

Impacts of India's New Labour Codes on Women in the Unorganized Sector: A Digital Induction Perspective

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ABSTRACT

India's recent labour law reforms, consolidated into four labour codes, aim to simplify regulation, expand social security coverage, and formalize employment through technology-driven governance mechanisms. A central feature of these reforms is the increasing reliance on digital induction, whereby workers are registered and integrated into labour and welfare systems through digital platforms. While these reforms seek to enhance inclusion, their implications for women workers in the unorganized sector remain underexplored. This study examines the impact of India's new labour codes on unorganized women workers through a digital induction perspective, focusing on awareness, accessibility, perceived impact, and barriers to inclusion.

The study adopts a cross-sectional quantitative research design and draws on primary data collected through a structured survey administered to women engaged in informal occupations across urban and semi-urban contexts (N = 134). Descriptive statistics, Pearson correlation, independent sample t-tests, one-way ANOVA, and chi-square tests are employed to examine relationships between awareness of labour codes, digital induction experience, perceived impact, barriers, and socio-demographic factors such as education and smartphone access.

The findings reveal moderate awareness of labour codes but low engagement with digital induction systems, alongside high levels of reported barriers. Smartphone access and education emerge as significant determinants of inclusion, with digitally connected and better-educated women demonstrating higher awareness, stronger digital engagement, and greater perceived benefits. Conversely, women lacking digital access experience significantly higher barriers, indicating a pattern of digital stratification. The study highlights a critical implementation gap, wherein labour reforms are conceptually inclusive but operationally exclusionary. It underscores the need for gender-sensitive, assisted digital mechanisms to ensure equitable realization of labour rights and social security for unorganized women workers in India.

Keywords: Unorganized Sector, Women Workers, Labour Code Reforms in India, Digital Induction, Informal Employment, Social Security Access, Gendered Digital Divide

INTRODUCTION

India's labour market is characterized by a deep structural dualism, with the unorganized sector accounting for more than 90 per cent of total employment, and women constituting a disproportionately large share of this workforce (Bonnet, 2019; Gotmare et al., 2024). Women employed in informal occupations—such as domestic work, construction assistance, street vending, sanitation services, and informal retail—typically experience low and irregular incomes, absence of written contracts, limited bargaining power, and minimal access to social security. Despite their critical contribution to economic activity, unorganized women workers remain among the most vulnerable groups within India's labour market (Abraham, 2017).

In an effort to address long-standing fragmentation in labour regulation, the Government of India undertook a major legislative reform by consolidating 29 central labour laws into four labour codes: the Code on Wages, the

Industrial Relations Code, the Code on Social Security, and the Occupational Safety, Health and Working Conditions Code. These reforms aim to simplify compliance, expand coverage, and extend labour protection and social security to previously excluded categories of workers, including those in the unorganized sector (Rajrishi Ramaswamy, 2023). A defining feature of this reform agenda is the increasing reliance on digital governance mechanisms, particularly digital worker registration, centralized databases, and platform-based access to welfare benefits.

The shift toward digital induction—where workers are expected to register, verify identity, and access entitlements through digital platforms—represents a fundamental transformation in labour governance. Initiatives such as national worker databases and online registration portals are intended to enhance transparency, portability of benefits, and administrative efficiency. In principle, digital systems hold the promise of overcoming traditional barriers associated with informal employment, such as lack of documentation and employer non-compliance. However, the effectiveness of such systems depends critically on workers' ability to access and navigate digital technologies.

For women in the unorganized sector, digital induction introduces a complex set of opportunities and risks. While digital platforms can facilitate formal recognition and reduce intermediaries, they also presuppose access to smartphones, digital literacy, language proficiency, and institutional support—resources that are unevenly distributed across gender, education, and income groups. Existing research on digital welfare delivery in India highlights how digital-first governance models can inadvertently produce new forms of exclusion, (Eremina, 2025) particularly for women, informal workers, and those with limited educational attainment.

The gendered nature of the digital divide further complicates the implementation of labour reforms. Studies consistently show that women in India are less likely than men to own smartphones, have independent access to digital devices, or possess advanced digital skills (Schmitz & Gabel, 2023). These disparities are especially pronounced among women engaged in informal employment, where low income, limited schooling, and unpaid care responsibilities restrict opportunities for digital engagement. As a result, digital labour governance may reproduce existing inequalities rather than alleviate them, unless deliberate corrective measures are incorporated.

Despite the scale and significance of India's labour code reforms, empirical evidence on their on-ground impact on unorganized women workers remains limited, particularly with respect to digital induction processes. Much of the existing literature focuses either on the legal architecture of the labour codes or on broader critiques of labour flexibilization, with relatively little attention to implementation dynamics and worker-level experiences (Ramaswamy, 2018; Ravi Srivastava, 2022). Moreover, while studies on digital welfare systems have documented exclusion risks, there is a paucity of research that explicitly links digital induction to labour reform outcomes for women in informal employment.

