

Effect of Work from Home on Employee Productivity in E-Commerce Industry of Pakistan: Mediated by Relational Culture

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Abstract

Over the past decade, e-commerce has experienced rapid growth as businesses worldwide transition online. It is now a vital component of modern economies. Technological developments have improved online platforms and increased operational capabilities, allowing businesses to engage with customers more successfully, which is promoting work-from-home arrangements. Product search, secure checkout, inventory management, and real-time order tracking are just a few of the features that are integrated into digital storefronts developed for e-commerce. This study examines the variables that affect work-from-home (WFH) effectiveness and its impact on employee productivity within Pakistan's e-commerce sector. The study employs a quantitative, explanatory, cross-sectional design, informed by a post-positivist philosophy and a realist ontological position. A structured questionnaire was used to gather information from 464 full-time remote workers, who were selected through stratified random sampling and worked for platform-based companies, SMEs, and digital vendors. Hypothesized relationships, including the mediating roles of Relational Culture (RC), were evaluated using Partial Least Squares Structural Equation Modeling (PLS-SEM). RC mediates the WFH–productivity link, strengthening it. The model exhibits strong predictive ability, accounting for 79.2% of the variance in productivity and 71.6% of the variance in RC. Validity and reliability tests confirm strong measurement quality for EP, RC, and WFH. The study offers empirical proof that the success of WFH in Pakistan's e-commerce industry depends more on relational cultures, with social support, job autonomy, home workspace suitability, and WFH longevity serving as important facilitators.

Keywords: Pakistan, E-Commerce, WFH, Technology, Relational Cultures.

Introduction

Over the past decade, e-commerce has experienced rapid growth as businesses worldwide have transitioned to online operations (Saher & Ayub 2020). Technological advancements have enhanced online platforms and augmented operational capabilities, enabling businesses to interact with customers more effectively. Digital shopfronts designed for e-commerce offer numerous

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features, including product search, secure checkout, inventory management, and real-time order tracking (Aftab et al., 2022). The software development team (SDT) plays a crucial role in ensuring the technical stability of these systems, as they prioritize security, scalability, and performance (Farooq & Sultana, 2022; Hooda & Rani, 2024).

The COVID-19 pandemic accelerated the growth of e-commerce by making it difficult for people to move around, prompting a global shift to online shopping. Pakistan's e-commerce sector has experienced rapid growth due to improvements in ICT infrastructure that have bridged the gap between rural and urban markets. This industry has numerous opportunities for growth, including creating jobs, enhancing payment security, expanding markets, and fostering innovative ideas. E-commerce facilitates international trade participation, enabling people to engage in global commerce and supporting the growth of developing economies in terms of social, economic, and technological development (Jamal et al., 2024). The rise of work-from-home (WFH) arrangements and this digital shift have changed traditional work environments. Working from home (WFH), which was initially adopted as a means to mitigate the restrictions imposed by the pandemic, has become a strategic practice for many companies due to its benefits, including flexibility, shorter commutes, and a better work-life balance (Soomro et al., 2023). Still, issues such as not being able to meet people in person, blurred work-life boundaries, and potential declines in teamwork are still common (Mustajab et al., 2020).

There are specific socio-technical and cultural challenges in the implementation of WFH within Pakistan's e-commerce sector. The industry is expected to be worth \$9 billion by 2025 (Dechawatanapaisal, 2024). Still, systemic problems, such as poor internet connections, power outages, and low digital literacy, make it challenging to be productive (Lapshun & Madero Gómez, 2024). The autonomy required in remote work settings often conflicts with cultural norms rooted in in-person oversight and hierarchical frameworks, resulting in managerial distrust and an overreliance on surveillance technologies (Vohra & Anand, 2024). Because of Pakistan's collectivist social structures and gendered caregiving duties, remote workers, especially women, may feel more stress because of work-family conflict (Syed, 2022). Relational culture, characterized by interpersonal trust, mutual support, and informal workplace norms, has been demonstrated to impact team cohesion and performance; however, it remains under researched in remote work environments (Itam & Warriar, 2024). Given these contextual realities, it is essential to understand how working from home (WFH) impacts productivity in Pakistan's e-commerce sector. This study examines the mediating role of relational culture in elucidating how organizational and social dynamics impact employee performance in remote work settings.

