Mapping the Determinants of Gig Worker Well-Being: An ISM-MICMAC Approach

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Abstract. The gig economy is growing quickly and revolutionizing labour markets by enabling flexible, task-oriented jobs, but at the same time brings very serious questions about well-being of workers, earnings, and occupational safety. The study analyses the structural dependencies of the prominent determinants influencing the gig workers' wellbeing by applying the techniques of ISM and MICMAC analysis. Ten key factors were identified based on literature review and expert consultation: flexible working, income, occupational hazards, precariousness, work protections, platform reliance, regulatory intervention, job security, job loyalty and well-being. ISM was utilized to develop a multilevel hierarchical ISM-induced model to identify the causality and directionality of the variables, and MICMAC analysis classified them as per their driving and dependence power. The results suggest that worker well-being is an outcome that is heavily contingent on foundational drivers such as income stability, and the conditions of work, with the agency of workers being a critical mediating device, regulatory interventions and worker protections being necessary. The study presents a full framework to characterise the multifaceted dynamics of gig work and provides practical implications for all stakeholders involved in the development of more sustainable and fair labour systems in the future.

Keywords: Gig Economy, Worker Well-being, Interpretive Structural Modelling (ISM), Income Stability, Platform Dependency, Economic Precarity, Occupational Hazards, Labour Policy.

1 Introduction

The gig economy, which entails short-term, task-focused work on digital platforms, has become an expanding phenomenon worldwide, transforming the nature of today's workplace (Hsieh, Adisa, Bafna, & Zhu, 2023; Lesala Khethisa, Tsibolane, & Van Belle, 2020) [9][14]. This type of transformation opens up considerable opportunities: flexibility, independence, and the ability to shape working hours in accordance with personal needs, which may be especially appealing as the labor market has become much more dynamic (Blázquez et al., 2024; Kurian & Madhavi, 2024) [4][13]. However, this flexibility often does so at the cost of

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financial stability and increased workplace risks, leading to serious questions about the health and safety of gig workers.

Gig work still presents economic insecurity as a major issue, since those working in gig economy usually have no minimum work-related benefits such as health insurance, pension, and paid leave entitlement has resulted in increased exposure for them to the uncertainty and stress of the money aspects (Ng, Samsudin, & Daud, 2024; Abdullah, Bahri, & Md Yusof, 2024) [17][1]. The COVID-19 crisis additionally exacerbated these vulnerabilities as the pandemic has brought into the fore the deficiencies in social protection systems and reinforced the need for immediate policy interventions to stabilize gig workers' financial wellbeing (Auguste, Roll and Despard, 2024, Katiyatiya and Lubisi, 2025) [2][11].

Further, gig workers face numerous occupational health hazards, including physical threats related to road traffic accidents and exposure to extreme weather conditions, particularly among on-demand delivery workers (Hsu, 2025; Morita et al., 2022) [10][16]. Furthermore, psychological risks, such as high stress, anxiety, and burnout, are facilitated by the permanent demands set by digital devices (Mattila et al., 2024; Taylor et al., 2023; Au-Yeung, Chan, Ming, & Tsui, 2024) [15][20][3]. The risks of these negative health and safety outcomes are heightened by the confluence of algorithm-determined performance targets set at the precarity of that work.

Amidst the two challenges of economic insecurity and workplace risk, there is an urgent need for broad ranging strategies that reconcile flexibility with basic safeguards. Policy-makers alongside platform managers must co-create focused regulative regimes around fair wage system, expanded social security nets and strict safety measures for the wellbeing of the gig workers (Choudhary & Shireshi, 2022; Healy & Pekarek, 2020; Patel, Nisar, & Chavan, 2024) [6][8][18]. This work seeks to investigate the interconnected relationships between economic security, work-related risks, and the societal welfare of individuals involved in the gig economy to help create a sustainable gig ecosystem that is fair.

1.1 Objectives of the Study

1. To examine the influence of economic security and occupational risk on well-being among gig-working individuals.
2. To recognize and develop relationships among the critical factors affecting the outcomes of gig workers through the propositions of the (ISM).
3. To categorize the variables for driving and dependence power with the help of the MICMAC analysis.
4. To inform policy and the management of platforms in terms of how to enhance policies protecting workers and laws regulating the gig economy.

