

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

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Abstract: Purpose: The study investigates the association amid Workforce Agility (WFA) and employee perceived High-Performance Work System (HPWS) highlighting Employee Resilience (ER) as a mediator while Employee Experience (EE) as a boundary condition in knowledge intensive business service (KIBS) organizations, built on the AMO and JD-R framework.

Methodology: Study employed sequential exploratory mixed-methods approach (exploratory qualitative phase followed by quantitative assessment). Initially, semi-structured interviews were conducted with 30 employees from leading KIBS organizations in south India., to gain contextual insights and refine the questionnaire items. Further, a quantitative study employing a three-wave-time lagged survey was conducted among 350 employees to reduce common method bias. Research model was analysed using SPSS, AMOS and PROCESS macro (Model 14).

Findings: The results show that WFA improves HPWS through ER, with the effect becoming stronger at higher level of employee experience. The results highlights that resilience is a key mechanism linking workforce agility and performance system.

Novelty: The study suggest that organizations should develop HR practice that build adaptability and resilience, while tailoring strategies based on experience levels. The novelty of the study is exploring the employee resilience and experiences as mediating and moderating mechanism between WFA and HPWS.

Keywords: Workforce Agility, High Performance Work System, Employee Resilience Employee Experience, KIBS.

Introduction

In the prevailing business climate, organizations are increasingly confronted with Volatile, Uncertain, Complex and Ambiguous (VUCA) situation forcing organizations strategize and mobilize their resources in order to remain competitive and resilient (Kesumayani, 2026).

The growing complexity of business environment, driven by rapid technological advancement, ever-changing stakeholders' expectations and volatile incidents has increased complexity of business environment, which has drastically changed how organizations perceive and evaluate employee's adaptability, innovativeness and performance (Tiago and Almeida, 2026). Under such instances, employees must be equipped to navigate change and learn to cope up. This change is particularly evident in Knowledge Intensive Business Services (KIBS) organizations which is driven through professional-technical skills (Brodzicki, 2024). According to (Miles, 2008), KIBS are classified into two groups - professional services (P-KIBS) which includes services like business and management consulting, legal activities, accountancy and marketing research, Technological services (T-KIBS) consist services like information and communication technologies, IT enabled services, engineering, research and development consultancy. IT-BPM sector under T-KIBS is anticipated to reach \$315 billion in 2026 with steady growth and raising demand for digital services (IBEF, 2024; NASSCOM, 2026). In similar ways, P-KIBS are experiencing exponential growth highlighting the ever-growing economic significance of KIBS in India.

Organization must rethink ways to manage their workforce in response to the rapid growth of KIBS and its raising strategic demands. Though traditional methods of working are no longer sufficient. Organizations need employees who can adapt swiftly and thrive well in uncertain conditions. This makes workforce agility an essential capability to foster performance. Workforce Agility (WFA) refers to how well employees adjust to shifts in their work environment while keeping their performance on track, (Al Hammouri et al., 2023). Agile organization requires employee who can respond to evolving demand and contribute to innovation (Muduli, 2017; Beatty, 2005), employees are expected to be proactive, resilient and technologically advanced in the rapidly changing circumstances (Varshney et al., 2020; Ali et al., 2023). Thus, the growing demand for adaptability has sparked scholarly interest in WFA as a vital characteristic for sustained performance in competitive environments (Muduli, 2015).

To translate workforce agility into enduring efficiency and effectiveness, organizations rely on High Performance Work Systems that align employee capabilities with strategic goals. Given the uniqueness of the KIBS organization, the effectiveness of HR management systems such as High-Performance Work Systems (HPWS) becomes particularly important. HPWS is an integrated bundle of HR processes aimed at promoting employees' ability, motivation, and opportunity for enhanced results (Edgar et al., 2021). Accordingly, the present study examines HPWS from the employee perspective recognising that employees are the primary recipients of HR practices and are therefore well positioned to evaluate their implementation. In knowledge intensive firm, HPWS tends to work well due to its structured and innovative nature (Hanu et al., 2023), HPWS draws on a mix of HR practices and work design processes that when applied together in a right combination it complements each other and generate outcome that goes beyond what individual practices can achieve alone. According to (Hanu et al., 2023; Bharath et al., 2024) HPWS should be supported by a workforce that can readily adjust to new change, recover from setbacks, and strike a balance between routine implementation and innovation. Scholars have drawn attention of employee-level processes, such as employee resilience, as mediation that enables individual to maintain HPWS under pressure (Chu et al., 2023; Kumkale, 2022). Employee Resilience (ER) on the other hand allows employees to rebound from failure, respond to adversity, and maintain performance under stress (Näswall et al., 2015; Hillmann & Guenther, 2021). Resilient employees tend to bounce back from setbacks more quickly and with great effectiveness, as they are highly receptive to organizational dynamics, which is a key element for organisational success (Tonkin, et al., 2018). Importantly, this adaptation is not dependent on employees' positive attitude towards workplace changes rather, individual-level resilience improves the capacity to absorb changes even when they are not necessarily desired (Wanberg & Banas, 2000). While employee resilience improves performance under stress, its effectiveness may vary across individuals. Employee experience

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

acts as moderator to understand the boundary condition that influence how effectively resilience translates into a HPWS. Employees having prior experience are better able to utilize their resilience and thereby strengthen its impact on HPWS.