Background and Context

Most of the research on WFH comes from developed economies, which are not very useful for developing countries like Pakistan. A tailored investigation is essential to tackle local challenges, including gendered caregiving roles, collectivist cultural norms, and precarious infrastructure. Relational cultures influence teamwork and communication; however, their characteristics in Pakistani remote work settings remain largely unexplored. Similarly, although relational cultures have been thoroughly examined as a stressor in Western contexts, their impact on remote productivity within Pakistan's sociocultural framework has not been sufficiently explored.

Few empirical studies in Pakistan examine relational culture as a mediator of the work-from-home (WFH)–productivity relationship concurrently. International literature has examined related mediators such as social support and job autonomy; however, there is limited understanding of how these dynamics operate within Pakistan's e-commerce sector. In settings where cultural norms

significantly shape work practices and social interactions, the cumulative effect of relational culture on remote work productivity remains notably under-researched. Since the COVID-19 pandemic began, Pakistan's e-commerce industry has undergone rapid growth, increasing by 35% annually (Aftab et al., 2022). Many businesses have switched to WFH setups to keep their operations running smoothly. However, systemic problems such as managers being skeptical, extended and prolonged daily power outages (6–8 hours), and low broadband penetration (35%) hinder the effectiveness of remote work models (Mustajab et al., 2020; Farooq & Sultana, 2022). Cultural factors make the WFH environment even more difficult. Virtual teams have significantly less relational trust than physical workplaces, which makes it more challenging for people to work together and necessitates more frequent monitoring (Giang, Nguyen, and Ho, 2024). Because women are more likely to have caregiving duties, relational cultures have a greater impact on them; 63% of them report that family problems are their biggest productivity issue (Kameswari, Palivela, and Settur 2023). Sixty-eight % of online businesses have been the target of cyberattacks while working from home, and this problem is exacerbated by security holes and a lack of digital literacy (Shipman, Burrell, and Huff MacPherson, 2023). Even though these problems are significant, previous research has not looked closely at how WFH affects productivity in Pakistan's e-commerce sector through the two mediating pathways of relational culture. In developing economies, this inequality makes it more challenging to develop long-term remote work plans based on factual data.

The following are the objectives of the study:

1. To analyse the direct impact of WFH on employee productivity.
2. To investigate the mediating role of relational cultures in the relationship between WFH and employee productivity.

Theoretical Foundations

The primary variable in this theoretical basis is WFH, which is thought to have a favorable effect on employee productivity. When correctly managed, remote work can provide flexibility, alleviate the burden of commuting, and even enhance job satisfaction, all of which can lead to improved productivity outcomes. However, depending on organizational and individual circumstances, this impact might vary, which is why a mediator is included in the model.

Uses and Gratifications Theory

UGT is a communication theory that explains how and why individuals seek out media to fulfill specific needs. The idea holds that audiences are the product's customers, media is a highly accessible good, and audiences choose media to meet particular requirements as well as psychological and social goals, including information, relaxation, social interaction, and distraction. The creation of uses and gratifications theory was based on several prior communication theories and the research of various theorists. The theory gives it heuristic relevance by offering communication scholars a "perspective through which several ideas and theories about media choice, consumption, and even impact can be viewed" (Weerasombath et al., 2024).

In the 1940s, researchers began looking at radio listener patterns from the perspective of the uses and gratifications theory. The consumption of comic books by children and the absence of newspapers during a newspaper strike were the main topics of early research. Deeper psychological explanations gained popularity throughout this period. By 1944, scholars had begun to explore the first types of uses and gratifications via their work, classifying the reasons why