This study seeks to address this critical gap by empirically examining how India's new labour codes are experienced by women workers in the unorganized sector, with a specific focus on digital induction as the mediating mechanism (Voordijk, 2023). Rather than assessing labour reforms solely in terms of legislative intent, the study adopts a worker-centric perspective to evaluate awareness, accessibility, perceived impact, and barriers associated with digitalized implementation. By doing so, it responds to calls within labour and development scholarship to move beyond formal policy analysis and examine inclusion as a lived and differentiated process.

The study is grounded in the understanding that labour governance outcomes are shaped not only by legal provisions but also by workers' socio-economic characteristics and digital capabilities. Variables such as education level, smartphone access, and digital literacy are therefore central to understanding who benefits from reforms and who remains excluded. Prior research suggests that education enhances both comprehension of labour rights and the ability to engage with digital systems, while lack of digital access can render workers "institutionally invisible" despite legal eligibility (Aeberhard-Hodges & McFerran, 2018) ILO (2018).

By employing a quantitative, cross-sectional research design and analysing primary survey data from unorganized women workers, the study systematically examines relationships between awareness of labour codes, digital induction experience, perceived impact on work and social security, and barriers to access. The use of inferential statistical techniques—including correlation analysis, independent sample t-tests, ANOVA, and chi-square tests—allows for robust examination of how digital access and education shape inclusion outcomes. This analytical approach enables the study to move beyond descriptive accounts and identify structural patterns of exclusion embedded within digital labour governance.

Importantly, the study also captures women workers' perceptions and attitudes toward labour reforms, offering insight into the distinction between policy acceptance and practical accessibility. Existing literature indicates that marginalized workers may express trust in reform objectives while simultaneously struggling to access benefits due to implementation barriers (Mohapatra & Sahoo, 2023). Understanding this divergence is essential for designing inclusive labour governance systems that align policy intent with lived realities.

In doing so, this research contributes to multiple strands of scholarship. First, it adds to the growing literature on labour reform implementation by foregrounding the experiences of unorganized women workers. Second, it extends research on the gendered digital divide by situating digital exclusion within the context of labour rights and social security access. Finally, it offers evidence-based insights for policymakers, highlighting the need for gender-sensitive, assisted, and inclusive digital induction mechanisms if labour reforms are to achieve their stated objectives.

Overall, the study argues that while India's new labour codes represent a significant policy shift toward universalization and modernization, their reliance on digital induction constitutes a critical determinant of inclusion for women in the unorganized sector. Without addressing educational inequalities, digital access gaps, and structural barriers, digital labour governance risks reinforcing existing vulnerabilities. By empirically examining these dynamics, the study seeks to inform more equitable and effective labour policy implementation in India.

LITERATURE REVIEW

Unorganized Sector And Women's Labour In India

The unorganized sector forms the backbone of India's labour market, accounting for over 90 per cent of total employment and a substantial share of women's workforce participation (Prabhu P. Mohapatra, 2020). Women in informal employment are concentrated in low-paid, low-skilled, and insecure occupations such as domestic work, construction support, street vending, sanitation services, and informal retail. These forms of employment are typically characterized by the absence of written contracts, irregular wages, lack of collective bargaining, and minimal access to statutory labour protections and social security (Pathak & Srivastava, 2020).

Scholarly literature consistently highlights that women's informality is not merely a function of labour market conditions but is deeply embedded in social norms, gendered division of labour, and unpaid care responsibilities (Chen, 2013). As a result, women workers in the unorganized sector experience compounded vulnerability—economic insecurity intersects with gender-based exclusion, limiting their ability to access institutional support and legal remedies. This structural marginalization provides the context within which labour reforms must be assessed.

India's New Labour Codes: Objectives And Critiques

India's labour code reforms, enacted through the consolidation of 29 central labour laws into four comprehensive codes, represent one of the most significant regulatory changes in recent decades. The stated objectives include simplification of compliance, improved ease of doing business, expansion of social security coverage, and formal recognition of informal and gig workers (Chintala, 2023).

While the labour codes emphasize universalization, scholars have raised concerns regarding their actual implications for informal workers. Critics argue that the consolidation process may dilute protections, weaken enforcement mechanisms, and shift regulatory responsibility away from employers toward workers themselves (Rajrishi Ramaswamy, 2023). In the context of unorganized women workers, such shifts are particularly consequential, as they often lack the resources and institutional capacity to navigate complex compliance systems.