Despite increasing study on WFA, ER, and HPWS, these constructs have largely been researched in sectors like IT, hospitality, telecommunication, and healthcare, with scarce attention within the broader KIBS framework. Emerging economy like India, characterized by knowledge workers, rapid growth in service sector, and accelerated digital transformation, have also received limited attention. Given the above context, present study attempts to explore the relationship amid WFA and HPWS considering employee resilience as mediator and employee experience as moderator within KIBS context.

Theoretical Footing

Ability- Motivation- Opportunity (AMO) model is widely considered for explaining how employee capabilities explain HPWS (Appelbaum et al., 2000). The model advocates that, provided employees possess the essential abilities (skills, knowledge, and competency) and are motivated (both internally and externally) to utilize the opportunities, they participate in meaningful work activities (Obaid et al., 2022). This approach emphasizes how HR policies may strategically improve work performance creativity and adaptability. When applied to WFA, it can be seen as a thoughtful capability that strengthens employees' ability to be responsive towards changing demands, enhances motivation to engage proactively, and enables effective utilization of opportunity. As a result, WFA facilitates the effective implementation of HPWS by aligning employee capabilities with organizational goals.

The job demand-resource model (JD-R) offers a broader framework for explaining how employees manage the workplace issues by balancing job demand and resources. (Schaufeli, 2017). The job demand refers to the organizational, socio-psychological and physical characteristics of work which needs consistent effort and can result in burnout if not well handled (Bakker and Demerouti, 2014). Within this perspective, ER may be considered as vital resource that help employees to face the challenges in adapting to changes and sustain performance under pressure.

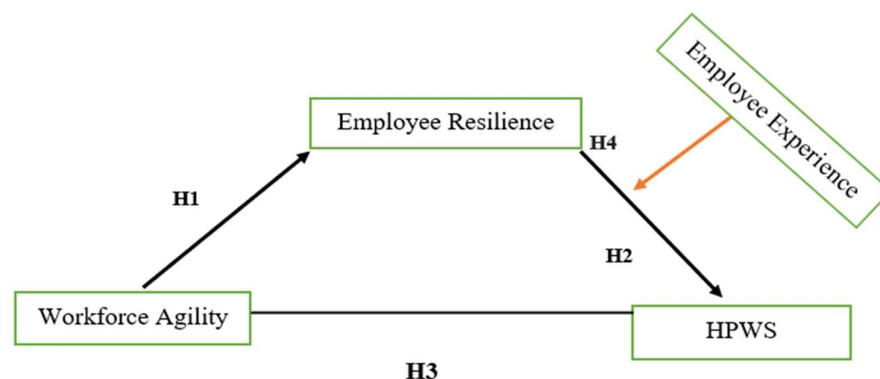


Figure 1. Hypothesized framework

Literature review

Workforce Agility and Employee Resilience

WFA has emerged as a vital organisation competency in an era characterised by rapid technological innovation, volatile market and shifting client's demand, specifically in KIBS organization (Al Hammouri et al., 2023). WFA, may be defined as employee's ability to respond swiftly and efficiently to change while sustaining performance, encompasses dimension of proactivity, adaptability, collaboration and learning orientation (Muduli, 2017; Shetty et al., 2023). In strategic HRM resilience is closely linked to WFA and resilient employees are better able to alter their work practices and maintain their performance in dynamic circumstances. (Li et al., 2024). Research evidence consistently supports significant association amid WFA and ER. (Varshney and Varshney, 2020) found that agility had a strong correlation with emotional intelligence and performance among small entrepreneur firms in India, implying that agile behaviours reinforce psychological coping mechanism. In similar way, (Ali et al., 2023) discovered that organisations that foster agile competencies provide employees the proactive mindset required to cope with adversity. In KIBS organisation this connection becomes more important as employees have to constantly adapt to changing client demands without compromising on productivity. Additionally, (Panda and Singh, 2025) demonstrated how organisation virtuousness boosts pro-social behaviour and innovative performance through WFA and ER, confirming that both dimensions collaborate effectively in KIBS situation. Building upon the JD- R framework (Bakker & Demerouti, 2014), WFA serves as a unique resource that buffers against workplace demands allowing employees to bounce back from failure and maintain active participation. Agile workplace encourages proactive behaviour, adaptability and ongoing learning all of which improves employee's capacity to navigate ambiguity and stress (Alavi et al., 2023; Mohamad, 2024). Grounded on the relevance, Within KIBS organisation these agile behaviours enable employees to cope with knowledge intensive work demands and sustained performance under rapidly changing requirements (Miles, 2008; Shetty et al., 2023). Given this background, H₁ hypothesis is proposed.

