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Article

Spatial Restructuring of News Production in the Intelligent Media Era: A Socio-Temporal Perspective on the Newsroom

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Abstract: The advent of the intelligent media era has fundamentally transformed the traditional newsroom, evolving it from a localized physical entity into a decentralized, fluid network. This research investigates the spatial restructuring of news production through the analytical lens of socio-temporal sociology, exploring how technologies such as artificial intelligence, machine learning, and algorithmic logic redefine the conceptual and physical "place" of journalism. By synthesizing Henri Lefebvre's "production of space" with Anthony Giddens' "time-space distanciation" and David Harvey's "time-space compression," this study argues that the modern newsroom has transitioned from a static "space of places" to a dynamic "space of flows." The analysis reveals that intelligent mediation facilitates a radical "de-territorialization" of editorial work, where the rigid boundaries between the field and the office dissolve entirely. Simultaneously, the algorithmic pursuit of "real-time" production imposes a new temporal tyranny, accelerating the news cycle to the point of instantaneousness and fundamentally reshaping the professional identity and daily routines of journalists. Ultimately, this thesis highlights that the reconstruction of the newsroom is not merely a technical shift but a profound reorganization of social relations, labor structures, and power dynamics within the media industry. While significantly enhancing operational efficiency and global reach, this restructuring poses significant challenges to the traditional "sense of place" and collective ritualism that have long anchored the journalistic profession, necessitating a critical reevaluation of modern editorial practices.

Keywords: spatial restructuring; newsroom; sociology; intelligent media; time-space compression

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1. Introduction

In the contemporary landscape of global communication, the concept of the "newsroom" is undergoing a profound ontological shift. Historically defined by its physical walls, the rhythmic clatter of typewriters, and the dense concentration of human capital in a centralized geographic coordinate, the newsroom functioned as the "beating heart" of journalism. However, the advent of the intelligent media era, characterized by artificial intelligence, algorithmic automation, and ubiquitous connectivity, has fundamentally dismantled these traditional boundaries [1]. Today, news production is no longer tethered to a static office; instead, it has morphed into a decentralized, fluid, and multi-nodal process. This transformation necessitates a rigorous academic inquiry that moves beyond mere technological descriptions, seeking instead to understand how the very fabric of social time and space is being rewoven.

The central premise of this study is that the "intelligitization" of media is not merely a technical upgrade but a catalyst for the spatial restructuring of journalism. From a socio-temporal perspective, space is not a vacuum containing social actions, but a social product

in itself. In the era of intelligent media, the introduction of algorithmic logic and cloud-based infrastructures has facilitated what is termed "time-space distancing," the "lifting out" of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space. When a journalist in London uses AI-driven tools to curate data from Tokyo and publish to a global audience in real-time, the traditional "sense of place" associated with the newsroom evaporates. The newsroom becomes a "space of flows" rather than a "space of places," where the velocity of information overrides the friction of distance.

Furthermore, this spatial restructuring is inextricably linked to a radical reshaping of temporal orders. The concept of "time-space compression" provides a critical lens to examine how intelligent technologies have accelerated the news cycle to the point of "instantaneousness." The algorithmic imperative for "real-time" reporting creates a new form of temporal tyranny, where the gap between an event occurring and its mediated representation shrinks toward zero [2]. This collapse of time inevitably recoils upon space: when production must be constant and immediate, the physical newsroom as a site of deliberate editorial reflection is superseded by a distributed, "always-on" network. Consequently, the professional identity of journalists, the power dynamics between human editors and algorithmic systems, and the ritualistic nature of news work are all being reconfigured within this new socio-temporal matrix.

This thesis aims to explore the mechanisms of this reconstruction [3]. By synthesizing the "production of space" with contemporary theories of the sociology of time, the following chapters will analyze how news production has transitioned from a centralized hub to a liquid network. The study seeks to answer: How do intelligent technologies redefine the "materiality" of the newsroom? In what ways does algorithmic speed dictate the spatial practices of modern journalists? Ultimately, this research offers a critical reflection on the socio-temporal costs of efficiency, questioning whether the dissolution of the physical newsroom signals the erosion of the professional community or the birth of a more resilient, albeit fragmented, journalistic space.

2. Theoretical Framework: Bridging Socio-Temporal Sociology and Journalism

To understand the metamorphosis of the newsroom, it is essential to move beyond a purely technological determinist view [4]. Instead, this study adopts a socio-temporal framework that treats space and time not as neutral containers of human activity, but as active social products. This chapter establishes the theoretical foundations by integrating spatial triadic theory with the concepts of time-space distancing and compression, providing a multidimensional lens to analyze the intelligent newsroom.