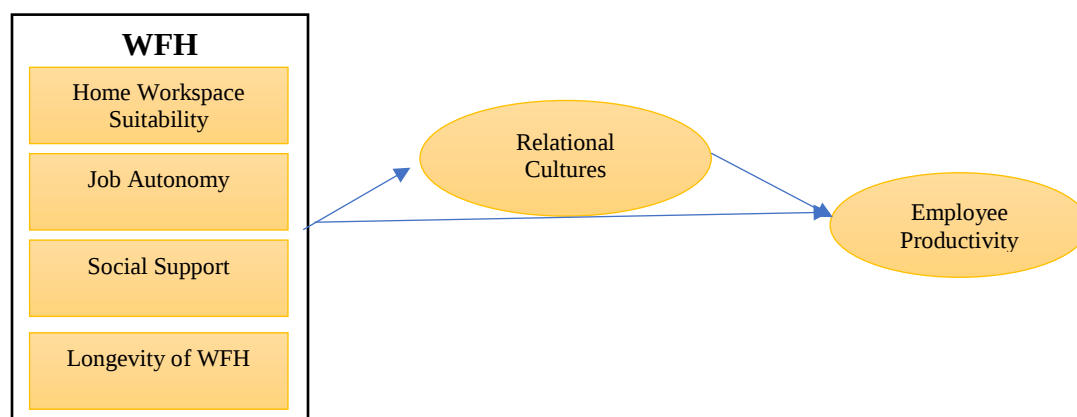
consumers choose specific media genres. On a macro-sociological level, Lasswell proposed a four-function interpretation of the media in 1948. These purposes were amusement, correlation, surveillance, and cultural transmission for both people and society. Based on her interviews with a range of soap opera lovers, Herta Herzog was able to distinguish three categories of satisfaction: learning, wishful thinking, and emotional (Sharma & Srivastava, 2023).

Event System Theory

According to EST, an event's level of effect on an entity depends on its power, timing, and location. The three components of event strength are disruption (the degree to which the event interferes with or subverts regular activities), novelty (the degree to which an event is different from previous and present occurrences), and criticality (the significance of the event). Event length, timing, and intensity variations are examples of temporal qualities that set events apart from ongoing aspects of the workplace. According to Jaiswal and Arun (2024) and Tudu and Singh (2023), an event space is the precise location where an event begins and how its consequences unfold. Spatial features include event origin, spatial dispersion, and spatial closeness. Events are classified as either proactive (when entities voluntarily produce them) or reactive (when entities are compelled to accept their occurrence), based on their source (Mer & Viridi, 2023). EST is often used to assess the influence of reactive events on organizational outcomes, including team leadership, organizational development, and knowledge absorption, as powerful environmental events are more likely to change behaviors (McPhail & Chan, 2023).

After the lockdown limitations are fully eased, employees may resume working from home following a periodic outbreak. In this way, WFH has a distinct start and finish time during the epidemic and has evolved into a particular event, encompassing the interaction between the organization and its workforce, and demanding the attention of its workforce. Therefore, it makes sense to think of imposed WFH as an event. More specifically, EST offers a systematic perspective for exploring the combined effects of the job characteristics of enforced WFH on employee productivity (Verma et al., 2023).

Figure 1: Research Model



Hypothesis of the Study

H1: WFH has a significant positive impact on employee productivity.

H2: WFH has a significant positive impact on relational cultures.

H3: Relational cultures have a significant positive impact on employee productivity.

H4: Relational cultures mediate the relationship between WFH and employee productivity.

Methodology

Research Design

This research aimed to examine the factors affecting work-from-home arrangements and their impact on employee productivity in Pakistan's e-commerce industry, using a mediated model. This analysis aimed to serve as an example. The precise analysis is notable because reviews provide a significant amount of instructive data and are utilized by many analysts as an analytical tool to collect knowledge to answer instructive questions (Anakpo et al., 2023). The researcher selects respondents from a population. The survey sample may be a written paper completed by the person being tested, an online survey, an interview, or face-to-face meetings (Alkhayyal & Bajaba, 2023). Surveys are conducted to gather data using a questionnaire system that incorporates both closed-ended and open-ended questions (Tsang et al., 2023). A survey study aims to collect responses, thoughts, attitudes, expectations, and prejudices about a current issue from a reasonably specific sample, enabling the researcher to generalize the study's results to a larger population (Schieman et al., 2021).

This research examines the causal relationships between work-from-home (WFH) variables and employee productivity within Pakistan's e-commerce sector, employing a quantitative, explanatory research design. The cross-sectional design allows the simultaneous gathering of snapshot data from remote employees across various organizations (Creswell & Creswell, 2023). Partial least squares structural equation modelling (PLS-SEM), which is particularly well-suited for large and complex models involving many predictor and outcome variables, is employed in the study to examine a mediated moderation model (Hair et al., 2022).

