of digital technologies with the principles of socio-technical systems design (STS-D), particularly as adapted to the creative, fast-paced, and public-interest-driven context of media work.

This gap is especially acute when it comes to performance enhancement. Too often, performance is measured narrowly in terms of speed, cost, or reach, neglecting broader dimensions such as employee well-being, editorial quality, and societal impact (Govers, M. J. G., & van Amelsvoort, P, 2023); Without a holistic model that connects technological change to human and organizational outcomes, media leaders lack the tools to navigate transformation in a way that is both effective and humane , To address this gap, this article advances the following core theoretical proposition:

Proposition 1 (P1): Digital transformation in media organizations will fail to achieve sustainable performance enhancement unless it is conceived and enacted as a *socio-technical redesign process*, in which technological

change is jointly optimized with changes in work design, organizational structure, and culture.

This proposition builds on the foundational STS principle of joint optimization (Cherns, 1987), but extends it into the digital era by recognizing that digital technologies are not just tools to be integrated, but active agents in reshaping the division of labour and organizational logic (Govers, M. J. G., & van Amelsvoort, P, 2023), When digital systems are introduced without rethinking roles, workflows, and decision-making authority, they create misalignment, friction, and resistance precisely the barriers identified by (Brink, H, Packmohr, S, & Paul, F.-H, 2022).

Furthermore, we argue that successful socio-technical redesign requires not only structural changes but also deliberate design practices that overcome organizational inertia and stimulate innovation. Drawing on Govers and van Amelsvoort (2023), we propose:

Proposition 2 (P2): The integration of participatory design routines such as absurd reverse thinking, co-creation workshops, and ambidextrous organizing significantly increases the likelihood of successful digital transformation by aligning technological possibilities with human and organizational needs.

Finally, we contend that performance in media must be understood as multidimensional, encompassing not only operational efficiency but also innovation, employee well-being, and societal value. Therefore:

Proposition 3 (P3): A socio-technical approach to digital transformation leads to superior performance outcomes across all dimensions operational, innovative, human-centric, and societal compared to techno-centric models.

These propositions form the theoretical core of the framework developed in this article. They are not derived from empirical testing (as in a quantitative study), but are logically deduced from the synthesis of STS-D theory, empirical findings on DT barriers, and critical analysis of media-specific transformation challenges. As such, they serve as guiding hypotheses for future research and as practical principles for media leaders navigating digital change.

By articulating this problematique and these propositions, this article positions itself at the intersection of three scholarly domains: digital transformation, socio-technical systems theory, and media organizational studies. It contributes to each by offering a unified, actionable framework that re-centers human agency, participatory design, and holistic performance in the discourse on digital futures.

2. Conceptual Foundations: Defining the Core Constructs

To advance a coherent theoretical framework for understanding digital transformation (DT) in media organizations, it is essential to establish clarity around the foundational constructs that underpin the analysis. This section defines and critically examines three interrelated domains: digital transformation, socio-technical systems design (STS-D), and organizational performance. By grounding these constructs in established theory and recent empirical insights, particularly from the socio-technical tradition and contemporary DT research, this section provides the necessary conceptual scaffolding for the integrative model proposed in this article.

3.1 Digital Transformation in Media Organizations: A Socio-Technical Reconceptualization:

Digital transformation has become a central phenomenon in organizational studies, often described as the integration of digital technologies into all areas of business, fundamentally changing how organizations operate and deliver value (Vial, Understanding digital transformation: A review and a research agenda, 2019). While early definitions emphasized technological adoption such as the implementation of cloud computing, artificial intelligence (AI), or data analytics more recent scholarship recognizes that DT involves deep structural, cultural, and strategic reconfigurations (Hess, T., Matt, C., & Benlian, A, 2016). As (Schwab, 2017) argues, DT is a defining feature of the Fourth Industrial Revolution, characterized by the fusion of physical, digital, and biological systems, which blurs traditional boundaries and reshapes industries.

In the context of media organizations, DT extends beyond the mere digitization of content or the migration from print to online platforms. It encompasses a fundamental shift in how news is produced, distributed, and consumed—a transformation driven by algorithmic recommendation systems, real-time audience analytics, automated content generation, and platform-based distribution models (Lepri, B, Staiano, J, Sangokoya, D, Letouzé, E, & Oliver, N, 2017). For instance, AI tools now enable the automatic production of routine news reports (e.g., sports scores, financial updates), while data dashboards allow editors to optimize headlines and story placement based on predicted engagement metrics (O'Neil, Cathy, 2016).