2.1. The Production of Space: Lefebvre's Spatial Triad

The core of this research's spatial analysis is rooted in the concept of the social production of space. Space is fundamentally a social product, categorized into three dialectically interconnected dimensions: spatial practice, representations of space, and representational space. In the context of journalism, spatial practice, or the "perceived space," encompasses the material and physical environments where news is gathered and processed [5]. Historically, this was the centralized office, but the intelligent era has expanded this to include mobile devices, remote workstations, and sensor networks that allow production to occur at any geographic coordinate. Conversely, the "representations of space" refer to the "conceived space" designed by engineers and planners. In the intelligent media era, this is the abstract space governed by algorithmic logic, data protocols, and cloud architectures, the invisible structures that dictate the flow of information. "Representational space" or the "lived space" concerns the experienced reality of journalists, involving the symbolic meanings and professional identities that are now being reconfigured as digital mediation replaces physical co-presence.

2.2. Time-Space Distancing and the Fluid Newsroom

Complementing Lefebvre's spatiality is the theory of time-space distancing, which provides a vital lens for observing the organizational shift of the newsroom. This theory

posits that modern institutions are characterized by the "lifting out" of social relations from local contexts of interaction and their restructuring across indefinite spans of time and space. Intelligent media technologies act as powerful "disembedding mechanisms" in this process. By digitizing the editorial workflow, these technologies allow news production to transcend the limitations of a bounded "place," transforming the newsroom into a node within a global network [3, 6]. This de-territorialization signifies that the social interaction required for news production no longer necessitates the physical presence of participants in a shared room, ultimately fostering a "liquid" or fluid organizational structure that thrives on connectivity rather than proximity.

2.3. Time-Space Compression and Algorithmic Rhythms

While distanciation explains the stretching of social systems, the concept of time-space compression addresses the intensification and acceleration of the news production cycle. Technological innovations "shrink" the world by making the friction of distance increasingly irrelevant. In the intelligent media era, this compression is driven by the "just-in-time" logic of algorithmic distribution, which forces the newsroom to operate within a 24/7 cycle of instantaneousness. The temporal pressure exerted by algorithms does not merely facilitate speed but demands it as a structural necessity, reshaping the spatial logic of production. When time is compressed to the immediate "now," the physical location of the journalist becomes secondary to their integration into the digital network, leading to a state where "velocity" overrides "geography."

The integration of these theories forms the conceptual framework of this study, as illustrated in Figure 1. This framework demonstrates how the "Conceived Space" of intelligent technology, embodied in algorithms and AI, acts upon the "Perceived Space" of journalists' physical practices and their "Lived Space" of professional identity. By mapping Lefebvre's triad against the forces of distanciation and compression, we can visualize the newsroom as a dynamic field where technical logic and social reality are constantly negotiated. This model serves as the analytical foundation for the subsequent chapters, providing a roadmap to explore how the transition from a centralized hub to a liquid network fundamentally alters the essence of journalistic work.

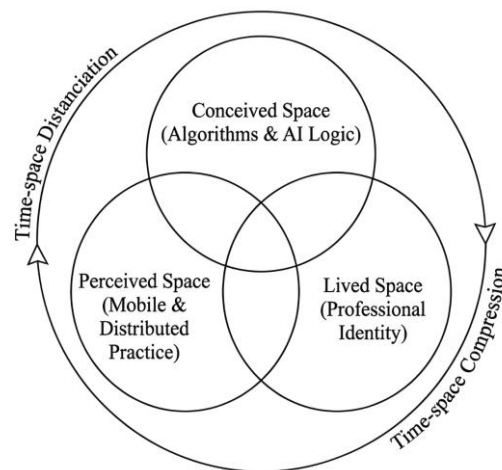


Figure 1. The Socio-temporal Analytical Framework of Newsroom Production in the Intelligent Media Era

3. Spatial Restructuring: From Centralized Hubs to Fluid Networks

The physical manifestation of the newsroom has undergone a radical departure from the "factory model" that dominated the 20th century. In the traditional era, news production was characterized by a high degree of spatial centralization, where the physical newsroom served as a mandatory "obligatory passage point" for all information. This chapter explores how intelligent media technologies have initiated a process of de-

territorialization, shifting the newsroom from a fixed geographic hub to a distributed, fluid network that transcends traditional boundaries.