Importantly, the literature notes that legislative reform alone does not guarantee improved labour outcomes. The effectiveness of labour codes depends heavily on implementation mechanisms, administrative capacity, and workers' ability to engage with regulatory systems (Urbee Bhowmik, 2024). This has led to increasing attention on how labour governance is operationalized, rather than solely on the legal architecture of reforms.

Digitalization Of Labour Governance And Welfare Delivery

A defining feature of India's contemporary governance framework is the growing reliance on digital systems for service delivery, regulation, and welfare targeting. In the labour domain, digital platforms are increasingly used for worker registration, identity verification, benefit portability, and grievance redressal. Proponents argue that digitalization enhances transparency, reduces corruption, and improves administrative efficiency (Gelb et al., 2020).

However, a substantial body of literature cautions that digital-first governance models can generate exclusion, particularly for marginalized populations. (Bonnet, 2019) demonstrates how digital welfare systems in India have excluded eligible beneficiaries due to lack of access to devices, biometric failures, and low digital literacy. Similar concerns have been raised regarding labour-related digital platforms, where informal workers struggle to complete registration or access benefits without assistance.

In the context of labour codes, digital induction—defined as the process through which workers are digitally registered and integrated into formal systems—has emerged as a critical implementation mechanism. Yet, research suggests that when digital systems are introduced without parallel offline support, they risk reproducing existing inequalities (Silvia Masiero, 2020).

Gendered Digital Divide And Informal Women Workers

The digital divide in India is strongly gendered. Women are significantly less likely than men to own smartphones, access the internet independently, or possess advanced digital skills (UN Women, 2023). These disparities are more pronounced among women in informal employment, where low income, limited education, and social norms restrict digital access.

Studies focusing on gender and technology highlight that digital exclusion is not merely a technical issue but a socio-economic and cultural one (Hilbert, 2011). For unorganized women workers, lack of digital access limits not only employment opportunities but also access to welfare, information, and legal protections. As labour governance becomes increasingly digitalized, these disparities acquire heightened significance.

Research on informal women workers emphasizes that education plays a critical mediating role. Higher educational attainment is associated with greater digital confidence, better comprehension of rights, and improved navigation of online systems (Prabhu P. Mohapatra, 2020) ILO (2018). Conversely, low education amplifies digital exclusion, particularly in contexts where state services are delivered primarily through digital platforms.

Digital Induction, Awareness, And Access To Labour Rights

Awareness of labour rights is a prerequisite for effective utilization of labour protections. However, multiple studies note that awareness among informal workers remains low, particularly among women (Chen, 2013; Gelb

et al., 2020). Digital platforms have the potential to enhance awareness by centralizing information and enabling direct communication with workers.

At the same time, the literature warns that digital induction may create a paradoxical situation: while digital systems can generate awareness for those who are digitally connected, they may completely bypass those without access (Schmitz & Gabel, 2023). This creates what scholars describe as “institutional invisibility,” where workers remain outside regulatory systems despite being legally recognized (Ravi Srivastava, 2022).

Empirical studies on platforms such as e-Shram indicate uneven registration outcomes, with women and less-educated workers underrepresented (Eremina, 2025). These findings underscore the need to examine how digital induction interacts with socio-demographic factors such as education, income, and device ownership—an issue central to the present study.

Research Gap And Contribution

The existing literature provides valuable insights into labour reforms, digital governance, and gendered exclusion. However, three critical gaps remain. First, there is limited empirical research examining how India’s new labour codes are experienced by unorganized women workers at the implementation level. Second, while digital welfare systems have been studied extensively, their role in labour reform inclusion—particularly through digital induction—remains underexplored. Third, few studies systematically analyse the interaction between awareness, digital access, education, and perceived reform outcomes using primary data.

This study addresses these gaps by empirically examining the impact of labour code reforms on unorganized women workers through a digital induction lens. By analysing awareness, digital engagement, perceived impact, and barriers, and by testing differences across education and smartphone access, the study contributes evidence to debates on inclusive labour governance. In doing so, it responds to calls for gender-sensitive evaluation of labour reforms and offers insights into how digitalization can be aligned with equity objectives.

RESEARCH METHODOLOGY

Research Design

This study employs a cross-sectional quantitative research design using a structured survey to examine the impact of India’s new labour codes on women workers in the unorganized sector. The design is both descriptive and analytical, enabling assessment of how digital induction mechanisms—including digital registration, platform accessibility, and system usability—influence workers’ awareness, access to labour benefits, and overall inclusion. The study further analyses the relationships among key constructs such as awareness of labour codes, digital induction experience, perceived impact, barriers to access, and perceptions toward labour reforms.

Study Area And Context

The research focuses on women workers engaged in selected unorganized occupations in urban and semi-urban contexts. The study is contextualized within India’s labour reform transition, where labour codes aim for consolidation and digital governance of worker registration and welfare targeting (e.g., e-Shram platform and digital onboarding approaches).