2 Methodology

Drawing on interpretive structural modelling (ISM) and MICMAC (Cross-Impact Matrix Multiplication Applied to Classification) analysis, this study adopts a system modelling approach to investigate the interdependence among the key antecedents of well-being of gig workers. Research Design This is an exploratory and analytic design with the intent of

establishing a nested system of relationships that might account for various causal flows among institutional, economic and occupational factors. Ten indicators work flexibility, income stability, job hazards, economic precarity, worker protections, platform dependency, regulatory interventions, worker well-being, economic security, and job commitment were based on a comprehensive review of the literature and were validated through expert input.

The domain experts - researchers and workers in gig economy - have been interviewed to give qualitative groundings on relationships between the variables. This information was then employed in the construction of the SSIM (Structural Self-Interaction Matrix) that was the basis for further analyses. These were then converted into an initial and final reachability matrix, applying the principle of transitivity to make the result logically consistent. Level and full conjunctive partitioning of the required link of the position of variables in the hierarchy position of variables in the hierarchy were undertaken This was succeeded by the formation of a conical matrix and digraph, from which the final ISM model was derived in an aesthetic four-quadrant mean-ends model that illustrates the as-is structure of the hierarchy of relationships among the variables.

In order to confirm and reinforce the ISM results, MICMAC analysis was used to categorize the factors according to their driving power and dependency power. This classification split the variables into four groups: autonomy, dependency, dependence, and independence, providing a further insight into the systemic properties in which variables operate. Manual matrix calculation and spreadsheet software were used to perform the modeling, following methodologies common in systems modeling literature. For trustworthiness many steps were taken, such as: scrutinising by experts in the field for reliability and validity, triangulation with other available formal theories, and cross-checking the content of the model over all stages of analysis for internal consistency.

2.1 Variables Identified for ISM

Work flexibility (W F) is the degree of freedom workers have in scheduling, deciding how much work to do, and determining the way to perform the task. Although gig work is presented as flexible, what constitutes as agency attached to this is often constrained in practice particularly in the context of economically marginalised workers who are reliant on platform algorithms (Wan et al., 2024; Kincaid & Reynolds, 2024) [21][12].

IS is the extent to which cash flows are regular and predicable over time. Gig workers often face significant income volatility as a result of piece-rate remuneration schemes and fluctuating demand, which in turn contributes to financial instability and lack of long-term planning (Blázquez et al., 2024; Chen et al., 2022) [4][5].

Gig work hazards (GH) represent a variety of threats to workers that arise within gig work, such as physical and job insecurity along with psychological strains like algorithmic management. Such risks are compounded by no institutional protections and the nature of platform work (Chen et al., 2022; Cram et al., 2020) [5][7].

Economic Precarity (EP) is the state of being subject to insecure work situations, intermittent wage payments, and government assistance restriction. This instability also cripples the

possibility for workers to orient on building a professional career, resulting in chronical stresses from lack of occupational commitment and with it, “lower job satisfaction and poorer mental health” (Blázquez et al., 2024; Chen et al., 2022) [4][5].

WP refers to legal and institutional mechanisms that make sure that workers are entitled to their fair wages, health safety, redressal of their complaints and other rights as provided for employment. Given the lack of formal contracts and welfare entitlements in gig work, the protections for workers to ensure dignity and fairness must be strengthened among platform workers (Choudhary & Shireshi, 2022; Hsieh et al., 2023) [6][9].

That trend is called platform dependency (PD), where gig workers depend on digital platforms to get work, find tasks, and receive performance assessments. This dependency undermines worker agency, sustains algorithmic control and contributes to emotional strain as workers become the playthings of opaque, and sometimes punitive, processes (Cram et al., 2020; Wan et al., 2024) [7][21].

Regulatory interventions (RI) are formal actions of governments or their regulatory agencies that produce enforceable measures in the gig economy. These might include labour standards, social security entitlements, algorithmic transparency obligations and collective bargaining rights, all designed to stem exploitation and ensure that gig work is viable and sustainable (Choudhary & Shireshi, 2022; Hsieh et al., 2023) [6][9].

