Digital Transformation, Emotional Wage, and Employee Well- Being in Dark Stores: A Conceptual Framework

Hitesh Bhoi [1] , Pretty Bhalla[2]

Mittal school of business, lovely professional university, phagwara, Punjab

Abstract

The rapid digital transformation of supply chain operations has accelerated the emergence of dark stores that rely extensively on gig economy workers such as pickers and riders. These workers operate within digitally mediated environments characterized by algorithmic task allocation, continuous performance monitoring, and platform-based managerial control. While such systems enhance operational efficiency, they simultaneously reshape the psychological and emotional experience of work. This conceptual paper develops an integrative framework linking digital transformation practices with emotional wage and employee well-being in dark store contexts. Drawing on theories of emotional wage, sustainable human resource management, and digital labor governance, the paper argues that non-monetary rewards—such as recognition, fairness, autonomy, and flexibility—play a critical mediating role in sustaining well-being among gig workers. The framework contributes theoretically and offers managerial insights for humane digital workforce management.

Keywords

Digital Transformation; Gig Economy; Dark Stores; Emotional Wage; Employee Well-Being; Platform-Based Management; Supply Chain Workforce

1. Introduction

Digital transformation and artificial intelligence have profoundly altered workforce management practices across supply chain and retail sectors, particularly through the integration of algorithmic systems into daily operations (Vial, 2019; Kellogg et al., 2020). One of the most visible manifestations of this transformation is the rise of dark stores—digitally enabled fulfillment centers designed exclusively to support online order processing and last- mile delivery (Hübner et al., 2022). These facilities rely heavily on gig economy workers, especially pickers and riders, whose work is coordinated through digital platforms rather than traditional managerial hierarchies.

Unlike permanent employees, gig workers typically function without long-term contracts, formal career pathways, or institutionalized employment security (Wood et al., 2019). As a result, monetary compensation alone is insufficient to sustain motivation, engagement, and psychological stability. In digitally mediated work environments, emotional wage— comprising recognition, respect, autonomy, flexibility, trust, and perceived fairness—emerges as a critical determinant of employee well-being (Pfeffer, 2018; Budd & Spencer, 2023). This paper positions emotional wage as a central explanatory mechanism through which digital transformation influences the psychological, emotional, and social well-being of gig workers operating in dark stores.

2. Dark Stores and Digital Work Organization

Dark stores represent a convergence of retail logistics, artificial intelligence, and platform- based management systems. Core work processes are governed by algorithms that determine task allocation, delivery sequencing, performance ratings, and incentive structures in real time (Meijerink & Bondarouk, 2021). These systems are designed

to maximize speed, accuracy, and cost efficiency, thereby enhancing supply chain responsiveness and scalability.

However, the increasing reliance on algorithmic coordination also reconfigures power relations between workers and organizations. The absence of direct human supervision, combined with continuous digital monitoring, alters workers' perceptions of control, fairness, and organizational support (Kellogg et al., 2020; Möhlmann et al., 2021). Conceptually, digitally managed dark stores create a dual reality: operational efficiency coexists with heightened psychological strain, employment insecurity, and emotional detachment. Understanding how emotional wage operates within this digitally intensive context is therefore essential for sustainable workforce management.

3. Emotional Wage in the Gig Economy Context

Emotional wage refers to the non-financial rewards employees derive from their work experience, including dignity, recognition, autonomy, trust, social belonging, and a sense of purpose (Hochschild, 2012; Pfeffer, 2018). In gig economy settings, emotional wage assumes heightened importance due to the transactional nature of work relationships and the limited availability of conventional HR practices such as training, promotion, and job security (Ashford et al., 2018).

For pickers and riders in dark stores, emotional wage may be experienced through perceived flexibility in scheduling, transparency in algorithmic decisions, fairness in incentive allocation, and respectful digital communication from platforms (Wood et al., 2019; Budd & Spencer, 2023). Conceptually, emotional wage functions as a psychological buffer that mitigates the adverse effects of job insecurity, performance pressure, and continuous surveillance inherent in platform-based work environments.

4. Employee Well-Being in Digitally Managed Gig Work

Employee well-being in the gig economy extends beyond physical health to encompass emotional stability, psychological comfort, social inclusion, and work–life balance (Dodge et al., 2012; Van Horn et al., 2004). Digitally managed work systems influence well-being through both structural mechanisms—such as task intensity and monitoring—and experiential mechanisms, including perceived autonomy and fairness (Meijerink & Bondarouk, 2021).