Population And Sampling

Target Population

The target population comprises women employed in the unorganized sector, engaged in occupations such as construction assistance, household work, market and street vending, sanitary services, shop work, and delivery

services. These occupations are typically characterized by informal employment arrangements, including the absence of written contracts, irregular wages, and limited or no access to social security benefits.

Sampling Technique

A non-probability convenience sampling method was adopted due to the absence of an accessible sampling frame for unorganized workers and practical constraints in reaching informal women workers.

Sample Size

A total of 135 responses were collected. After screening for completeness, 134 valid responses were included for statistical analysis.

Research Instrument

Primary data were collected using a structured questionnaire consisting of two sections:

Section A: Demographic Profile

The demographics were coded as categorical variables:

- Age group (4 categories)
- Education level (4 categories)
- Type of occupation (7 categories)
- Monthly income range (4 categories)
- Smartphone access (Yes/No)

Section B–F: Likert Scale Constructs

All attitudinal statements section measured five constructs on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree):

- Awareness of Labour Codes
- Digital Inclusion and Accessibility
- Perceived Impact of Labour Codes
- Barriers and Challenges
- Perception and Support toward Labour Reforms

Each construct was operationalized by computing the mean score of its respective items.

Validity And Reliability of the Instrument

Content validity

Content validity was ensured through careful questionnaire design based on established themes in labour governance, digital inclusion, and gender-focused labour studies. The items were mapped to key dimensions identified in prior literature, particularly those addressing barriers faced by women in informal labour systems.

Internal reliability

To assess the internal consistency of the measurement instrument, Cronbach's alpha was calculated for each construct. A Cronbach's alpha value of 0.70 or above is considered acceptable for social science research.

Table 1 Reliability Statistics (Cronbach's Alpha)

Construct	No. of Items	Cronbach's Alpha
Awareness of Labour Codes	3	0.78
Digital Induction & Accessibility	4	0.82
Perceived Impact	3	0.76
Barriers & Challenges	3	0.81
Perception / Support for Reforms	3	0.74

Table 1 presents the results of the reliability analysis conducted using Cronbach's alpha to assess the internal consistency of the measurement scales employed in the study. Cronbach's alpha values indicate the extent to which items within each construct consistently measure the same underlying concept, with values above 0.70 generally considered acceptable for social science research.

The results show that all constructs exhibit satisfactory to strong internal consistency. The Awareness of Labour Codes scale records a Cronbach's alpha of 0.78, indicating reliable measurement of workers' knowledge and understanding of labour reforms. The Digital Induction and Accessibility construct demonstrates the highest reliability ($\alpha = 0.82$), reflecting strong coherence among items capturing experiences related to digital registration and platform usability.

Similarly, the Perceived Impact scale ($\alpha = 0.76$) and the Barriers and Challenges scale ($\alpha = 0.81$) exhibit robust reliability, suggesting that the items effectively capture respondents' perceptions of labour reform outcomes and the obstacles encountered in accessing digital systems. The Perception and Support for Reforms construct also shows acceptable internal consistency ($\alpha = 0.74$), confirming the reliability of attitudinal measures related to policy support.

Overall, the reliability results confirm that the questionnaire items consistently measure their intended constructs. The observed alpha values are comparable to those reported in prior studies on labour governance and digital inclusion, thereby validating the use of composite mean scores for subsequent statistical analyses and strengthening the credibility of the study's findings.

Data Analysis Techniques

The collected data were analysed using SPSS-compatible statistical procedures. Descriptive statistics (frequency, percentage, mean, and standard deviation) were used to summarize the data. Inferential statistics, including Pearson correlation, independent sample t-tests, one-way ANOVA, and chi-square tests, were employed to examine relationships and group differences among the study variables. A significance level of $p < 0.05$ was used for hypothesis testing.

RESULTS AND DATA ANALYSIS

Demographic Information

Table 2 Demographic Profile of Respondents (N = 134)

Variable	Category	Frequency (n)	Percentage (%)
Age (Years)	Less than 30	36	26.9

	31–40	50	37.3
	41–50	29	21.6
	51 and above	19	14.2
Education Level	Uneducated	81	60.4
	Primary education(1 st –8 th)	34	25.4
	Secondary education(10 th –12 th)	15	11.2
	Undergraduate level	4	3.0
Type of Occupation	Construction worker	10	7.5
	Delivery worker	4	3.0
	Household worker	5	3.7
	Market vendor	23	17.2
	Sanitary worker	58	43.3
	Shop worker	23	17.2
	Street vendor	11	8.2
Monthly Income (₹)	Less than 10,000	50	37.3
	10,001–15,000	60	44.8
	15,001–20,000	17	12.7
	20,001 and above	6	4.5
Access to Smartphone	Yes	68	50.7
	No	66	49.3

Table 2 presents the demographic characteristics of the 134 women workers surveyed in the unorganized sector. The age distribution indicates that the majority of respondents are within the economically active working-age group, with nearly two-thirds (64.2%) falling between 31 and 50 years, suggesting sustained engagement in informal employment over the life course.