WW is the overall condition in physical, psychological andpolitical terms of workers. Under the gig model, well-being concerns stem from job autonomy, social interactions, as well as workloads and perceptions of fairness, and many gig workers experience negative impacts related to work-related stress and social isolation (Chen et al., 2022; Reid et al., 2023; Wan et al., 2024) [5][19][21].

Economic security: the extent of income and employment stability that allows gig workers to meet their basic financial needs and achieve a modest standard of living. In the gig economy, workers are in a precarious situation with regard to income instability, where uncertainties of employment increase and financial stress deteriorates mental health (Blázquez, Herrarte, & Moro-Egido, 2024; Kurian & Madhavi, 2024) [4][13].

“Job commitment (JC) is the psychological engagement and sense of loyalty that an individual has with respect to his or her job. The level of dedication of gig workers is determined by their level of autonomy, satisfaction and the feeling that they are empowered or abused by the governance of the platform (Wan et al, 2024) [21].

2.2 Analysis and Interpretation

The Structural Self-Interaction Matrix (Fig 1) presents the contextual relationships among the ten identified variables, using symbolic notations (V, A, X, O) to capture expert judgments about directional influence. This matrix forms the foundation of the ISM process by defining how each variable affects or is affected by others. Building upon this, the Reachability Matrix (Fig 2) transforms these qualitative judgments into a binary format, where ‘1’ indicates the presence of influence and ‘0’ its absence. It also computes the driving power and dependence

power of each variable, offering a preliminary view of variable hierarchy. The Final Reachability Matrix (Fig 3) incorporates the principle of transitivity to ensure logical consistency within the system and forms the basis for deriving the levels of each variable.

Following this, the Level Partitioning table (Fig 4) identifies three levels in the structural hierarchy by comparing the reachability and antecedent sets of each variable. Variables V1, V2, and V3 were found to lie at the base (Level 3), while V8, V9, and V10 emerged as outcome variables (Level 1). This process is iteratively validated in Fig 5, which details the step-by-step elimination of variables across levels to confirm their final positions in the model. The Conical Matrix (Fig 6) then rearranges variables according to these levels and restates their respective driving powers, thereby confirming the logical structure derived from earlier matrices.

To enhance clarity, the Reduced Conical Matrix (Fig 7) simplifies the hierarchical relationships, preserving only essential structural elements to support interpretability. The classification of variables is further visualized in the MICMAC graph (Fig 8), which categorizes them into four groups: autonomous, dependent, linkage, and independent. Variables V1, V2, and V3 are placed in Quadrant IV as independent variables with high driving but low dependence power, while V8, V9, and V10 are categorized in Quadrant II as highly dependent variables. The Digraph (Fig 9) presents a visual flow of influence among all variables, showing directional links that represent the logical dependencies mapped in the ISM process. Finally, the Final Model (Fig 10) offers a structured and interpretable diagram of the entire ISM hierarchy, clearly distinguishing between foundational drivers, intermediate mediators, and outcome-level variables that define gig worker well-being.

The structural analysis using Interpretive Structural Modeling (ISM) revealed a clear hierarchical pattern among the ten variables identified in the study. The three variables Work Flexibility (V1), Income Stability (V2), and Occupational Hazards (V3) were positioned at the bottom level (Level 3) of the hierarchy. These variables exhibited the highest driving power (each scoring 6), with relatively low dependence on other variables. Their placement at the base signifies that they are fundamental drivers in the system. These constructs initiate influence over several other variables, making them critical to any structural intervention in the gig economy.

At the intermediate level (Level 2), four variables Economic Precarity (V4), Worker Protections (V5), Platform Dependency (V6), and Regulatory Interventions (V7) were identified. These variables exhibited both moderate to high driving power (4) and moderate dependence, classifying them as linkage variables. They serve as conduits, receiving influence from foundational work conditions and transmitting it to more distal outcomes. Their dual role reflects structural vulnerability, where small perturbations can lead to widespread consequences throughout the system.

The top level (Level 1) of the hierarchy included the variables Worker Well-being (V8), Economic Security (V9), and Job Commitment (V10). These constructs exhibited the highest dependence power (10) and the lowest driving power (3), indicating they are purely dependent variables. Their positioning at the apex of the structural model confirms that they are

outcomes shaped by the complex interplay of upstream variables but exert no significant influence on others.