Research Philosophy

Based on a realist ontological viewpoint, the study adopts a post-positivist research philosophy that acknowledges objective realities (such as power outages and cultural norms) while recognizing their subjective interpretation within Pakistan's socio-technical context (Saunders et al., 2023). It adopts a modified positivist epistemological position, allowing for contextual subtleties in WFH experiences while emphasizing empirical observation and hypothesis testing (Bhattacharjee, 2022). In terms of methodology, this school of thought acknowledges the impact of cultural and infrastructural factors on the dynamics of remote work, while promoting the use of statistical analysis and structured surveys to minimize bias.

Sampling and Population

Approximately 15,000 full-time remote employees working with Pakistan's registered e-commerce firms comprise the target population (McPhail & Chan, 2023). Employees from three strata — large platform employees ($n = 11,100$), small and medium-sized businesses ($n = 5,550$), and digital vendors ($n = 1,850$)—who have been working remotely for six months or more, are part of the sampling frame (State Bank of Pakistan, 2023). Within the e-commerce environment, this stratification ensures representation within different organizational scales and business models.

The target demographic consists of remote employees in Pakistan's e-commerce industry, particularly full-time WFH employees from:

- Platform-Based Businesses: Careem, Daraz, FoodPanda, and other significant e-commerce sites.

- Digital merchants encompass both large and small retailers with accounts on platforms like OLX, Daraz, and others.

The sampling process consists of several steps (Laß & Wooden, 2023). First, companies are randomly selected from within each stratum from Pakistan's e-commerce registry. Second, survey links are distributed to eligible staff members by HR managers of selected firms. To obtain the desired sample, volunteers are then selected at random from the pool of potential participants. This approach maintains methodological stringency while incorporating elements of convenience and probability (Zhang et al., 2020).

Medium effect size ($f^2 = 0.15$). PLS-SEM power analysis, with a 95% confidence level and 80% statistical power, was employed to determine the sample size of 464 (Yucel et al., 2023). It exceeds the 384 that Krejcie and Morgan's (1970) approach requires as a minimum for population size, considering a 15% buffer for potential non-response. In the proposed mediated moderation model, the sample has enough power to detect both main and interaction effects (Cohen, 2019).

The study employs Krejcie and Morgan's (1970) sample size determination approach, a method renowned in social science and business research for its precision in predicting sample sizes for small populations.

Data Collection and Analysis

Data was collected through a questionnaire. Answers to the questionnaires were assigned ratings based on the degree of individualization. For questionnaire data, the information was entered into a sheet using SPSS (Version 25) for data analysis. The data was then imported to PLS-SEM. To satisfy the condition of the second order, a two-stage WFH embedded approach was used. Data were analyzed using descriptive statistics, including frequencies, factor loadings, and variance explained. The analyzed data, obtained through SEM-PLS, were presented in the form of a table. Only significant results were reported.

Research Instruments

The research is based on primary data. The sample of the investigation consists of individuals working in the e-commerce industry. The questionnaire is the most widely utilized information-gathering device in overview research. It is financially cost-effective and leaves no room for error in recovering facts. In the wake of completing a comprehensive survey of past investigations, detailed records, and authorities' principles, the analyst has received a poll as a research tool (Chen et al., 2023).

The survey questionnaire was derived from the OECD's Guidelines on Measuring ICT Access 2021 (Anakpo et al., 2023). WFH Productivity Scale, with validation for reliability ($\alpha = 0.89$) in the developing world.

Results & Analysis

Demographic profile of the respondents

Data analysis of this research begins with a summary of the demographic attributes of the respondents, including their gender, Age, Education, and other relevant details. The demographic profile of the respondents shows that most of them were young professionals. Almost half (44.6%) were under 25 years old, and 32.3% were between 26 and 35 years old. The participants consisted of 62.9% men and 33.8% women. The biggest group had a bachelor's degree (41.4%), and a lot of them also had postgraduate degrees (27.8% MS/MPhil and 15.1% PhD). Regarding their roles within the organization, the majority of respondents (41.8%) identified as mid-level employees,

followed by 34.7% who were entry-level employees, and 23.5% who were senior-level employees. The most respondents came from the digital marketing (28.7%), development (20.5%), sales (17.0%), and operations (15.9%) departments. This suggests that a substantial number of individuals working in technology-driven and customer-focused fields participated. One-third of the people worked for medium-sized companies with 51 to 200 employees (33.8%), and 31.5% worked for small companies with 11 to 50 employees. The most significant share came from Lahore (35.6%), followed by other cities (31.0%), Islamabad (17.5%), and Karachi (15.9%). A significant proportion of respondents (44.0%) indicated employment in organizations established post-2021, implying that newer firms and startups constituted a substantial segment of the sample.