Educational attainment among respondents is notably low. A substantial proportion of women workers are uneducated (60.4%), while only 14.2% have completed secondary education or higher. This educational profile is critical for interpreting subsequent findings, particularly those related to awareness of labour codes and engagement with digital induction systems.

Occupational distribution shows a high concentration in sanitary work (43.3%), followed by market vending and shop work (17.2% each). These occupations are typically characterized by informal work arrangements, limited job security, and minimal regulatory oversight, reinforcing the relevance of examining labour code implementation within this sample.

Income distribution reflects the economic vulnerability of respondents, with over 82% earning ₹15,000 or less per month, underscoring the precarious nature of unorganized sector employment. Such income levels have implications for both access to digital devices and capacity to engage with technology-driven governance mechanisms.

Finally, access to smartphones is almost evenly split, with 50.7% reporting smartphone access and 49.3% lacking access. This near-equal distribution provides a strong empirical basis for comparative analysis and supports the study's focus on digital induction as a key determinant of inclusion under India's new labour codes.

Table 3 Descriptive Statistics (N=134)

Construct	Items	Mean (M)	SD	Interpretation
Awareness of labour codes	3	2.83	1.09	Moderate
Digital induction & accessibility	4	2.60	1.28	Low
Perceived impact	3	2.46	1.19	Low–Moderate

Barriers	3	3.60	1.14	High
Perception/support	3	3.81	0.60	High

Table 3 reports the mean and standard deviation values for the five core constructs measured in the study. Awareness of labour codes records a moderate mean score ($M = 2.83$), indicating partial knowledge among respondents about recent labour reforms. This suggests that while information about labour codes has reached some women workers, dissemination remains insufficient.

Digital induction and accessibility show a low mean score ($M = 2.60$), revealing limited engagement with digital registration systems and labour platforms. This finding is significant because digital induction is a central implementation mechanism under the new labour codes. In contrast, barriers record a high mean score ($M = 3.60$), confirming the prevalence of constraints such as lack of digital skills, limited access to devices, language difficulties, and inadequate institutional support.

Interestingly, respondents express high perception/support for labour reforms ($M = 3.81$), indicating trust in policy intent despite practical challenges. This divergence between positive perception and low digital access reflects what prior research describes as “policy acceptance without operational inclusion” in digital welfare systems (Ramaswamy, 2018; Ravi Srivastava, 2022). The results align with gender-focused studies that document how digital divides disproportionately affect women in informal employment (Prabhu P. Mohapatra, 2020; UN Women, 2023) ILO(2018).

Table 4 Pearson Correlation Matrix

Construct	Awareness	Digital induction	Impact	Barriers	Perception
Awareness	1.00	0.83	0.65	-0.75	0.61
Digital induction	0.83	1.00	0.73	-0.78	0.63
Impact	0.65	0.73	1.00	-0.62	0.70
Barriers	-0.75	-0.78	-0.62	1.00	-0.56
Perception	0.61	0.63	0.70	-0.56	1.00

Table 4 presents the Pearson correlation coefficients among the study constructs, revealing the strength and direction of relationships. A strong positive correlation between awareness and digital induction ($r = 0.83$) indicates that higher awareness of labour codes is closely associated with better engagement in digital registration and platform usage. This suggests that digital engagement itself may function as an awareness-enhancing mechanism.

Perceived impact also shows a strong positive association with digital induction ($r = 0.73$), implying that women who successfully navigate digital systems are more likely to perceive tangible benefits from labour reforms. Conversely, barriers exhibit strong negative correlations with awareness ($r = -0.75$) and digital induction ($r = -0.78$), highlighting the decisive role of structural constraints in limiting inclusion.

These patterns confirm findings from digital governance literature that emphasize how barriers such as digital illiteracy and access gaps systematically undermine welfare delivery, even when legal frameworks are inclusive (Rajrishi Ramaswamy, 2023; UN Women, 2023). The correlation results thus empirically validate the argument that digital labour reforms are highly sensitive to enabling conditions at the worker level.

Table 5 Independent Sample t-test (Smartphone Access Differences)

Construct	No Smartphone Mean	Smartphone Mean	p-value
Awareness	2.29	3.35	<0.001

Digital induction	1.99	3.18	<0.001
Impact	2.12	2.79	<0.01
Barriers	4.11	3.11	<0.001
Perception	3.60	4.02	<0.001

Table 5 reports the results of an independent sample t-test comparing mean construct scores between women workers with and without smartphone access. Mean values represent average agreement on a five-point Likert scale, while p-values indicate the statistical significance of group differences.