However, despite significant investments in digital infrastructure, many media organizations report limited success in achieving sustainable transformation. A key reason, as (Brink, H, Packmohr, S, & Paul, F.-H, 2022) identify, lies in the persistence of techno-centric approaches that treat

DT as an IT project rather than a holistic organizational change initiative. Their triangulated study reveals that barriers to DT are rarely purely technical; instead, they cluster around organizational misalignment, cultural resistance, structural inertia, and resource constraints. For example, 184 respondents in their dataset cited "sticking to the status quo" as a major cultural barrier, while 54 pointed to a lack of change management as an organizational obstacle.

This evidence underscores a critical theoretical insight: digital transformation is not merely a technological process, but a socio-technical one. As Vial (2019) asserts, successful DT requires the alignment of technological capabilities with organizational structures, leadership practices, and employee competencies. In media, where professional autonomy, editorial judgment, and public accountability are paramount, this alignment becomes even more complex. The introduction of algorithmic systems into editorial workflows, for instance, can enhance efficiency but may also erode journalist agency and undermine public trust if not co-designed with editorial staff (O'Neil, Cathy, 2016).

Therefore, in this article, digital transformation is defined as a *socio-technical reconfiguration* of organizational processes, structures, and cultures through the strategic integration of digital technologies, resulting in fundamental shifts in value creation, work design, and performance outcomes (Brink, H, Packmohr, S, & Paul, F.-H, 2022).This definition moves beyond deterministic views of technology and instead positions DT as a dynamic, relational process in which human and technical systems co-evolve.

3.2. Socio-Technical Systems Design (STS-D): a Framework for Human-Centered Organizational Change:

The socio-technical systems (STS) perspective offers a powerful theoretical lens for analyzing digital transformation, particularly in knowledge-intensive sectors like media. Originating in the mid-20th century with the Tavistock Institute's studies of coal mining and manufacturing, STS theory challenged the classical assumption of technological determinism by asserting that optimal organizational performance can only be achieved through the joint optimization of social (people, roles, culture) and technical (tools, processes, systems) subsystems (Cherns, 1987).

Socio-technical systems design (STS-D) evolved from this theoretical foundation into a practical methodology for organizational renewal. As Govers and van Amelsvoort emphasize, STS-D is not a one-off intervention but a structured, participatory process aimed at creating organizations that

are humane, productive, agile, and innovative. Central to this approach is the division of labour—a core design lever that determines how tasks are allocated between people and machines, how coordination is achieved, and how decision-making authority is distributed (Govers, M. J. G., & van Amelsvoort, P, 2023)

Traditionally, STS-D followed a sequential logic: first define strategic choices, then design the core work system, followed by regulation and technical realization (Govers & van Amelsvoort, 2023). However, in the digital era, this sequence must be adapted to reflect the transformative potential of digital technologies. Govers and van Amelsvoort propose a revised slogan: *"digital thinking inspires vision and organizational design options,"* which inverts the old adage of "first organize, then automate." This new logic acknowledges that digital technologies are not just tools to be integrated, but generative forces that open up new possibilities for business models, work configurations, and value creation (Majchrzak, A., & Markus, M. L, 2014)

The revised STS-D sequence consists of four interrelated steps:

1. Making strategic choices informed by digital affordances and constraints.
2. Designing the core work system, including task allocation and workflow integration.
3. Designing the regulation system, focusing on decentralized control and local decision-making.
4. Realizing digital infrastructures and systems, using agile methods like Scrum sprints (Rossberg, 2019).

Crucially, the first three steps involve deep exploration of digital possibilities *before* technical implementation, ensuring that technology serves human and organizational needs rather than dictating them (Govers, M. J. G., & van Amelsvoort, P, 2023) This approach aligns with the principle of incompletion (Emery, F. E., & Trist, E. L, 1960), which holds that no organizational design is ever final; instead, it must remain open to continuous adaptation and learning.

Moreover, STS-D emphasizes participatory design—the active involvement of workers, managers, and other stakeholders in the transformation process. This stands in contrast to top-down, expert-driven models that often lead to resistance and disengagement. In media organizations, where journalistic independence and creative autonomy are highly valued, participatory design is not merely a best practice but a prerequisite for legitimacy and sustainability (O'Neil, Cathy, 2016).

To overcome conservative inertia and stimulate innovation, Govers and van Amelsvoort introduce new design routines, such as:

- Absurd reverse thinking: asking provocative questions like "What if we removed all digital tools?" to challenge assumptions.
- Ambidextrous organizing: balancing exploitation of current capabilities with exploration of new opportunities (Tushman, M. L., & O'Reilly, C. A, 1996).
- One-fits-one design: moving away from standardized, bureaucratic models toward customized solutions for different work units.