H₁: WFA has a significant and positive effect on ER

Employee Resilience and High-Performance Work System

The concept "resilience" is evolved from the Latin word *resilier* meaning to bounce back which refers to individual's capacity to recover quickly, successfully in the adversity face (Holler et al., 2025). As a factor influencing organisational results, ER gained increasing scholarly interest. Unlike a personality trait, resilience is becoming more widely accepted has a versatile scale influenced by organisational resources, job design and managerial practice (Tonkin et al., 2018; Kim et al., 2024). The concept aligns with resource building logic found in HPWS. Consistent with the employee perspective in this study, the AMO framework suggests that resilient employees are better able to utilise the opportunities provided through HPWS by maintaining motivation, adapting to changing work demands and effectively applying organisational resources (Appelbaum et al., 2000; Edgar et al., 2021). Recent study has demonstrated a significant association between ER and HPWS (Chu et al. 2023). The meta-analytic study (Kumkale, 2022), demonstrated that HPWS strongly improves performance result with psychological resources serving as a key mechanism. According to Hanu and Khumalo, 2022, HPWS boosted organisational ambidexterity and resilience in knowledge intensive industrial setting highlighting the potential of performance-oriented HR bundles to develop resources. Further research (Plimmer et al., 2021; Kim et al., 2024), found that resilience increases the coherence between ER and HPWS by enabling individuals to efficient in using organisational resources. Resilient employees are also better able to apply and sustain knowledge in challenging situation enabling them to utilise HPWS practice effectively (Kim et al., 2024). Given this background, H₂ hypothesis is proposed.

H₂: ER has a significant and positive effect on HPWS

Workforce agility and High-Performance Work System

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

Workforce Agility (WFA) refers to the capability of employee to perform quickly to meet the changes in the task, roles and work environment without compromising on productivity, (Muduli, 2017; Alviani et al., 2024). They are proactive, eager to take new responsibilities, and capable of developing new ideas (Afandi et al., 2019). This suggest that WFA not only involves adaption but associated with continuous learning, flexibility and commitment to organisational goals (Alavi et al., 2014). (Al Hammouri et al. 2023; Franco and Landini, 2022), employees who possess agile capabilities are more likely to responds to disturbance, foster creativity and flexibility in unpredictable and rapidly evolving organizational context. These agile competencies are closely linked with HPWS which refers to HR practices that are designed to improve employee's ability, motivation and opportunity (Lepak et al., 2006; Chadwick et al., 2018). The association between WFA and HPWS can be understood through AMO model (Appelbaum et al., 2000), which suggests that individual performance increases when they possess the necessary ability, motivation and opportunity. consistent with the employee perceived HPWS perspective, present study conceptualises HPWS as employee's evaluation of HR practices that strengthens their ability motivation and opportunity while creating a work environment that supports continuous learning, participation and adaptability (Edgar et al., 2021). Accordingly, WFA enhances HPWS by enabling employees to effectively use their skills, opportunity and motivation in changing work environment. In knowledge intensive organisations, workforce agility also promotes knowledge sharing and continuous learning thereby strengthening the effectiveness of HPWS (Miles, 2008; Edgar et al., 2021). Based on the relevance, H₃ is proposed.

H₃: WFA has a significant and positive effect on HPWS.

Workforce agility, High-Performance Work System, Employee Resilience

The influence of agility on employee resilience and HPWS have been proven separately. Nevertheless, the process of how agility impacts performance through this mediation needs further exploration. From a theoretical standpoint, mediation can be justified using JD-R model and AMO perspective. Agility increases employee's resilience as a personal resource and allows them to participate productively in HPWS. According to Mohamad, 2024, adoption of agile workforce practices increases employee's ability to engage in proactive behaviour associated with job crafting, including, HPWS practices. Additionally, (Panda and Singh, 2025), results support the resilience as a mediator amid organisational capabilities and performance in dynamic context. (Kim et al., 2024) concluded that employees could use their resilient qualities to leverage organisational resources and remain engaged in HPWS while dealing with challenges. (Hefferman and Dundo, 2016) proved that psychological and organisational wellbeing mechanism mediated HR system performance. By allowing flexibility and quick adaptability to changing needs, WFA improves employee capacity to cope with obstacles and recover from setback encouraging resilience. Employees possessing higher resilience are able to maintain better engagement and use organisational practise effectively resulting in better individual and organisation outcome. Within the realm of KIBS, employees undergo constant pressure and change, resilience is the vital factor that acts as a connector between WFA and HPWS. Without resilience, agility may not result in effective HPWS especially under conditions of stress and ambiguity. Therefore, employee resilience enables agile employees to effectively apply their knowledge and utilise HPWS practices under changing work condition (Panda and Singh, 2025). Based on the literature, H₄ is proposed

H₄: ER mediates the relationship between WFA and HPWS.