The results reveal systematic and statistically significant differences across all constructs. Women with smartphone access report substantially higher awareness of labour codes ($M = 3.35$) than those without smartphones ($M = 2.29$), with the difference highly significant ($p < 0.001$). A similar pattern is observed for digital induction and accessibility, where digitally connected women exhibit markedly higher engagement ($M = 3.18$) compared to digitally excluded women ($M = 1.99$; $p < 0.001$). These findings indicate that smartphone access is closely associated with both awareness of labour reforms and the ability to engage with digital registration systems.

Perceived impact of labour codes also differs significantly between the two groups, with higher mean scores among women with smartphones ($M = 2.79$) than those without ($M = 2.12$; $p < 0.01$), suggesting that digital access enhances the likelihood of experiencing tangible benefits from reforms. In contrast, women without smartphones report significantly higher barriers ($M = 4.11$) compared to their digitally connected counterparts ($M = 3.11$; $p < 0.001$), reflecting greater constraints related to information access, system usability, and institutional support.

Additionally, women with smartphone access express stronger positive perceptions toward labour reforms ($M = 4.02$) than those without smartphones ($M = 3.60$; $p < 0.001$). Collectively, the results demonstrate that smartphone access functions as a critical enabler of inclusion within digitalized labour governance. The consistency and magnitude of these differences suggest that digital access is not a peripheral factor but a central determinant shaping women workers' engagement with India's new labour codes, reinforcing concerns in existing literature that digital-first implementation may inadvertently marginalize informally employed women lacking access to digital devices (Boris et al., 2018; Chen, 2013)ILO(2018).

Table 6 One-Way ANOVA (Education Level Group Differences)

Dependent Variable	F	p-value	Result
Awareness	8.27	0.000045	Significant
Digital induction	7.16	0.000174	Significant

Table 6 presents the results of one-way ANOVA tests assessing whether education level significantly influences women workers' awareness of labour codes and digital induction experience. The F-statistics indicate the extent to which mean scores on these constructs differ across education groups, while the p-values indicate the statistical significance of these differences.

The results show that education level has a statistically significant effect on both awareness ($F = 8.27$, $p = 0.000045$) and digital induction ($F = 7.16$, $p = 0.000174$). These findings indicate that women with higher levels of education demonstrate substantially greater awareness of labour reforms and stronger engagement with digital registration and platform-based systems compared to those with lower educational attainment.

The significance of these differences suggests that education functions as a key enabling factor in digital labour governance. Higher education enhances not only understanding of labour rights but also the capacity to navigate

digital systems required for accessing benefits. Conversely, lower educational attainment limits digital participation, thereby intensifying exclusion from reform outcomes. These findings align with existing research documenting how educational disparities amplify the gendered digital divide and constrain women's access to digitally mediated welfare and labour governance mechanisms in informal employment settings (Prabhu P. Mohapatra, 2020; UN Women, 2023)

Table 7 Chi-Square Test

Variables	χ^2	p-value	Interpretation
Education $\times$ Smartphone access	24.89	0.000016	Significant association

Table 7 reports the results of a chi-square test examining the association between education level and smartphone access among women workers in the unorganized sector. The statistically significant chi-square value ($\chi^2 = 24.89$, $p = 0.000016$) indicates a strong association between the two variables, confirming that smartphone access is not evenly distributed across education categories.

The results show that women with lower levels of education are significantly less likely to have access to smartphones, while higher educational attainment is associated with greater digital access. This finding is particularly important in the context of digitalized labour governance, as smartphone access serves as a gateway to awareness, registration, and utilization of labour welfare mechanisms.

The observed association points to a compounding exclusion effect, whereby educational disadvantage limits digital access, which in turn restricts participation in digitally mediated labour reforms. Such layered exclusion has been widely documented in gender and digital divide literature, which cautions that digital governance systems may unintentionally reinforce existing social and educational inequalities unless accompanied by targeted facilitation and support mechanisms (Ramaswamy, 2018; Ravi Srivastava, 2022)

DISCUSSION, FINDING, LIMITATION & CONCLUSION

Discussion

This study examined the impact of India's new labour codes on women workers in the unorganized sector, with particular emphasis on digital induction as a key implementation mechanism. The findings reveal a significant gap between the inclusive intent of labour reforms and their practical realization, highlighting the complex intersection of labour governance, gender, and digital access.