These routines reflect a broader shift in STS-D thinking from stability and control to dynamic adaptation, self-organization, and horizontal coordination which is essential for navigating the volatility of the digital media landscape.

3.3. Organizational Performance in the Digital Media Era: a Multidimensional Construct:

The ultimate goal of digital transformation is performance enhancement. However, what constitutes "performance" in a media organization is itself a contested and evolving concept. Traditional metrics such as circulation, advertising revenue, or cost efficiency remain relevant but are increasingly supplemented by new indicators like audience engagement, content virality, subscriber retention, and data-driven decision-making (Kush R. Varshney, Homa Alemzadeh, 2017).

Yet, a narrow focus on quantitative metrics risks reducing performance to a purely economic outcome, neglecting the qualitative dimensions that are central to the mission of media organizations. These include journalistic quality, editorial independence, public service value, employee well-being, and ethical integrity (Karasek, R. A, & Theorell, T., 1990) Govers and van Amelsvoort argues, the goal of STS-D is not only to increase productivity but to enhance the quality of working life (QWL) and the quality of the organization (QOO)—two interrelated constructs that reflect the human and social outcomes of organizational design.

In media organizations, where creative labor is central, QWL is particularly salient. Journalists and content creators require autonomy, meaningful work, and opportunities for professional growth—conditions that can be undermined by algorithmic management, constant monitoring, and pressure to produce click-driven content (Brink, H, Packmohr, S, & Paul, F.-H, 2022) (O'Neil, Cathy, 2016). Burnout, moral injury, and turnover are common in digital newsrooms where the pace of work has accelerated without corresponding support structures.

Furthermore, performance must be understood as sustainable and resilient, not just efficient. A media outlet that achieves high traffic through sensationalism may perform well on certain metrics but fail in its broader societal role. Conversely, an organization that invests in investigative journalism, diversity of voices, and long-form storytelling may have lower immediate returns but greater long-term legitimacy and impact.

Drawing on the balanced scorecard and triple bottom line frameworks, we conceptualize performance in media organizations as comprising four interdependent dimensions:

1. Operational Performance: Efficiency, speed, accuracy, and scalability of content production and distribution.
2. Innovative Performance: Capacity to experiment with new formats (e.g., podcasts, interactive storytelling), business models (e.g., memberships), and technologies (e.g., AI, VR).
3. Human-Centric Performance: Employee satisfaction, skill development, work-life balance, and psychological safety.
4. Societal Performance: Public trust, democratic accountability, diversity of perspectives, and contribution to informed citizenship.

4. The Evolving Nature of Work in Media: A Socio-Technical Perspective:

The process of digital transformation in media organizations is not merely a technological upgrade; it is a fundamental reconfiguration of the very nature of work. As digital technologies become deeply embedded in editorial workflows, content distribution, and audience engagement, they alter the division of labor, redefine professional roles, and reshape the quality of working life (QWL) for journalists, editors, and production staff. Drawing on the socio-technical systems design (STS-D) framework, particularly the model of technology penetration into the nature of work proposed by Govers and van Amelsvoort, this section examines how digital tools are transforming media work from a human-centric craft into a hybrid system of human-machine collaboration. It argues that without a deliberate socio-technical redesign of work systems, these transformations risk undermining the creative, ethical, and democratic functions of media.

4.1. The Penetration of Digital Technology into Media Work:

Govers and van Amelsvoort (2023) propose a model that conceptualizes the impact of digital technology on work through four distinct roles that technology can assume: assist, substitute, manage, and organize/control. This model provides a powerful analytical lens for understanding the

progressive encroachment of digital systems into journalistic and editorial processes.