Employee Experience, Employee Resilience, High-Performance Work System

According to (Cheng and Cho, 2021; Kim et al., 2021), experience is the amount of time and effort an individual has put into completing job related task, which results in improved comprehension and competency in handling responsibilities at work. Employees with increased experience have higher

problem-solving abilities subject knowledge and coping mechanism making them capable of handling obstacles at work. HPWS experience is crucial in determining how ER translate into performance outcome. Experienced workers can use resilience effectively in stressful work context, but early career employee may lack the practical understanding needs to fully exploit HR policies like participation and decision making. Recent studies suggest that personal resources such as resilience interact with organisational practice to influence employee performance and adaptability (Kim et al., 2021; Singh et al., 2022). Employees with greater work experience possess rich organisational knowledge, enabling them to utilise resilience more effectively when responding to HPWS practices (Cheng and Cho, 2021). Based on the relevance, hypothesis, H5 is proposed.

H5: Employee Experience moderates the relationship between ER and HPWS.

Methodology

The study employed sequential exploratory mixed-methods approach; semi- structured interviews were conducted with 30 employees from leading knowledge intensive business services organisation in south India to gain contextual insights and refine the questionnaire items. Data was then collected using a three-wave-time lagged survey (e-survey) method to mitigate the common method bias (Podsakoff et al., 2003), with each wave administered at three-week intervals to establish temporal separation. At time 1 demographic status and measures of WFA were collected. At time 2, the same respondents completed the measurements scale of employee perceived HPWS, at time 3 the respondents completed ER scale, Participation was voluntary and respondents were assured confidentiality and anonymity throughout the study. A total of 480 questionnaires were distributed out of which 350 valid responses were retained from statistical analysis representing the response rate of 85%. The measurement model was assessed using SPSS, AMOS and PROCESS macro (Model 14).

Sampling Framework

The sampling framework consists of employees working in KIBS sector in South India and convenience sampling approach was used. The study focuses on medium and large size organization where professional and technical knowledge plays a significant role. The study is conducted in the Indian context representing an emerging knowledge economy. The sampling framework includes T-KIBS (Technology based) and P-KIBS (Professional services) according to the NACE classification. The sample framework involves respondents from corporations (7%), large companies (26%), medium-scaled organisations (67%). The study involves KIBS organization working for research and development (8%). Digital / AI organisations (13%), Information Technology Services companies (12%), Operations and management consultants (17%), engineering companies (17%), HR consulting firms (10%) also other organizations involved in technical operations (23%). Among the respondents, 209 employees were male, 141 were female. The age group of individuals varies from 25 to 55 years (< 25: 09, 26- 35: 225, 36- 55: 113, >56: 03).

Instrument Development

The current research explores three main constructs: Workforce Agility (WFA), High Performance Work System (HPWS), Employee Resilience (ER). To assess WFA, the 20-item scale proposed by (Shetty et al., 2023) was modified, which includes four dimensions: proactivity, adaptability, collaboration, and learning orientation. Employee perceived HPWS was measured through AMO framework suggested by (Tian et al., 2016), consisting of 23 items under three categories: ability, motivation, and opportunity. Employee Resilience was measured using the 9 items scale (EmpRes- Näswall et al., 2015). Pilot study was carried with 30 knowledge workers from the KIBS organizations to assess clarity, ease of the understanding and appropriateness of the instruments. Minor modifications were made considering the respondents' feedback. The Cronbach's alpha for all the construct was exceeded 0.70 (Nunnally, 1978) confirming the adequacy.

Sample adequacy test

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

Kaiser-Meyer-Olkin (KMO) was used to measure the sample adequacy which is 0.981, indicating the suitability for factor analysis. Furthermore, the Bartlett's Test of Sphericity ($\chi^2 = 20461.367$, $df = 861$, $p < 0.001$) indicates the non - identity matrix. Therefore, the results confirm that dataset is suitable for performing EFA.