3.1. The De-Territorialization of the Newsroom

In the socio-temporal framework, de-territorialization refers to the weakening of the ties between social activities and specific geographic locations. The intelligent newsroom is no longer defined by the square footage of an office building but by the reach of its digital infrastructure [7]. Cloud-based editorial systems and collaborative platforms have disembedded the production process from the physical newsroom, allowing for a virtual presence that renders physical distance obsolete. This transition suggests that the newsroom has evolved into what is described as a "space of flows," where the strategic value of a location is determined by its connectivity to the network rather than its physical proximity to the editorial center. Consequently, the office has become a redundant concept for many news organizations, as the digital architecture provides a more resilient and flexible environment for real-time collaboration.

3.2. Mobile Journalism and the Dissolution of Boundaries

The proliferation of mobile intelligent terminals and high-speed networks has further blurred the lines between "the field" and "the office." In the past, these were two distinct spatial categories: news was gathered in the field and processed in the office. However, the contemporary journalist equipped with AI-powered mobile tools can perform data analysis, video editing, and global distribution directly from the site of an event. This spatial convergence signifies the dissolution of the "editorial boundary," creating a state of perpetual mobility. The physical newsroom, once a site of concentration, is now spreading out into a multi-nodal distribution. This "spatial dispersal" does not mean the newsroom has disappeared; rather, it has become ubiquitous, existing wherever a journalist connects to the intelligent network [8, 9].

3.3. The Evolution of Morphology: From Fixed Place to Liquid Network

As illustrated in Figure 2, the morphology of news production has shifted from a rigid, centralized hierarchy to a liquid, decentralized network. The traditional model relied on "Physical Co-presence," where the synchronization of work depended on face-to-face interaction and fixed schedules. In contrast, the intelligent newsroom operates through "Network Centricity," where synchronization is achieved through algorithmic coordination and asynchronous digital communication. This structural shift highlights a fundamental change in the "spatial practice" of journalism [10]. The "fixed place" provided a sense of stability and professional enclosure, whereas the "liquid network" offers unprecedented speed and reach at the cost of physical fragmentation. This reconstruction is not merely a change in office design but a profound reorganization of the material conditions under which news is produced, signaling the rise of a "borderless" editorial environment.

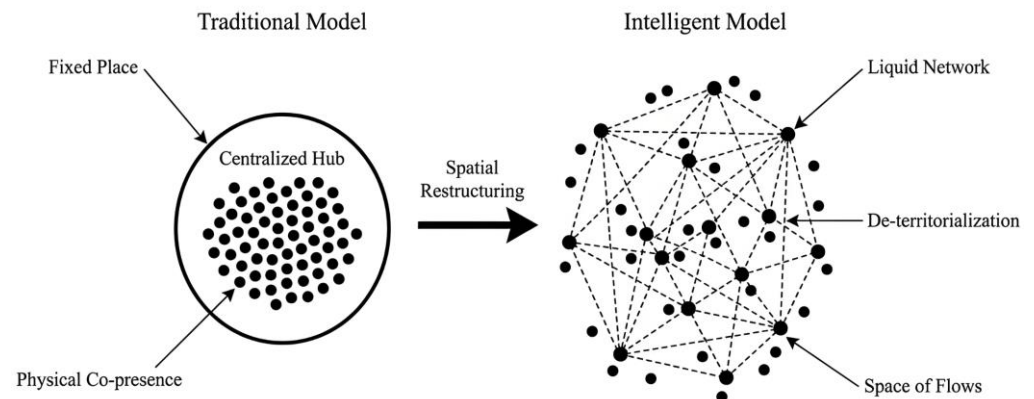


Figure 2. The Morphological Evolution of the Newsroom from a Fixed Place to a Liquid Network

4. Temporal Reshaping: The Tyranny of Real-Time and Algorithmic Rhythms

The spatial restructuring discussed in the previous chapter is closely tied to a fundamental transformation in the temporal logic of news production [11, 12]. In the intelligent media era, time is no longer a linear progression marked by the arrival of the morning paper or the evening broadcast; instead, it has been compressed into a state of "perpetual now." This chapter examines how algorithmic intervention and the pursuit of "real-time" connectivity have reshaped the temporal order of the newsroom, imposing a new form of rhythmic control that dictates the pace of journalistic labor and the lifecycle of information.