- Assist: In this role, digital technology supports human workers by enhancing their capabilities. Examples in media include transcription software (e.g., Otter.ai), grammar and style checkers (e.g., Grammarly), and data visualization tools (e.g., Tableau). These tools reduce cognitive load and increase efficiency but leave editorial judgment and creative control firmly in human hands.
- Substitute: Here, technology takes over tasks that were previously performed by humans. In media, this is most evident in the rise of automated journalism (or "robot-journalism"), where AI algorithms generate news reports on routine topics such as sports scores, financial earnings, or weather updates (Kush R. Varshney, Homa Alemzadeh, 2017). The Associated Press, for instance, uses AI to produce thousands of quarterly earnings reports annually, freeing journalists for more complex investigative work (Davenport, T. H., & Ronanki, R, 2018). While substitution can increase output and reduce costs, it also raises concerns about deskilling and the erosion of professional identity.
- Manage: In this role, digital systems begin to exert control over human workers. Workflow management platforms (e.g., Asana, Trello), content scheduling tools (e.g., Hootsuite, Buffer), and performance dashboards that track clicks, shares, and time-on-page are all examples of managerial technologies. These systems monitor productivity, assign tasks, and set deadlines, often without human intervention. As Govers and van Amelsvoort noted, this role represents a shift from human-led coordination to algorithmic management, which can lead to increased surveillance and pressure.
- Organize/Control: At the highest level of penetration, digital technology assumes responsibility for structuring the entire work system. This includes algorithmic curation of news feeds (e.g., Facebook's News Feed, Google News), AI-driven editorial calendars that prioritize content based on predicted engagement, and platform-based distribution models that dictate visibility and monetization. In this role, the technology is no longer just a tool or a manager but a regulatory system that shapes organizational logic and strategic direction (Govers, M. J. G., & van Amelsvoort, P, 2023).

Projected onto the media context, this model reveals a critical insight: repetitive and data-driven tasks are most susceptible to substitution and management by algorithms, while explorative and investigative work—which require creativity, ethical judgment, and contextual understanding—

remain more resistant. However, even these higher-order tasks are increasingly influenced by algorithmic signals, as journalists are incentivized to produce "clickable" content based on audience analytics (O'Neil, Cathy, 2016).

4.2. The Division of Labor in the Digital Newsroom:

A central concept in STS-D theory is the division of labor, which refers to how tasks, responsibilities, and decision-making authority are distributed within an organization (Govers, M. J. G., & van Amelsvoort, P, 2023). Traditionally, media organizations operated with a clear hierarchical division: reporters gathered information, editors curated and verified content, producers managed publication schedules, and managers oversaw strategy and budgets. Digital transformation has disrupted this model, blurred professional boundaries and created new hybrid roles.

The integration of digital technologies has led to the emergence of new job functions such as data journalists, audience engagement editors, social media curators, and AI trainers. These roles reflect a shift from a functional, department-based structure to a more fluid, project-based organization. However, this shift is not always accompanied by a corresponding redesign of workflows, authority, or accountability. As (Brink, H, Packmohr, S, & Paul, F.-H, 2022) identify, organizational misalignment such as a lack of a clear digital transformation roadmap or immature decision-making processes is a major barrier to successful DT. In many newsrooms, data journalists may produce insightful analytics, but editors may lack the authority or training to act on them, leading to a disconnect between insight and action.

Moreover, the division of labor is increasingly being reshaped by algorithmic logic. For example, recommendation algorithms on platforms like YouTube or TikTok prioritize content that maximizes user engagement, which in turn influences editorial decisions. Journalists may find themselves producing more sensational or emotionally charged content not because of editorial judgment, but because the algorithm rewards it. This represents a form of algorithmic regulation, where the technical system indirectly controls the social system (Govers, M. J. G., & van Amelsvoort, P, 2023).

To prevent such misalignments, STS-D advocates for a deliberate redesign of the division of labour that anticipates the impact of digital technologies. This involves asking critical questions: *Which tasks should be automated? Which decisions should remain human? How can new roles be integrated into existing workflows?* As Govers and van Amelsvoort argued, the design of the core work system must precede the realization of digital infrastructures not the other way around.

4.3. Quality of Working Life in the Digital Media Era:

The quality of working life (QWL) is a core concern in socio-technical systems theory, reflecting the extent to which work is meaningful, autonomous, and supportive of personal well-being (Karasek & Theorell, 1990). In media organizations, where professional autonomy and creative fulfillment are central to job satisfaction, digital transformation poses both opportunities and risks for QWL.

On one hand, digital tools can enhance QWL by reducing routine burdens, enabling remote collaboration, and providing real-time feedback from audiences. Journalists can use AI to automate transcription, allowing them to focus on storytelling and investigation. Cloud-based platforms enable distributed teams to collaborate seamlessly, increasing flexibility and work-life balance.

On the other hand, the same technologies can undermine QWL by increasing work intensity, eroding autonomy, and fostering a culture of constant surveillance. The 24/7 news cycle, amplified by social media, creates relentless pressure to produce content quickly. Performance dashboards that track metrics like page views, time-on-site, and bounce rates can lead to metric-driven anxiety, where journalists feel judged not by the quality of their work but by its virality (O'Neil, Cathy, 2016). This aligns with (Karasek, R. A, & Theorell, T., 1990) Job Demand-Control model, which posits that high job demands combined with low decision latitude led to high strain and burnout.