The results from the MICMAC analysis corroborate these structural findings. Variables V1 (Work Flexibility), V2 (Income Stability), and V3 (Occupational Hazards) were located in Quadrant IV, confirming their role as independent or driving variables they have high influence over the system with minimal dependency. In contrast, variables V8 (Worker Well-being), V9 (Economic Security), and V10 (Job Commitment) fell into Quadrant II, verifying their classification as dependent variables that are influenced by almost all other factors. The middle-tier variables V4, V5, V6, and V7 occupied Quadrant III, confirming their status as linkage variables, characterized by both high driving and high dependence power. Notably, no variable fell into Quadrant I, indicating that the system is highly interconnected, with no element functioning independently.

The ultimate ISM model and digraph shown above further illustrate this hierarchical structure, with fundamental, 'root' nodes (in the form of flexibility, financial security and working conditions) having a direct impact on regulatory actions, company practices, and matters of a financial nature, such as precarity and reliance on the platform. These, in turn, shape gig workers' most important health outcomes, including mental health, economic security and continued work engagement. The dynamic process of intermediaries means that the well-being of gig workers is not a dissociated and contingent effect, but the combined, time-lagged, and dialectic result of an interrelated system of institution, operation, and environment. This causal hierarchy highlights the need for improving upstream factors to yield significant downstream improvements in worker experience and safety.

Structural Self-Interaction Matrix (SSIM)

Variables	1	2	3	4	5	6	7	8	9	10
WF(V1)		O	O	V	V	O	O	V	V	V
IS(V2)			O	V	V	O	O	V	V	V
OH(V3)				V	V	O	O	V	V	V
EP(V4)					O	O	O	V	V	V
WP(V5)						O	O	V	V	V
PD(V6)							O	V	V	V
RI(V7)								V	V	V
WW(V8)									X	X
ES(V9)										X
JC(V10)										

Fig. 1. The Structural Self-Interaction Matrix.

Reachability Matrix(RM)

Variables	1	2	3	4	5	6	7	8	9	10	Driving Power
WF(V1)	1	0	0	1	1	0	0	1	1	1	6
IS(V2)	0	1	0	1	1	0	0	1	1	1	6
OH(V3)	0	0	1	1	1	0	0	1	1	1	6
EP(V4)	0	0	0	1	0	0	0	1	1	1	4
WP(V5)	0	0	0	0	1	0	0	1	1	1	4
PD(V6)	0	0	0	0	0	1	0	1	1	1	4
RI(V7)	0	0	0	0	0	0	1	1	1	1	4
WW(V8)	0	0	0	0	0	0	0	1	1	1	3
ES(V9)	0	0	0	0	0	0	0	1	1	1	3
JC(V10)	0	0	0	0	0	0	0	1	1	1	3
Dependence Power	1	1	1	4	4	1	1	10	10	10	

Fig. 2. Reachability Matrix.

Final Reachability Matrix(FRM)

Variables	1	2	3	4	5	6	7	8	9	10	Driving Power
WF(V1)	1	0	0	1	1	0	0	1	1	1	6
IS(V2)	0	1	0	1	1	0	0	1	1	1	6
OH(V3)	0	0	1	1	1	0	0	1	1	1	6
EP(V4)	0	0	0	1	0	0	0	1	1	1	4
WP(V5)	0	0	0	0	1	0	0	1	1	1	4
PD(V6)	0	0	0	0	0	1	0	1	1	1	4
RI(V7)	0	0	0	0	0	0	1	1	1	1	4
WW(V8)	0	0	0	0	0	0	0	1	1	1	3
ES(V9)	0	0	0	0	0	0	0	1	1	1	3
JC(V10)	0	0	0	0	0	0	0	1	1	1	3
Dependence Power	1	1	1	4	4	1	1	10	10	10	

Fig. 3. Final Reachability Matrix.