While flexibility and autonomy may enhance perceived control, algorithmic opacity and constant performance evaluation can generate anxiety, stress, and emotional exhaustion (Möhlmann et al., 2021). This paper conceptualizes employee well-being as a multidimensional outcome shaped by the interaction between digital work characteristics and emotional wage perceptions. Higher emotional wage is expected to strengthen resilience and psychological safety, even in high-pressure, digitally controlled environments.

5. Conceptual Framework and Propositions

Building on the digital transformation, emotional wage, and employee well-being literature, this paper proposes a conceptual framework in which digital transformation practices influence employee well-being both directly and indirectly through emotional wage.

Digitally enabled practices—such as algorithmic task allocation, digital performance monitoring, and platform-based decision-making—shape the everyday work experiences of gig workers. Emotional wage operates as a mediating mechanism that translates these experiences into well-being outcomes.

Proposition 1: Digital transformation practices in dark stores significantly shape the emotional experiences of gig economy workers. **Proposition 2:** Emotional wage has a positive influence on employee well-being in digitally managed gig work environments. **Proposition 3:** Emotional wage mediates the relationship between digital transformation practices and employee well-being among gig workers.

6. Managerial Implications

From a managerial perspective, the framework highlights the need to humanize digital systems governing gig work. Platform designers and supply chain managers should embed emotional wage considerations into algorithmic architectures by ensuring transparency, fairness, recognition mechanisms, and accessible communication channels (Budd & Spencer, 2023). Such practices can reduce burnout, enhance perceived legitimacy of digital control, and support sustainable engagement among gig workers in dark store operations.

7. Contribution and Future Research Directions

This conceptual paper contributes to the literature by integrating digital transformation, emotional wage, and employee well-being within the underexplored context of dark stores. It advances sustainable HRM and ethical AI discourse by emphasizing the emotional dimensions of digitally governed work. Future research may empirically test the proposed framework using large-scale surveys, longitudinal designs, or mediation and moderation models across different cities and platform types.

8. Conclusion

This conceptual paper examined the interrelationship between digital transformation, emotional wage, and employee well-being within the evolving context of dark stores in the supply chain industry. As dark stores increasingly depend on gig economy workers governed by algorithmic task allocation, digital performance monitoring, and platform-based management systems, the nature of work has shifted from human-centered supervision to technology-mediated control (Vial, 2019; Kellogg et al., 2020). While such digitally enabled systems enhance operational efficiency and scalability, they also significantly reshape the emotional and psychological experiences of gig workers, particularly pickers and riders operating under conditions of employment uncertainty and performance pressure (Wood et al., 2019; Möhlmann et al., 2021).

The paper advances the argument that emotional wage—comprising recognition, fairness, autonomy, flexibility, trust, and respect—plays a pivotal mediating role in linking digitally managed work environments with employee well-being. In the absence of traditional employment security and structured HR practices, emotional wage emerges as a critical non- monetary resource that supports psychological resilience and emotional stability among gig workers (Pfeffer, 2018; Budd & Spencer, 2023). Prior research indicates that non-financial rewards and perceived organizational support significantly influence well-being outcomes, especially in high-intensity, digitally controlled work settings (Dodge et al., 2012; Van Horn et al., 2004).

The proposed conceptual framework underscores that digital transformation alone cannot ensure workforce sustainability unless accompanied by humane, transparent, and inclusive management practices. Integrating emotional wage considerations into digital platforms—such as fair algorithmic decision-making, recognition mechanisms, and responsive communication channels—can mitigate the adverse psychological consequences of continuous monitoring and job insecurity (Meijerink & Bondarouk, 2021; Kellogg et al., 2020). From a sustainable HRM perspective, such integration aligns technological efficiency with employee-centered values, thereby fostering healthier and more resilient gig work ecosystems (Pfeffer, 2018).

Overall, this paper contributes theoretically by extending digital labor and sustainable HRM literature through the explicit positioning of emotional wage as a mediating construct between digital transformation and employee well-being. It provides a robust conceptual foundation for future empirical investigations using mediation and moderation models across different digital supply chain contexts. Additionally, the study offers valuable insights for policymakers,

platform designers, and supply chain managers seeking to balance technological advancement with ethical responsibility and employee well-being in digitally transformed work environments (Budd & Spencer, 2023; Vial, 2019).

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