Furthermore, the cultural and structural barriers identified by (Brink, H, Packmohr, S, & Paul, F.-H, 2022) such as "sticking to the status quo" (184 mentions), "diffuse fears and insecurities" (69), and "silo thinking" (20) exacerbate these challenges. When digital transformation is imposed top-down without employee involvement, it fosters resistance and disengagement. Conversely, a participatory design approach where journalists, editors, and tech staff co-create new workflows can enhance QWL by fostering ownership, transparency, and trust (Govers, M. J. G., & van Amelsvoort, P, 2023)

In sum, the evolving nature of work in media is not predetermined by technology but shaped by organizational choices. A socio-technical perspective compels media leaders to move beyond a narrow focus on efficiency and instead consider how digital transformation affects the human experience of work. Only by designing for both technical performance and human well-being can media organizations achieve sustainable and ethical digital transformation.

5. Barriers to Digital Transformation in Media: a Socio-Technical Diagnosis:

Digital transformation (DT) in media organizations is not merely a technical challenge; it is a deeply embedded in socio-technical process fraught with systemic barriers that hinder successful implementation and sustainable performance enhancement. While the potential of digital technologies such as artificial intelligence, data analytics, and automated content systems is widely acknowledged, the reality for many media institutions is one of stalled projects, fragmented adoption, and employee resistance. To understand why so many DT initiatives fail to deliver on their promises, it is essential to move beyond a techno-centric lens and adopt a socio-technical diagnostic approach that systematically identifies and categorizes the multifaceted barriers to change.

This section draws directly on the triangulated barrier model developed by (Brink, H, Packmohr, S, & Paul, F.-H, 2022), who conducted a rigorous, data-driven study combining semi-structured interviews with 20 participants and a survey of 340 respondents to identify the most prevalent obstacles to digital transformation. Their research, which applies a socio-technical systems (STS) perspective, reveals that barriers are not isolated incidents but clustered within interrelated dimensions that reflect both the technical infrastructure and the social fabric of organizations. By applying this model to the specific context of media organizations where creativity, editorial autonomy, and public trust are paramount we can develop a precise diagnosis of the structural, cultural, and operational impediments to effective transformation.

5.1. A Socio-Technical Model of Barriers to Digital Transformation:

(Brink, H, Packmohr, S, & Paul, F.-H, 2022) propose a five-dimensional socio-technical model of DT barriers, derived from their triangulated data collection. This model provides a comprehensive framework for diagnosing failure points in transformation processes. The dimensions are: technical barriers, organizational misalignment, cultural resistance, missing skills, and resource constraints. Each dimension contains specific characteristics that manifest in observable organizational behaviors and outcomes.

When applied to media organizations, this model reveals how digital transformation is often undermined not by a lack of technology, but by misalignment between digital tools and human systems. For instance, the introduction of AI-driven analytics platforms may be technically sound, but if journalists lack the data literacy to interpret the outputs, or if editorial leaders fail to integrate insights into decision-making, the tool becomes

ineffective. The following analysis maps each barrier dimension onto the media context, using empirical evidence from the study and its underlying theoretical foundations.

5.1.1. Technical Barriers: the Limits of Infrastructure:

Technical barriers refer to deficiencies in the digital infrastructure that prevent the smooth implementation of new systems. According to (Brink, H, Packmohr, S, & Paul, F.-H, 2022), the most frequently cited technical barrier is deficient IT infrastructure (153 mentions), followed by security issues (27) and isolated systems (29). In media organizations, this often translates into legacy content management systems (CMS) that cannot integrate with modern data analytics tools, or fragmented digital ecosystems where audience data is siloed across platforms (e.g., website, social media, email).

These technical limitations are not merely operational inconveniences; they have profound socio-technical implications, isolated systems prevent holistic data-driven decision-making, forcing teams to work with incomplete or outdated information. Moreover, concerns about security issues such as data breaches or unauthorized access to sensitive sources are particularly acute in journalism, where source protection is a core ethical principle.

The study also identifies missing technical support (16 mentions) as a newly emerged barrier, reflecting the gap between deploying a digital tool and ensuring its ongoing maintenance and user assistance. In media newsrooms, where technical expertise is often concentrated in a small IT team, the absence of dedicated support can lead to low adoption rates and frustration among editorial staff.