Exploratory Factor Analysis

Table 1: Total variance explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% Variance	of Cumulative %	Total	% Variance	of Cumulative %	Total	% Variance	of Cumulative %
1	25.424	60.532	60.532	25.424	60.532	60.532	13.883	33.056	33.056
2	5.185	12.346	72.878	5.185	12.346	72.878	11.946	28.442	61.497
3	2.535	6.036	78.914	2.535	6.036	78.914	7.315	17.416	78.914
4	.893	2.125	81.039						
5	.844	2.009	83.048						
6	.649	1.545	84.593						
7	.575	1.368	85.961						
8	.527	1.256	87.217						
9	.280	.666	87.883						
10	.265	.630	88.513						
11	.252	.600	89.113						
12	.240	.571	89.684						
13	.238	.566	90.250						
14	.233	.554	90.804						
15	.225	.535	91.339						
16	.217	.516	91.855						
17	.205	.489	92.344						
18	.201	.480	92.824						
19	.193	.459	93.283						
20	.180	.429	93.712						
21	.174	.415	94.128						
22	.169	.402	94.529						
23	.159	.379	94.908						
24	.152	.363	95.271						
25	.145	.345	95.616						
26	.144	.342	95.958						
27	.140	.333	96.291						
28	.131	.311	96.602						
29	.125	.298	96.900						
30	.121	.288	97.188						
31	.119	.283	97.471						
32	.117	.278	97.749						
33	.116	.276	98.025						
34	.108	.257	98.282						

35	.104	.249	98.531						
36	.102	.244	98.775						
37	.096	.228	99.002						
38	.091	.217	99.220						
39	.088	.210	99.430						
40	.085	.203	99.633						
41	.079	.188	99.821						
42	.075	.179	100.000						
Extraction Method: Principal Component Analysis.									

Outcome of EFA (PCA with Varimax Rotation) show that 3 components possess eigenvalues greater than 1, suggesting the presence of three significant underlying factors in the dataset. The first component (eigenvalue - 25.424; 60.53% of the total variance), second component (eigenvalue - 5.185; 12.35% of the variance), third component (eigenvalue- 2.535, 6.04% of the variance), collectively explain 78.91% of the (cumulative variance) higher than the threshold of 60% for social science (Table 1). Thus, the three components indicated in table 1 is considered for further analysis to measure the construct, workforce agility. All 18 items (WA1–WA18) loaded strongly on factor 1, loadings range between 0.793 to 0.855, confirming these items. Similarly, the 15 items of High-Performance Work System (HPWS1–HPWS15) loaded significantly on factor 2, loadings range between 0.780 and 0.831, representation of the HPWS construct. Furthermore, the 9 items of Employee Resilience (ER1–ER9) loaded clearly on factor 3, factor loadings range between 0.745 to 0.805, capturing the constructs employee resilience (represented in Table 1). Overall, the rotated factor structure confirms that the measurement items are appropriately grouped under their respective constructs WFA, HPWS, ER thereby providing empirical support for the theoretical framework of the study. Also, for advanced analysis (CFA and SEM).

Table 2: Rotated component with item loading Confirmatory Factor Analysis (CFA)

Factors	Sym bols	Items	Item Loading
Workforce Agility	WA1 3	I receive the required information to carry out my job	0.855
	WA1 4	I have clear goals (set by superior) to achieve	0.843
	WA4	I recognize new business opportunities	0.829
	WA5	I acquire new skills in a timely manner	0.826
	WA1 2	My co-workers help out each other in resolving technical matters	0.824
	WA1	I act quickly on client needs	0.819
	WA2	I have no problem moving across projects	0.817
	WA1 1	My colleagues share information with one another	0.816
	WA9	There is alignment of different departments in my organization	0.816
	WA6	I am involved in making decisions (Work)	0.814
	WA1 0	My organization prefers internal employees for higher position	0.809
	WA1 5	I know how my job contributes to overall objectives	0.807

Can Workforce Agility Reinforce High-
Performance Work Systems in KIBS? An
Integrated AMO–JD-R Perspective

	WA8	I have the access to internal collaboration with colleagues	0.804
	WA3	I assimilate to new work environments	0.804
	WA18	I make efforts to prepare for future challenges / opportunities in my work.	0.803
	WA16	I would like to solve problems in my work environment.	0.800
	WA17	I actively seek opportunities to develop skills / knowledge beyond the requirements of my current role.	0.797
	WA7	I am given the opportunity to offer suggestion improvements	0.793
High Performance Work System	HPWS1	My organization is committed to hiring competitive employees.	0.831
	HPWS5	Performance appraisals offer specific feedback on how I can improve my performance.	0.830
	HPWS8	My organization provides need- based training.	0.818
	HPWS4	My organization offers training to enhance my job performance.	0.810
	HPWS15	My organization offers training to help me learn new methods.	0.806
	HPWS6	Employee performance determines training needs	0.805
	HPWS7	My organization provides me with sufficient opportunities for learning and development.	0.804
	HPWS10	My organization offers pay that is competitive than what our competitors provide.	0.802
	HPWS11	I feel my job is secure.	0.800
	HPWS12	Bonus are closely linked to individual performance.	0.798
	HPWS13	Bonus are closely linked to group performance.	0.797
	HPWS3	Formal training programs are in place to equip new hires for upskilling to perform their jobs.	0.789
	HPWS9	My organization provides comprehensive training programs	0.783
	HPWS2	The selection process is rigorous to ensure the right recruits are chosen.	0.782
	HPWS14	Part of my compensation is tied with firm's financial performance.	0.780
Employee Resilience	ER8	I recognize the change as an opportunity for my growth.	0.805
	ER3	Mistake makes me to learn and improve my job.	0.803
	ER5	I respond positively to feedback at work.	0.788
	ER2	I am able to resolve conflicts at work.	0.783