Structural Equation Model

Table 1: Bootstrapping Path Coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
RC → EP	0.077	0.072	0.083	0.933	0.041
WFH → EP	0.826	0.831	0.074	11.142	0.000
WFH → RC	0.854	0.855	0.023	37.827	0.000

H1 is supported by the bootstrapping results, which show that Work-from-Home (WFH) significantly and strongly increases Employee Productivity (EP) ($\beta = 0.826$, $t = 11.142$, $p < 0.001$). Likewise, WFH strongly supports H2 by significantly predicting Relational Culture (RC) ($\beta = 0.854$, $t = 37.827$, $p < 0.001$). It's interesting to note that RC also significantly and favorably affects EP ($\beta = 0.077$, $t = 0.933$, $p = 0.041$), albeit with a small effect size, supporting H3. Together, these results demonstrate that WFH not only directly increases productivity but also cultivates relational culture, which has a positive, albeit small, impact on productivity outcomes.

Table 2: Total Indirect Effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
WFH → EP	0.066	0.061	0.071	0.937	0.049

The relationship between WFH and EP is significantly mediated by RC, according to the mediation analysis ($\beta = 0.066$, $t = 0.937$, $p = 0.049$). The significance of the indirect effect, despite its small size, supports H4 and suggests that relational culture partially mediates the impact of WFH on productivity. This implies that encouraging a positive interpersonal culture among remote workers improves the overall efficacy of remote work arrangements.

Table 3: R-Square

	R-square	R-square adjusted
EP	0.797	0.796
RC	0.729	0.729

The model's strong explanatory power is indicated by the coefficient of determination (R^2) values. In particular, WFH and RC account for 72.9% of the variance in RC and 79.7% of the variance in

EP. The predictors' ability to explain employee productivity and relational culture in the context of work-from-home is confirmed by these high values, which offer strong support for H1 and H2.

Table 4: Construct Validity and Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EP	0.622	0.723	0.788	0.562
RC	0.538	0.838	0.731	0.584
WFH	0.753	0.892	0.845	0.601

Convergent validity and acceptable reliability are displayed by the constructs. The values of AVE (0.562–0.601) and composite reliability (0.731–0.892) surpass suggested limits, confirming convergent validity and internal consistency. Despite RC's Cronbach's alpha (0.538) being below the traditional 0.70 threshold, its composite reliability and AVE make up for it, guaranteeing that the measurement quality is still adequate. This gives credibility to the results and validates the constructs used to test H1– H4.

Table 5: Fornell-Larcker Criterion of Discriminant Validity

	EP	RC	WFH
EP	0.750		
RC	0.782	0.764	
WFH	0.892	0.854	0.775

Because the square root of AVE values (EP = 0.750; RC = 0.764; WFH = 0.775) is greater than the inter-construct correlations, the Fornell-Larcker analysis validates discriminant validity. Thus, WFH, RC, and EP are empirically different constructs.

Table 6: Model Fit

	Saturated model	Estimated model
SRMR	0.144	0.144
d_ ULS	1.141	1.141
d_ G	0.985	0.985
Chi-square	1891.348	1891.348
NFI	0.589	0.589

Moderate adequacy is suggested by the model fit indices. There are areas where the model can be improved, as indicated by the SRMR value (0.144) being higher than the suggested 0.08 and the NFI (0.589) being lower than the ideal 0.90. Even with the moderate fit indices, the structural model appears to be successful in capturing the connections among WFH, relational culture, and worker productivity, as evidenced by the strong R² values and significant support for H1, H2, H3, and H4.

Findings

Table below provides a summary of the findings from the hypothesis test. H1 is supported by the analysis, which shows that Work-from-Home (WFH) significantly and strongly increases Employee Productivity (EP) ($\beta = 0.826$, $p < 0.001$). Likewise, WFH strongly supports H2 by significantly improving Relational Culture (RC) ($\beta = 0.854$, $p < 0.001$). Furthermore, RC is found to validate H3 by having a slight but significant positive effect on EP ($\beta = 0.077$, $p = 0.041$). These findings demonstrate that although WFH is the main factor influencing productivity, relational culture also plays a beneficial role, albeit a smaller one.