4.1. *The Collapse of the News Cycle and the Rise of Instantaneousness*

Historically, news production was governed by the "news cycle," a predictable temporal rhythm that allowed for periods of gathering, reflection, and editing. However, the integration of intelligent algorithms has triggered a collapse of these traditional boundaries, replacing the discrete cycle with a flow of instantaneousness. The concept of "time-space compression" is evident here as the temporal gap between an event's occurrence and its global dissemination shrinks toward zero. In this environment, the "deadline" is no longer a specific point in time but a continuous pressure. Intelligent scraping tools and automated alert systems ensure that newsrooms are locked in a relentless race for "the first strike," where the value of news is increasingly tied to its arrival speed rather than its depth of analysis. This shift toward instantaneousness fundamentally alters the "rhythm-analysis" of the newsroom, creating a production environment that is "always-on" and never stationary.

4.2. *Algorithmic Speed and the Alienation of Journalistic Time*

The "representations of time" in the intelligent newsroom are increasingly defined by algorithmic logic rather than human editorial judgment. Algorithms designed for maximum engagement prioritize high-frequency updates and "just-in-time" delivery, creating what can be termed as "algorithmic speed." This mechanical pace often stands in direct conflict with the human time required for investigative depth and ethical deliberation. As journalists are forced to synchronize their internal working rhythms with the "heartbeat" of the algorithm, a form of temporal alienation occurs. The journalist becomes a secondary component in a high-speed data processing chain, where the "lived time" of professional practice is colonized by the "abstract time" of technical protocols. This pressure does not merely demand faster work; it reconfigures the psychological space of the creator, as the constant demand for "real-time" output leaves little room for the "slow time" of traditional gatekeeping and editorial reflection.

4.3. *The Closed-Loop Logic of the Algorithmic Temporal Flow*

The culmination of this temporal reshaping is best visualized as a closed-loop flow, as shown in Figure 3. Unlike the linear "start-to-finish" model of traditional journalism, the intelligent newsroom operates within a circular, self-reinforcing temporal matrix. The process begins with real-time data scraping, followed by automated synthesis and instantaneous distribution, which immediately generates user feedback data that the algorithm then uses to trigger the next production cycle. This loop eliminates the "dead time" that once existed between news editions, creating a seamless, frictionless temporal environment. While this maximizes the efficiency of the "space of flows," it also creates a systemic "temporal tyranny" where the speed of the network overrides the agency of the individual actor. The newsroom, once a site of periodic activity, is thus reconstructed into a site of continuous, algorithmic acceleration, where the quest for speed becomes the ultimate governing principle of the production space.

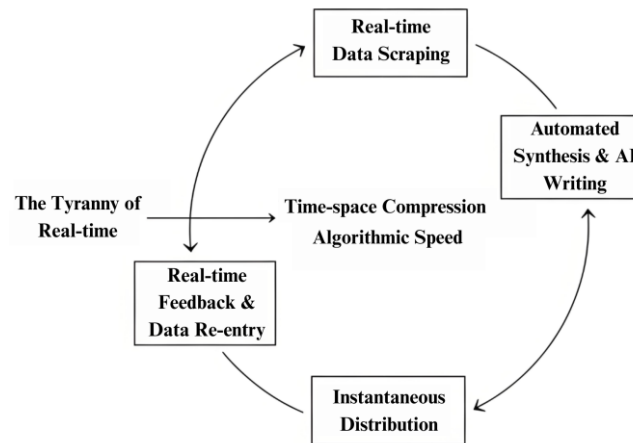


Figure 3. The Closed-loop Logic of Algorithmic Temporal Flow in the Intelligent Newsroom

5. Reconfiguration of Social Relations: Power Shifts and Identity

The radical shifts in the spatial and temporal dimensions of news production inevitably ripple into the social fabric of the newsroom, fundamentally reconfiguring the relationships between its actors. As the newsroom transitions from a physical "place" to a digital "space of flows," the traditional hierarchies and professional identities that once anchored the journalistic community are being challenged. This chapter examines how the socio-technical spatiality of the intelligent media era fosters new power dynamics between human journalists and algorithmic systems, while simultaneously diminishing the "sense of place" that has historically defined the journalistic profession [13].

5.1. The Socio-Technical Power Matrix: Journalists Vs. Algorithms

In the intelligent newsroom, the "representations of space," the technical logic designed by engineers, now exert a significant influence over the "spatial practice" of news work. This has led to a profound power shift where the authority of the traditional editor is increasingly shared with, or even superseded by, the "logic of the code." The introduction of data scientists, algorithm engineers, and AI systems into the editorial heartland has created a new social space defined by human-machine collaboration. However, this is rarely a horizontal partnership; rather, it is a complex power dynamic where the pursuit of algorithmic efficiency often marginalizes human editorial intuition. As journalists are compelled to "write for the algorithm" to ensure visibility in the space of flows, the autonomous agency of the journalistic subject is curtailed. The newsroom thus becomes a site of contestation where the professional values of public interest clash with the mathematical imperatives of engagement metrics and distribution speed [14].