This dimension aligns with broader research on IT-enabled change, which emphasizes that digital artifacts now mediate socio-technical structures previously managed through human interaction or non-digital tools (Brink, H, Packmohr, S, & Paul, F.-H, 2022) (Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Blegind Jensen, T). In media, this means that algorithms, dashboards, and AI systems are not just tools but active mediators of editorial judgment and organizational coordination.

5.1.2. Organizational Misalignment: the Absence of Strategic Coherence:

Organizational misalignment refers to structural and strategic deficiencies that prevent coordinated action. The most prominent barrier in this category is the lack of a clear digital transformation roadmap (63 mentions), which leaves teams without a shared vision or direction. In media organizations, this often results in ad hoc technology adoption such as

implementing a chatbot or launching a podcast channel without a coherent strategy for how these initiatives contribute to broader organizational goals.

Another key finding is immature decision-making processes (31 mentions), which reflects a lack of clarity in authority, accountability, and prioritization. In newsrooms, this can manifest as conflicts between editorial and commercial departments, or between journalists and data teams, over content strategy. Without mature governance structures, digital initiatives remain fragmented and under-resourced.

Brink also highlight unclear responsibilities (31 mentions) and lack of coordination (20) as significant obstacles. In media, where cross-functional collaboration is essential (e.g., between reporters, editors, designers, and developers), the absence of clearly defined roles can lead to duplication of effort, missed deadlines, and project failure (Brink, H, Packmohr, S, & Paul, F.-H, 2022).

This barrier is consistent with foundational STS theory, which emphasizes the need for joint optimization of social and technical systems Cherns, 1987, cited in (Govers, M. J. G., & van Amelsvoort, P, 2023). When digital tools are introduced without redesigning workflows and decision rights, the result is sub-optimization where technology performs well in isolation, but the overall system fails.

5.1.3. Cultural Resistance: the Human Side of Inertia:

Cultural resistance is perhaps the most pervasive and difficult-to-address category of barriers. Brink identify sticking to the status quo as a major cultural obstacle, mentioned by 184 respondents. This resistance is rooted in a deep-seated preference for familiar routines and a fear of the unknown. In media organizations, where professional identity is closely tied to traditional forms of storytelling and editorial judgment, the introduction of algorithmic systems can be perceived as a threat to journalistic autonomy.

Related to this is the lack of change management (54 mentions), which indicates that organizations often fail to prepare employees for transformation. Without effective communication, training, and psychological support, staff may feel excluded from the process, leading to disengagement and passive resistance.

The study also identifies diffuse fears and insecurities (69 mentions), including concerns about job loss due to automation. In the context of media, where newsroom layoffs have been widespread over the past two decades, the introduction of AI tools for automated reporting or content curation can exacerbate anxiety, even when the intent is to free journalists for higher-value work.

This cultural inertia resonates with Sydow's (1985) critique of traditional socio-technical approaches, which calls for a deeper understanding of how organizational culture shapes the reception of technological change (Brink, H, Packmohr, S, & Paul, F.-H, 2022) It also echoes Trist and Bamforth's (1951) seminal study on coal mining, which showed that technological change without social adaptation leads to alienation and reduced performance.

5.1.4. Missing Skills: the Competency Gap

The dimension of missing skills captures the gap between the competencies required for digital transformation and those available within the organization. (Brink, H, Packmohr, S, & Paul, F.-H, 2022) identify several sub-barriers, including missing organizational knowledge (27), missing DT potential knowledge (26), missing implementation knowledge (21), and missing user technology knowledge (34).

In media organizations, this manifests as a lack of data literacy among journalists, editors, and managers. While reporters may be skilled storytellers, they often lack the ability to interpret audience analytics, design A/B tests, or collaborate effectively with data scientists. Conversely, technical staff may lack an understanding of journalistic values, leading to misaligned tool design.

A critical new finding from the study is insufficient training and learning (115 mentions), which emerges as the most significant sub-barrier in this category. This highlights a systemic failure to invest in continuous learning and upskilling. In fast-evolving digital environments, one-off training sessions are inadequate; organizations need embedded learning cultures that support ongoing adaptation.

This finding aligns with the STS-D principle of participatory design, which emphasizes that workers must be actively involved in learning and shaping new technologies (Govers, M. J. G., & van Amelsvoort, P, 2023). As (Malone, 2022) notes cited digital technology can play four roles in human work: tool, substitute, manager, and organizer. For workers to adapt, they must understand not just how to use a tool, but how their role is being redefined by it.