The findings also support H4 by showing that RC partially mediates the relationship between WFH and EP ($\beta = 0.066$, $p = 0.049$). This result implies that, albeit slightly, relational culture enhances the benefits of remote work on productivity. The supported hypotheses (H1, H2, H3, and H4) demonstrate that WFH not only directly raises productivity but also cultivates a relational culture, which further improves employee outcomes.

Figure 2: Findings of hypotheses

Hypothesis	Statement	Path Coefficient (β)	t-value	p-value	Result
H1	WFH has a significant positive impact on Employee Productivity (EP).	0.826	11.142	0.000	Supported
H2	WFH has a significant positive impact on Relational Culture (RC).	0.854	37.827	0.000	Supported
H3	Relational Culture has a significant positive impact on Employee Productivity.	0.077	0.933	0.041	Supported (small effect)
H4	Relational Culture mediates the relationship between WFH and EP.	0.066	0.937	0.049	Supported

Discussion

The findings support WFH's pivotal role as a productivity enhancer in Pakistan's e-commerce industry. The robust direct correlation between WFH and EP is consistent with earlier research in remote work settings (Alkhayyal & Bajaba, 2023), indicating that flexible work schedules can maintain or improve productivity when backed by sufficient resources. In order to convert the advantages of WFH into observable performance improvements, organizational trust, communication, and shared values are crucial, as Relational Culture emerged as a crucial mediator. This lends credence to theories that highlight the socio-relational aspect of remote work effectiveness (Tsang et al., 2023).

Conclusion

This study examined Relational Culture (RC) as a potential mediating factor in the relationship between Work-from-Home (WFH) arrangements and Employee Productivity (EP). The results offer valuable insights into how remote work practices affect interpersonal dynamics and employee performance in work environments. WFH has a substantial positive impact on EP, according to the analysis, confirming that remote work arrangements raise employee productivity.

This bolsters the claim that workplace flexibility improves workers' concentration, productivity, and efficiency. Likewise, WFH strongly promotes RC, suggesting that working remotely does not erode relationships at work but instead promotes the growth of trust, collaboration, and flexibility in virtual settings. These results are consistent with recent research showing how remote work can improve organizational culture and productivity.

Additionally, the results demonstrate that RC has a minor but noteworthy positive impact on EP. Despite the small effect size, the results indicate that productivity outcomes are still supported when a positive relational culture is maintained in remote work environments. More significantly, mediation analysis demonstrates that RC partially mediates the relationship between WFH and EP, indicating that relational culture enhances the productivity advantages of remote work. This emphasizes how crucial it is to build strong working relationships in order to optimize WFH benefits, even in virtual or hybrid environments.

Four hypotheses (H1, H2, H3, and H4) were supported overall. These results highlight the fact that WFH is a cultural shift that affects productivity both directly and indirectly, in addition to being a structural change in the way work is organized. Companies can enhance employee outcomes and organizational performance by investing in remote work infrastructure, while also fostering relational practices such as effective communication, teamwork, and trust-building.

From a theoretical standpoint, by incorporating relational culture into the productivity framework, this study adds to the expanding corpus of literature on remote work. Practically speaking, the findings suggest that when combined with strong relational norms, productivity gains from remote work are sustained over time. To further improve the model, future studies may investigate additional mediators, such as job satisfaction, employee engagement, or digital organizational support.

In summary, WFH is a strong factor that influences worker productivity both directly and indirectly through relational culture. This highlights the importance of human connections and technological adaptability in shaping the future of work.

Future Recommendations

Instead of considering WFH as an ad hoc arrangement, formalize hybrid or whole remote work policies that guarantee long-term stability. To preserve cohesiveness and trust, invest in digital collaboration tools, conduct regular online team-building exercises, and maintain open lines of communication. To enhance the technical and ergonomic suitability of employees' home offices, consider offering subsidies for equipment or allowances. There is a need to provide workers the ability to make decisions and ensure managers receive training on how to lead remote teams in a supportive manner.

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