The results indicate that awareness of labour codes among unorganized women workers remains only moderate, despite the transformative scope of these reforms. This reinforces earlier evidence that labour law dissemination in informal employment contexts is weak and uneven. Importantly, the findings demonstrate that awareness alone is insufficient to ensure access to labour protections when engagement with digital systems is required. Limited familiarity with digital platforms restricts the translation of legal knowledge into effective utilization of benefits.

Digital induction and accessibility emerged as particularly weak areas, as reflected in low mean scores. While digital platforms are intended to enhance transparency, efficiency, and benefit portability, their effectiveness is contingent on workers' digital readiness. For many women in informal employment, the digital-first approach has not translated into meaningful inclusion due to constraints related to device ownership, skills, and institutional support.

The study identifies structural barriers as the most critical constraint shaping outcomes. High barrier scores and strong negative correlations with both awareness and digital induction underscore how lack of smartphones, low digital literacy, language challenges, and insufficient facilitation impede engagement with digital labour

governance. These constraints create a bottleneck wherein legal entitlements exist but remain inaccessible in practice.

Further, the statistically significant differences based on smartphone access and education levels reveal an emerging pattern of digital stratification. Women with smartphones and higher education consistently report better awareness, smoother digital induction, and greater perceived benefits, while those without access remain marginalized. This stratification suggests that digital labour governance risks reproducing existing social inequalities by conditioning access to rights on digital ownership and capabilities rather than legal eligibility.

Despite these challenges, women workers expressed positive perceptions and trust in the objectives of labour reforms. This contrast between supportive attitudes and limited practical access highlights a critical policy gap: while labour codes are conceptually inclusive, their digitalized implementation remains operationally exclusionary.

Overall, the findings suggest that digital induction functions as a double-edged mechanism—enhancing inclusion for digitally equipped workers while simultaneously excluding those lacking access and skills. Without gender-sensitive facilitation and supportive institutional mechanisms, digital labour reforms may inadvertently reinforce, rather than reduce, inequalities within the unorganized sector.

Key Findings

The analysis reveals a critical disconnect between labour reform intentions and field-level outcomes among women in informal employment. While respondents generally expressed supportive perception toward labour reforms and the idea of digital systems, both awareness and digital induction experience remain low. Importantly, barriers are high, revealing that digital induction is not uniformly accessible. Correlation results demonstrate that awareness and digital induction reinforce each other—suggesting that workers with even limited access to digital systems tend to become more informed and more capable of claiming benefits. However, barriers such as lack of device access, low digital literacy, and language issues restrict this pathway for a significant portion of respondents.

Group comparison results further show that smartphone access and education create clear social divides in labour reform access. Women with smartphones exhibit significantly stronger outcomes in awareness, induction and perceived benefits, whereas women without smartphones experience higher barriers and lower engagement. This suggests that reforms relying heavily on digital systems may cause “institutional invisibility” of excluded women—where legal entitlements exist, but practical access remains limited.

Limitations Of The Study

While this study offers valuable insights, several limitations should be acknowledged. First, the use of convenience sampling restricts the generalizability of findings beyond the sampled population. Second, the study focuses primarily on urban and semi-urban contexts; rural women workers may face additional or different constraints. Third, the analysis relies on self-reported perceptions, which may be influenced by recall bias or social desirability bias. Finally, the cross-sectional design does not allow for causal inference or examination of long-term outcomes of labour reforms.

Future research may adopt longitudinal designs, expand geographic coverage, or incorporate qualitative case studies to capture deeper contextual dynamics.

Policy Implications

The findings of this study have important implications for labour policy and implementation:

Assisted Digital Registration:

Government agencies should establish offline-to-online facilitation centers, mobile registration camps, and community-based support mechanisms to assist women workers in digital onboarding.

Gender-Sensitive Digital Design:

Labour platforms should be designed with low-literacy interfaces, multilingual support, and audio-visual guidance to improve usability for women workers.

Digital Literacy and Training:

Targeted digital literacy programs for unorganized women workers should be integrated into labour welfare schemes.

Device Accessibility:

Subsidized smartphones or shared digital access points can help bridge the digital divide and prevent exclusion.

Institutional Outreach:

Labour departments, local bodies, and civil society organizations must play an active role in awareness-building and trust generation.

CONCLUSION

This study provides empirical evidence that while India's new labour codes represent a progressive attempt to universalize labour protection and social security, their effectiveness for women in the unorganized sector is significantly shaped by the mode of implementation. The reliance on digital induction mechanisms has created a critical inclusion gap, where access to labour rights increasingly depends on digital access, literacy, and educational background.

The findings demonstrate that awareness and digital induction are strongly interconnected, but both are constrained by persistent structural barriers. Women workers without smartphones or adequate digital skills remain at risk of exclusion, despite being legally eligible for protection and benefits. This situation highlights the danger of policy inclusion without practical accessibility.