5.1.5. Resource Constraints: the Limits of Capacity

Finally, resource constraints reflect the practical limitations of time, budget, and personnel. (Brink, H, Packmohr, S, & Paul, F.-H, 2022) identify lack of financial resources (129 mentions) and lack of personnel resources (106) as major impediments. In media organizations, especially public

service or local outlets, financial pressures often mean that digital transformation is treated as a side project rather than a strategic priority.

The lack of qualified personnel (34 mentions) is another critical constraint. Media organizations may lack in-house expertise in AI, UX design, or platform strategy, forcing them to rely on external consultants a solution that can lead to dependency and misalignment with internal needs.

This dimension reflects a broader challenge in organizational renewal: the tension between exploitation of current capabilities and exploration of new ones (Govers, M. J. G., & van Amelsvoort, P, 2023). Without sufficient resources, media organizations struggle to balance daily operations with long-term innovation.

5. Addressing the Problematic and Conclusion:

This article has addressed a central problematic: despite significant investments in digital technologies, many media organizations fail to achieve sustainable performance enhancement through digital transformation (DT). The root cause, as demonstrated throughout this paper, is not technological deficiency but a fundamental misalignment between digital tools and human systems. The dominant paradigm treats DT as a technical upgrade the implementation of AI, data dashboards, or new content management systems while neglecting the socio-organizational redesign required to make these tools effective, meaningful, and humane. Drawing on the socio-technical systems design (STS-D) tradition and the empirically grounded barrier model of Brink, Packmohr, and Paul (2022), this article has proposed a theoretical framework that repositions DT in media as a socio-technical redesign process, not merely a technological transition.

The problematic is clearly articulated in the findings of Brink (2022), whose triangulated study of 525 respondents across multiple sectors reveals that the most significant barriers to DT are not technical, but social, cultural, and organizational. Their data show that *"sticking to the status quo"* was mentioned in 184 cases, *"diffuse fears and insecurities"* in 69, and *"lack of change management"* in 54. These findings confirm that resistance to transformation is deeply embedded in organizational inertia, conservative thinking, and fear of job loss — issues that cannot be resolved by technology alone.

Moreover, the study identifies "insufficient training and learning" (115 mentions) and "missing user technology knowledge" (34) as critical skill gaps, underscoring the need for continuous learning and participatory design. In media organizations, where journalists and editors are expected to adapt

to algorithmic curation, data-driven storytelling, and platform-based distribution, the absence of adequate training leads to disengagement, misinterpretation of tools, and ultimately, failed adoption.

This analysis directly supports Proposition 1: that digital transformation in media organizations will fail to achieve sustainable performance enhancement unless it is conceived and enacted as a *socio-technical redesign process*. The evidence from (Brink, H, Packmohr, S, & Paul, F.-H, 2022) shows that technical barriers like *"deficient IT infrastructure"* (153 mentions) or *"isolated systems"* (29) are often symptoms of deeper organizational misalignment — such as *"lacking DT roadmap"* (63) or *"immature decision-making"* (31). These dysfunctions echo the classic STS critique of bureaucratic organizations that respond to complexity by tightening control, thereby deepening the very problems they aim to solve (Govers, M. J. G., & van Amelsvoort, P, 2023).

To overcome this, the article has proposed a revised STS-D sequence adapted for the digital era, inspired by (Govers, M. J. G., & van Amelsvoort, P, 2023). This sequence inverts the traditional logic: instead of "first organize, then automate," it begins with *"digital thinking inspires vision and organizational design options."* This shift acknowledges that digital technologies are not neutral tools, but active agents of change that open up new possibilities for business models, work configurations, and value creation. The four-step sequence (1) strategic choices, (2) core work system design, (3) regulation system design, and (4) digital system realization ensures that technology follows organizational design, not the other way around.

Central to this framework is the division of labor as the key design lever. By organizing work around *"homogeneous customer families"* and creating *"parallel work units"*, media organizations can reduce complexity, enable self-organization, and foster horizontal coordination. For example, a newsroom could form autonomous teams for investigative journalism, data storytelling, and social media engagement each managing its own workflow from ideation to publication. This structure supports agility, innovation, and employee involvement all of which are undermined in traditional, siloed newsrooms.

To counteract conservative inertia, the framework integrates design routines such as absurd reverse thinking (Govers, M. J. G., & van Amelsvoort, P, 2023) which challenges assumptions by asking: *"What if we removed all digital tools?"* or *"What if algorithms decided all headlines?"* This routine helps organizations break free from path dependency and

explore radically different futures. It also supports Proposition 2: that participatory design routines significantly increase the likelihood of successful DT by aligning technological possibilities with human and organizational needs.