	ER1	I manage high workload for long periods.	0.772
	ER4	I re-evaluate my performance and continually improve my work.	0.771
	ER6	I take support when I need resources at work.	0.761
	ER9	I remain calm and composed when facing stressful or unexpected situations.	0.758
	ER7	I request managers when I need their support.	0.745

The CFA result shows that the three-factor structure made up of WFA, HPWS, ER fits the data well confirming that the measurement model is valid and the model is represented in figure 2. The Chi-square value (CMIN) of 2318.139 with 804 degrees of freedom is statistically significant ($p < 0.001$), which is common in large samples. However, the CMIN/DF ratio of 2.883 falls within the recommended limit of less than 5, (Wheaton et al., 1977) indicating an acceptable model fit. Additionally, the GFI = 0.931 and AGFI = 0.998 exceed the recommended benchmark of 0.90, suggesting that the proposed model explains a substantial proportion of the variance in the observed data (Hair et al., 2019). The CFI = 0.926, IFI = 0.926 (Hu and Bentler, 1999) and TLI = 0.921 are all within the acceptable threshold of 0.90, indicating that the proposed model provides a significant improvement over the independence model. Although the NFI = 0.892 is slightly below the ideal threshold of 0.90, it is still considered acceptable in complex models with a large number of variables. Furthermore, the RMSEA value of 0.073 is within the recommended range of 0.05 to 0.08, indicating a reasonable approximation error and supporting the adequacy of the model (Browne and Cudeck, 1993). Thus, CFA results confirm that the three-factor measurement model demonstrates satisfactory goodness-of-fit and suitable for further structural model analysis, including mediation and moderation testing using Structural Equation Modeling (SEM).

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

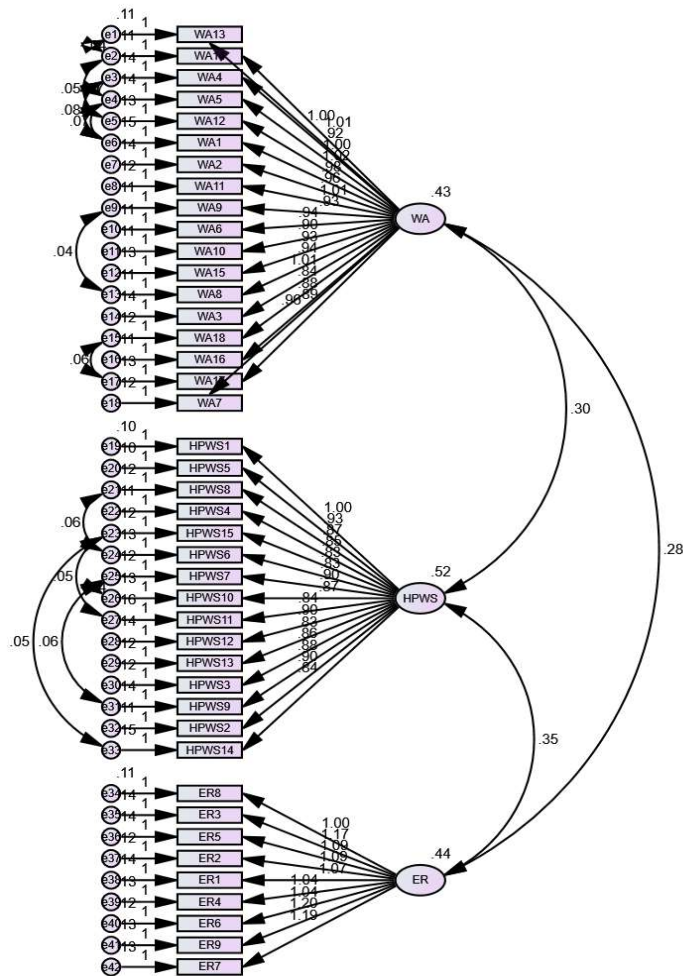


Figure 2: Measurement model of WFA, HPWS, ER

Validation of the instrument

Reliability and Convergent Validity of Constructs

To ensure reliability and convergent validity, the factors were assessed with Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Reliability refers to the internal consistency of the measurement items used to represent a construct; convergent validity examines the degree to which multiple indicators of a construct share a high proportion of variance. Cronbach's Alpha is used to assess internal consistency.