For labour reforms to achieve their intended outcomes, digital governance must be complemented by gender-sensitive facilitation, inclusive design, and on-ground institutional support. Addressing the digital divide is not merely a technological challenge but a fundamental requirement for equitable labour governance. By centering women lived experiences, this study contributes to ongoing debates on labour reform implementation and underscores the need for inclusive, rights-based digital transformation in India's labour market.

REFERENCES

1. Abraham, R. (2017). Informality in the Indian Labour Market: An Analysis of Forms and Determinants. *The Indian Journal of Labour Economics*, 60(2), 191–215. <https://doi.org/10.1007/s41027-017-0096-x>
2. Aeberhard-Hodges, J., & McFerran, L. (2018). An International Labour Organization instrument on violence against women and men at work: The Australian influence. *Journal of Industrial Relations*, 60(2), 246–265. <https://doi.org/10.1177/0022185617712751>
3. Bonnet, F. (2019). Women and Men in the Informal Economy – A Statistical Brief.
4. Boris, E., Hoehtker, D., & Zimmerman, S. (2018). Women's ILO: Transnational Networks, Global Labour Standards, and Gender Equity, 1919 to Present. BRILL.

5. Chen, M. A. (2013). Informal Workers in the Developing World: Organizing in the Global Economy. *New Labor Forum*, 22(1), 67–73. <https://doi.org/10.1177/1095796012471310>
6. Chintala, S. R. (2023). Emerging Patterns of Collective Action in India's Platform Economy: A Study of Drivers and Delivery Workers. *Relations Industrielles / Industrial Relations*, 78(3). <https://doi.org/10.7202/1110483ar>
7. Eremina, D. (2025). Digital transformation's impact on public governance. <https://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-246227>
8. Gelb, A., Mukherjee, A., & Webster, B. (2020). Can Digital G2P Transfers Drive Financial Inclusion and Digital Payments? Evidence from India.
9. Gotmare, P. R., Mukhtar, Md. S., Bhat, L. D., & Sumalatha, B. (2024). Impact of COVID-19 on the Livelihoods, Health, Well-being and Pay Disparity of Women Workers in Unorganised Sector in India. *The Indian Economic Journal*, 00194662241299080. <https://doi.org/10.1177/00194662241299080>
10. Hilbert, M. (2011). Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics. *Women's Studies International Forum*, 34(6), 479–489. <https://doi.org/10.1016/j.wsif.2011.07.001>
11. Mohapatra, B. D., & Sahoo, C. K. (2023). Social Security for Unorganized Workers in India: Still a Long Journey Ahead.
12. Pathak, D., & Srivastava, S. (2020). Journey from passion to satisfaction: Roles of belongingness and psychological empowerment: A study on social workers. *International Journal of Sociology and Social Policy*, 40(3–4), 321–341. <https://doi.org/10.1108/IJSSP-11-2019-0237>
13. Prabhu P. Mohapatra. (2020). India and the ILO: chronicle of a shared journey 1919—2019—International Labour Organization. <https://researchrepository.ilo.org/esploro/outputs/book/India-and-the-ILO-chronicle-of/995219178702676>
14. Rajrishi Ramaswamy, Dr. A. B. (2023). Full article: An analysis of the impact of India's Labour Codes on its organized and unorganized sectors. <https://www.tandfonline.com/doi/full/10.1080/23311886.2023.2238458>
15. Ramaswamy, E. A. (2018). Politics and Organized Labor in India. In *Peasants and Proletarians*. Routledge.
16. Ravi Srivastava. (2022). Migration, Informality and the Growing Precarity of Work—Ravi Srivastava, 2022. <https://journals.sagepub.com/doi/abs/10.1177/00490857221125856>
17. Schmitz, C. L., & Gabel, S. G. (2023). Women, Human Rights, and Gender Equality. *Journal of Human Rights and Social Work*, 8(4), 359–360. <https://doi.org/10.1007/s41134-023-00288-7>
18. Silvia Masiero, S. B. (2020). Full article: Digital identity for development: The quest for justice and a research agenda. <https://www.tandfonline.com/doi/full/10.1080/02681102.2021.1859669>
19. UN Women. (2023). Women, Human Rights, and Gender Equality | *Journal of Human Rights and Social Work* | Springer Nature Link. <https://link.springer.com/article/10.1007/s41134-023-00288-7>
20. Urbee Bhowmik. (2024). Identities and the City: Socialities amongst Migrant Domestic Workers in Kolkata—Urbee Bhowmik, 2024. <https://journals.sagepub.com/doi/full/10.1177/09737030241239486>
21. Voordijk, H. (2023). Technical mediation and digital technologies in construction practice. *Architectural Engineering and Design Management*, 19(2), 110–124. <https://doi.org/10.1080/17452007.2021.1944840>