5.2. The Erosion of "place-Based" Identity and Professional Rituals

Socially, the newsroom has historically functioned as a "site of ritual," where physical co-presence fostered a shared professional identity and a sense of collective purpose. The "lived space" of the newsroom was built through face-to-face interactions, newsroom culture, and the informal apprenticeship that occurred within its walls. However, the "time-space distancing" facilitated by remote work and mobile journalism has led to what sociologists call the "erosion of place." When the newsroom becomes a decentralized network, the physical rituals, such as the morning editorial meeting or the collective "buzz" of a breaking news event, are replaced by mediated interactions on digital screens. This fragmentation can lead to a crisis of professional identity; as journalists become "isolated nodes" in a global network, the sense of belonging to a cohesive professional community begins to dissolve. The "de-territorialized" journalist may enjoy greater geographic freedom, but they often face a "spatial alienation" that strips their work of its traditional social and symbolic context.

5.3. The Emergence of Virtual Communities and New Socialities

Despite the erosion of physical co-presence, the spatial restructuring of the newsroom also gives rise to new forms of "virtual sociality." While the physical walls have crumbled, new social spaces are being constructed within collaborative platforms and digital networks. These "virtual newsrooms" allow for a different kind of interaction, one that is not bounded by geography but by shared digital protocols and real-time data flows. However, these new social relations are inherently different from those of the traditional newsroom; they are more transient, more fluid, and often more utilitarian [15]. The challenge for modern journalism lies in how to cultivate a robust "professional spirit" within these fragmented, liquid spaces. As the social relations of production are remapped onto the digital grid, the newsroom must find ways to reconcile the efficiency of the "space of flows" with the human need for a "sense of place" and shared professional ethics.

6. Conclusion and Critical Reflections

The spatial restructuring of news production in the intelligent media era represents a watershed moment in the empirical and theoretical history of journalism. Through the analytical lens of socio-temporal sociology, this research has demonstrated that the "newsroom" has transcended its traditional status as a static physical container to become a dynamic, multi-nodal "space of flows." By synthesizing relevant theories, we can conclude that the transition from a centralized hub to a liquid network is not merely a logistical shift driven by technological convenience, but a profound ontological reconfiguration of how news is conceived, produced, and experienced. The findings reveal that the "intelligentization" of media has facilitated a radical de-territorialization of the editorial process. The physical boundaries of the newsroom have dissolved into a ubiquitous digital infrastructure, allowing for a "virtual presence" that renders geographic distance irrelevant. However, this spatial liberation comes at a significant temporal cost. The "time-space compression" driven by algorithmic logic has imposed a new form of temporal tyranny, where the pursuit of instantaneousness has collapsed the traditional news cycle and created a state of perpetual production.

Furthermore, the social fabric of journalism is being rewoven in ways that both empower and alienate the individual actor. While digital networks offer unprecedented connectivity and flexibility, they also erode the "sense of place" and the collective rituals that have long anchored the professional identity and ethical standards of journalists. The power dynamics within this new socio-technical space are increasingly defined by a matrix where algorithmic imperatives, such as engagement metrics and distribution velocity, often challenge or even supersede human editorial agency. This invites a critical reflection on what can be termed the "tyranny of speed." The algorithmic obsession with real-time delivery risks marginalizing the "slow time" required for investigative depth, rigorous fact-checking, and ethical deliberation. In the current space of flows, there is an imminent danger that the sheer velocity of information becomes a flawed proxy for its veracity and public value.

Looking toward the future, the newsroom will likely evolve into a state of hybrid reality where the boundaries between physical and virtual presence become even more porous through spatial computing and advanced generative AI. The challenge for the industry lies in reimagining a "sense of place" that does not rely solely on physical co-presence but on a shared commitment to journalistic values within a distributed network. As news production enters this next phase of intelligent integration, it is imperative to design technical structures that prioritize the public interest over mere engagement. Ultimately, the spatial restructuring of the newsroom is not the end of a professional tradition, but the birth of a more resilient, adaptive, and globally connected journalistic field that must consciously navigate the complexities of its new socio-temporal matrix.

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