Composite Reliability (CR) delivers a more precise estimate of reliability in SEM. Convergent validity is evaluated through the Average Variance Extracted (AVE), (values greater than 0.50 is expected). These measures collectively ensure the constructs adopted in the study are reliable and valid endorsing the underlying theoretical concepts (Fornell and Larcker, 1981).

Table 3 : Reliability and Convergent Validity, Multicollinearity

Construct	Items	Cronbach's Alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)	Multicollinearity Assessment (VIF)
Workforce Agility	18	0.983	0.984	0.775	1.69
Employee Resilience	09	0.973	0.977	0.825	1.69
High Performance Work System	15	0.980	0.982	0.781	

The results (Table 3) indicate that all constructs show adequate reliability and strong convergent validity. The Cronbach's Alpha for WFA (0.983), ER (0.973), and HPWS (0.980) (above the threshold of 0.70), indicating internal consistency among the measured items. Similarly, CR values for WFA (0.984), ER (0.977), and HPWS (0.982) confirming the reliability of the constructs. In addition, AVE for WFA (0.775), ER (0.825), and HPWS (0.781) are significantly higher than the (minimum acceptable value of 0.50) indicating that the constructs explain a substantial proportion of the variance. These findings confirm that the measurement items converge effectively.

To assess multi-collinearity, the Variance Inflation Factor (VIF) was used for each predictor variable in the model. As shown in Table 4, the results of the multi-collinearity assessment reveal that all predictor variables were well within the acceptable limits. The VIF value for WFA is 1.69, while ER also records a VIF value of 1.69, indicating a low level of correlation among the predictors. The VIF value for experience is 1.00, which suggests that this variable is free from multi-collinearity issues. The results confirm that multi-collinearity is not a concern in the present study. Therefore, the predictor variables: WFA, ER, Experience can be included simultaneously in the regression and structural models without causing instability in the parameter estimates. This confirms that the model provides reliable and unbiased estimates of the relationships among the constructs, supporting validity of the mediation - moderation analyses.

Discriminant Validity

Discriminant validity assesses the extent to which a construct differs from other constructs within the model. According to the Fornell-Larcker criterion, discriminant validity is established when the square root of AVE for each construct is greater than the corresponding inter-construct correlations. This indicates that the construct shares variance with its own indicators than with other constructs in the model (Fornell and Larcker, 1981).

Table 4: Discriminant validity

Constructs	Workforce Agility	Employee Resilience	HPWS
Workforce Agility	0.880		

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

Employee Resilience	0.638	0.908	
HPWS	0.607	0.710	0.884

The results of the discriminant validity assessment (Table 4) presents that the square root of AVE values for WFA (0.880), ER (0.908), and HPWS (0.884) are greater than the correlations between the respective constructs. For instance, the square root of AVE for WFA (0.880) is higher than its correlations with ER (0.638) and HPWS (0.607). Similarly, the square root of AVE for ER (0.908) exceeds its correlations with WFA (0.638) and HPWS (0.710). Likewise, the square root of AVE for HPWS (0.884) is greater than its correlations with WFA (0.607) and ER (0.710). Consequently, the constructs of WFA, ER, HPWS are statistically distinct, endorsing validity of measurement model.

Common Method Bias

The results of Harman’s Single Factor Test indicate that the first factor accounts for 60.53% of the total variance before rotation. Although this factor explains the largest proportion of variance, the factor analysis reveals the presence of multiple factors rather than a single dominant factor, indicating that the variance is distributed across several constructs in the model. After rotation, the variance is evenly distributed among the 3 extracted factors representing WFA, HPWS, ER which collectively explain 78.91% of the total variance. These findings suggest that the measurement items do not load onto a single factor, and the observed relationships among constructs are not solely attributable to common method bias. Therefore, the dataset is appropriate for further analyses such as CFA, mediation, and moderated mediation testing.

Correlation Matrix

Correlation analysis was conducted to examine the strength and direction of the relationships among the key constructs included in the study (WFA, HPWS, ER).