Furthermore, the framework embraces the ambidextrous approach (Trist, E. L., & Bamforth, K. W, 1951), balancing *exploitation* of current capabilities with *exploration* of new opportunities. In media, this means maintaining core journalistic functions while experimenting with AI-assisted reporting, blockchain-based verification, or immersive storytelling. This duality is essential for resilience in a volatile digital environment.

Finally, the article affirms Proposition 3: that a socio-technical approach leads to superior performance across operational, innovative, human-centric, and societal dimensions. Unlike techno-centric models that measure success solely by clicks or cost savings, this framework values quality of working life (QWL), employee well-being, and public trust — principles rooted in the original STS vision of (Trist, E. L., & Bamforth, K. W, 1951) who showed that technological change without social adaptation leads to alienation and reduced performance.

In conclusion, digital transformation in media organizations cannot succeed if it remains a technology project. It must become a socio-technical design challenge, where digital tools are integrated into a reimagined work system that prioritizes human agency, creativity, and ethical responsibility. The theoretical framework proposed in this article — grounded in STS-D principles and empirically validated barrier research — provides a roadmap for achieving this transformation. It calls for a shift from top-down, deterministic models to participatory, adaptive, and human-centered approaches that honor both the potential of digital technology and the irreplaceable value of human judgment in journalism.

References

Brink, H, Packmohr, S, & Paul, F.-H. (2022). Extending a socio-technical model of the barriers to digital transformation through data triangulation. *Proceedings of the IEEE International Conference on Industrial Engineering and Engineering Management (ICIM).*, (pp. 17-21). Retrieved from https://doi.org/10.1109/ICIM56520.2022.00020

Cherns, A. (1987). The principles of socio-technical design revisited. *3*, pp. 153-161. Retrieved from https://doi.org/10.1177/001872678704000303

Davenport, T. H., & Ronanki, R. (2018, January). Artificial intelligence for the real world. pp. 110-115.

Emery, F. E., & Trist, E. L. (1960). Socio-technical systems. In F. E. Emery (Ed.). pp. 21-37.

Govers, M. J. G., & van Amelsvoort, P. (2023). A theoretical essay on socio-technical systems design thinking in the era of digital transformation. *36*(1), pp. 27-46. Retrieved from https://doi.org/10.1109/ICIM56520.2022.00020

Hess, T., Matt, C., & Benlian, A. (2016). Options for formulating a digital transformation strategy. *2*, pp. 123-139.

Karasek, R. A, & Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. basic Books.

Kush R. Varshney, Homa Alemzadeh. (2017, 9 1). On the Safety of Machine Learning: Cyber-Physical Systems, Decision Sciences, and Data Products. *5*(3). Retrieved from https://doi.org/10.1089/big.2016.0051

Lepri, B, Staiano, J, Sangokoya, D, Letouzé, E, & Oliver, N. (2017). The tyranny of data? The good, the bad, and the ugly of data-driven decision-making in development and humanitarian contexts. *5*(2), pp. 144-150. Retrieved from https://doi.org/10.1089/big.2016.0051

Majchrzak, A. &. (2014). Technology affordances and constraints in management. pp. 589-611.

Majchrzak, A., & Markus, M. L. (2014). Technology affordances and constraints in management. pp. 589-611.

Malone, T. W. (2022). The future of work: How the new order of business will shape your organization. pp. 13-24.

O'Neil, Cathy. (2016). *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy.* New York: Crown Publishers.

Rossberg, J. (2019). *Agile Project Management with Azure DevOps: Concepts, Templates, and Metrics.* Apress. Retrieved from https://doi.org/10.1007/978-1-4842-4221-6_3

Schwab, K. (2017). *The fourth industrial revolution. Cr.* New York: Currency Books.

Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the longwall method of coal-getting: An examination of the psychological situation and defences of a work group in relation to the social structure and technological content of the work system. *4*(1), pp. 3–38. Retrieved from https://doi.org/10.1177/001872675100400101

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous organizations: Managing evolutionary and revolutionary change. . *38*(4), pp. 8-30.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *28*(2), pp. 118-144.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, *28*(2), 118-144.

Wessel, L., Baiyere, A., Ologeanu-Taddei, R., Cha, J., & Blegind Jensen, T. (n.d.). Unpacking the difference between digital transformation and IT-enabled organizational transformation. . *22*(1), pp. 102–129.