Level Partitioning(LP)

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1,	1,	1,	3
2	2,	2,	2,	3
3	3,	3,	3,	3
4	4,	1, 2, 3, 4,	4,	2
5	5,	1, 2, 3, 5,	5,	2
6	6,	6,	6,	2
7	7,	7,	7,	2
8	8, 9, 10,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10,	8, 9, 10,	1
9	8, 9, 10,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10,	8, 9, 10,	1
10	8, 9, 10,	1, 2, 3, 4, 5, 6, 7, 8, 9, 10,	8, 9, 10,	1

Fig. 4. Level Partitioning table**.**

Level Partitioning Iterations

Elements(Mi)	Reachability Set R(Mi)	Antecedent Set A(Ni)	Intersection Set R(Mi)∩A(Ni)	Level
1	1,	1,	1,	3
2	2,	2,	2,	3
3	3,	3,	3,	3
4		1, 2, 3,		2
5		1, 2, 3,		2
6				2
7				2
8		1, 2, 3,		1
9		1, 2, 3,		1
10		1, 2, 3,		1

Fig. 5. Iteration validated.

Conical Matrix(CM)

Variables	8	9	10	4	5	6	7	1	2	3	Driving Power	Level
8	1	1	1	0	0	0	0	0	0	0	3	1
9	1	1	1	0	0	0	0	0	0	0	3	1
10	1	1	1	0	0	0	0	0	0	0	3	1
4	1	1	1	1	0	0	0	0	0	0	4	2
5	1	1	1	0	1	0	0	0	0	0	4	2
6	1	1	1	0	0	1	0	0	0	0	4	2
7	1	1	1	0	0	0	1	0	0	0	4	2
1	1	1	1	1	1	0	0	1	0	0	6	3
2	1	1	1	1	1	0	0	0	1	0	6	3
3	1	1	1	1	1	0	0	0	0	1	6	3
Dependence Power	10	10	10	4	4	1	1	1	1	1		
Level	1	1	1	2	2	2	2	3	3	3		

Fig. 6. The Conical Matrix.

Reduced Conical Matrix(CM)

Variables	8	9	10	4	5	6	7	1	2	3	Driving Power	Level
WW(V8)	1	1	1	0	0	0	0	0	0	0	3	1
ES(V9)	1	1	1	0	0	0	0	0	0	0	3	1
JC(V10)	1	1	1	0	0	0	0	0	0	0	3	1
EP(V4)	1	1	1	1	0	0	0	0	0	0	4	2
WP(V5)	1	1	1	0	1	0	0	0	0	0	4	2
PD(V6)	1	1	1	0	0	1	0	0	0	0	4	2
RI(V7)	1	1	1	0	0	0	1	0	0	0	4	2
WF(V1)	0	0	0	1	1	0	0	1	0	0	6	3
IS(V2)	0	0	0	1	1	0	0	0	1	0	6	3
OH(V3)	0	0	0	1	1	0	0	0	0	1	6	3
Dependence Power	10	10	10	4	4	1	1	1	1	1		
Level	1	1	1	2	2	2	2	3	3	3		

Fig. 7. Reduced Conical Matrix.

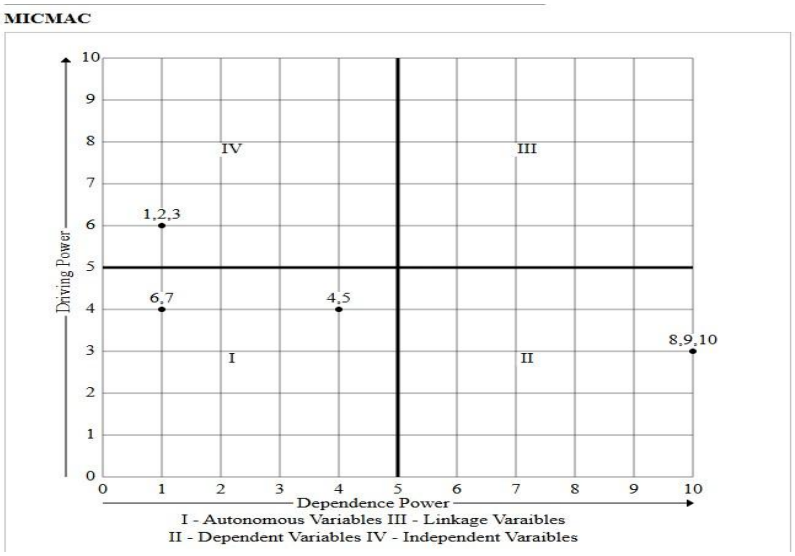

Fig. 8. MICMAC graph.

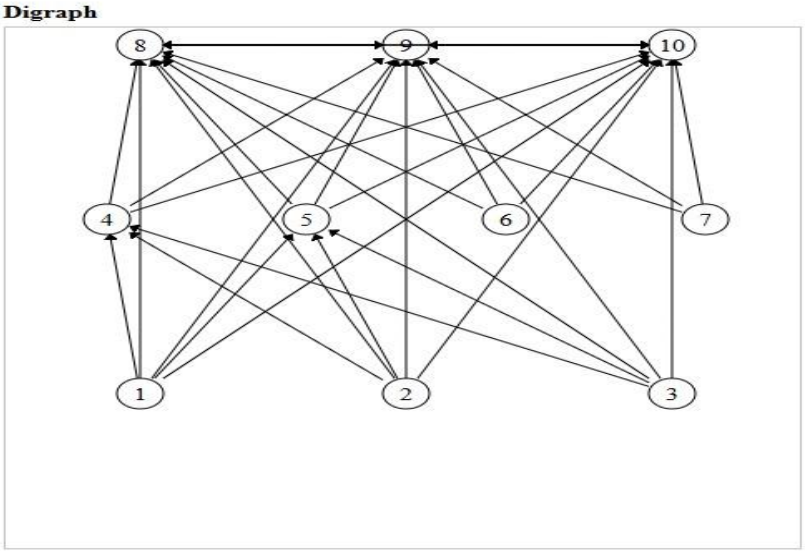

Fig. 9. The Digraph.

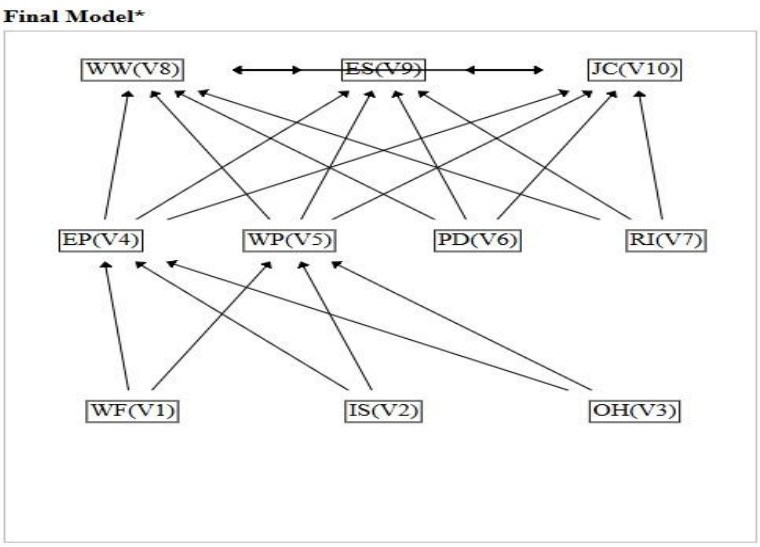

Fig. 10. Final Model.

3 Discussions

The results of the ISM and MICMAC reveal the systemic complexity of gig worker well-being, underlying the fact that individual experiences are influenced by an architecture of structural, economic and regulatory drivers. The localization of WW (V8), ES (V9) and JC (V10) at the peak of the ISM hierarchy verifies that these outcomes result from the provision of simple working conditions and institutional protection. This is consistent with the research in this space which situates gig work as necessarily precarious terrain, with autonomy, freedom and flexibility often rhetorical and failing to offset a lack of security or protection (Kincaid & Reynolds, 2024; Kurian & Madhavi, 2024) [12][13].

Central to the model were variables such as Economic Precarity (EP), Platform Dependency (PD) and Occupational Hazards (OH) that are identified as key intermediary constructs, illustrating the mechanisms underlying the way in which the underlying structural issues manifest themselves as well-being. These covariates reflect those of Chen et al. (2022) [5] and Morita et al. (2022) [16], who have described how freelancers deal with a combination of income insecurity, health hazards and algorithmic stress and subsequently long-term stable health.

Critically, Regulatory Interventions (RI) and Worker Protections (WP), while positioned in the mid-level of the hierarchy, are strategic levers of change. Their position indicates that although they do attend to certain operational factors, the diagnostic function they provide proves to be central here in materializing the effects from precarity and platform control. This complement research suggestions of state-based reforms and collective bargains as effective

strategies to challenge the exploitative nature of platform capitalism (Choudhary & Shireshi, 2022; Healy & Pekarek, 2020) [6][8].

The separation of Work Flexibility (WF) as an independent factor in the MICMAC analysis also disrupts the popular discourse on the gig economy. Despite being sold as a benefit, flexibility was not a significant cause for broader well-being outcomes. This observation parallels criticisms of Blázquez and associates (2024) [4] and Wan et al. (2024) [21], who claim that the flexibility in the gig economy is mostly an illusion, circumscribed by algorithmic schedules, income dependence, and lack of leverage.

In sum, the ISM model establishes that gig worker wellbeing is not a matter of personal resilience or performance, but a result of a multi-dimensional structure encompassing economic factors, policy gaps and platform governance. These findings suggest the importance of a policy and organizational response to gig worker insecurity that addresses the underlying causes and structural intermediaries of gig worker security.

3.1 Managerial Implications

Managerial and policy implications This study offers some managerial and policy implications for platform operators, human resources practitioners, and policymakers:

1. Institutionalized worker protection: Gig platform managers will need to actively design and implement safety nets, including accident insurance, mental health support, and grievance redressal. Studies have suggested that institutionalized protections can effectively protect individuals from the negative psychological consequences of flexible work (Au-Yeung et al., 2024; Mattila et al., 2024) [3][15].
2. Algorithmic Management as an Open Box: As platform-dependence is an important mediating variable, platforms should be more transparent in their algorithms and give workers more autonomy over accepting tasks and performance measurement. Opacities and punitiveness as a feature of algorithmic control contribute to increased levels of job stress and a loss of trust (Cram et al., 2020) [7].
3. Enhancing Earnings Stability Protections: To help solve this precarious economic situation, gig companies can add incentives like minimum earnings, predictable pay-outs, and tools to cushion the effect of income ups and downs. These may contribute to increased economic security and job involvement (Ng et al., 2024; Blázquez et al., 2024) [17][4].
4. Policy Collaboration and Advocacy: Platform companies should work with regulators to establish reasonable labor standards, instead of working against efforts for reform. Co-regulation is not only critical to increase platform legitimacy, but to sustain labor practices (Hsieh et al., 2023; Choudhary & Shireshi, 2022) [9][6].
5. Reboot the flexibility discussion: Brokers of flexibility must realign the word, with actual freedom. This overemphasis on flexibility without meaningful control erodes worker satisfaction and loyalty. Clear work choices, rest pauses, fair rating system should facilitate autonomy (Reid et al., 2023; Kurian and Madhavi, 2024) [19][13].

4 Conclusions

This paper - a one of its kind study analyses the structural dynamics affecting the well-being of the gig-preneurs through the process of Interpretive Structural Modeling (ISM) and MICMAC analysis. By expert consultation and analytical modelling, 10 important parameters were extracted and then hierarchically arranged to find the cause-effect relationships among them. They suggest that worker well-being, economic security, and commitment to one's job are not isolated experiences but are heavily influenced by building-block factors like income stability, workplace hazards, and work flexibility. These, in turn, are conditioned through structures like economic insecurity, platform reliance, regulatory interventions and the presence of labour protections.

The ISM hierarchy results revealed that income stability (IS), occupational hazards (OH) and work flexibility (WF) are one of the core determinants in the system. Both RI and WP became important mediating linkage variables between work conditions and outcome-level indicators. At the top of the model, worker well-being (WW), economic security (ES), and job commitment (JC) were reflected as highly influenced variables based on more than half of the other components in the system. These observations were supported by the MICMAC analysis that laid down the variables in correct zones of influence and dependence and gave additional insight in to systemic leverage points.

In sum, the study suggests that efforts to ameliorate gig worker welfare must be systemic not piecemeal, with an emphasis on institutional redesign, algorithmic compliance and equitable platform governance. Mere muddling through or task-based autonomy is not enough; sustainable progress needs systematic barriers and policy-directed supportive systems behind it. By highlighting the inter-related nature of these dimensions, this study offers a theoretically informed and practically useful framework to help improve labour outcomes in the rapidly changing gig economy environment.

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