Table 5: Correlation Matrix

Variables	1	2	3
Workforce Agility	1.000		
Employee Resilience	0.638	1.000	
HPWS	0.607	0.710	1.000

The results of the correlation analysis (Table 5) reveals positive and moderate relationships among the constructs included in the study. WFA shows a moderate positive correlation with ER ($r = 0.638$), indicating that employees who demonstrate higher levels of agility tend to exhibit greater resilience in the workplace. Similarly, WFA is positively correlated with HPWS ($r = 0.607$), suggesting that agile workforces contribute to effective implementation of HPWS within organizations. Furthermore, ER demonstrates the strongest correlation with HPWS ($r = 0.710$), indicating that resilient employees are likely to support and sustain HPWS. The positive relationships among these variables provide preliminary support for the hypothesized associations proposed in the study. Additionally, the correlation values are below the critical threshold of 0.80, suggesting that the constructs are related but not excessively correlated, thereby reducing concerns related to multicollinearity and ensuring the

distinctiveness of the constructs. Overall, the findings indicate that WFA, HPWS, ER are positively associated, supporting the theoretical framework of the study and justifying further analysis using mediation and moderation techniques.

Mediated moderation Analysis

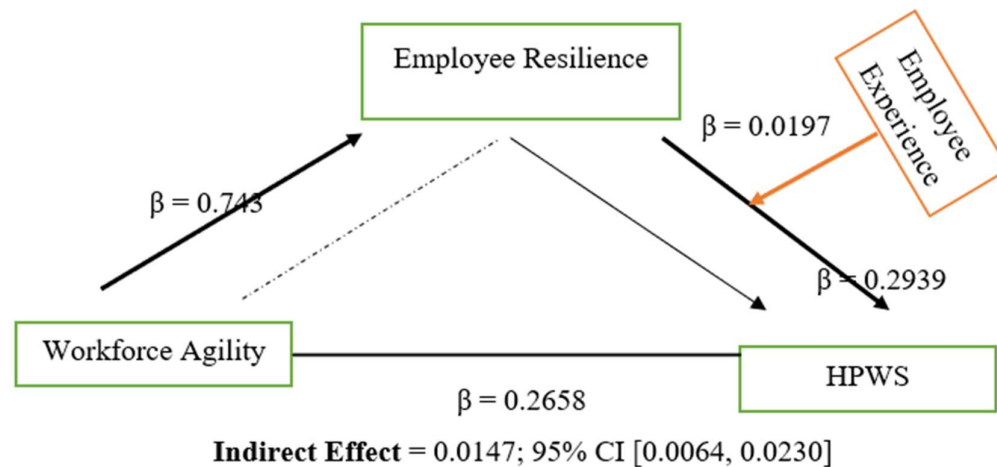


Figure 3: Mediation Moderation source

The results of the moderated-mediation analysis provide support for the proposed hypotheses. WFA has a significant and positive effect on ER ($\beta = 0.743$, $p < 0.001$), supporting H1, which states that workforce agility enhances employee resilience. Further, Employee resilience positively influences High Performance Work System ($\beta = 0.2939$, $p < 0.001$), supporting H2. While Workforce Agility also has a significant and direct effect on HPWS ($\beta = 0.2658$, $p < 0.001$), supporting H3. The mediation analysis shows that employee resilience significantly mediates the relationship between workforce agility and HPWS, as the indirect effects are significant across different levels of employee experience, thus supporting H4. Additionally, the interaction between employee resilience and employee experience is significant ($\beta = 0.0197$, $p < 0.001$), indicating that experience strengthens the positive relationship between employee resilience and HPWS, thereby supporting H5. Furthermore, the index of moderated mediation is significant (Index = 0.0147; 95% CI [0.0064, 0.0230]), confirming that the mediating effect of employee resilience becomes stronger as employee experience increases. Thus, all proposed hypotheses are supported by the empirical results.

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

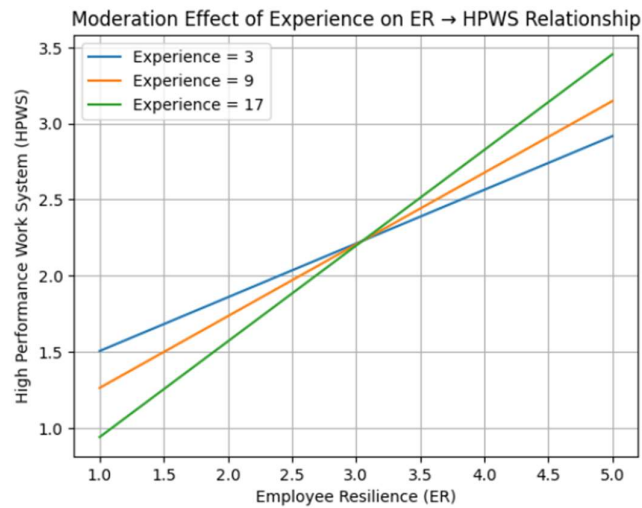


Figure 4: Interaction Plot

The interaction plot demonstrates that employee experience strengthens the positive relationship amid employee resilience and HPWS. Early career employees may exhibit resilience but they typically lack the practical exposure required to utilise it effectively in organisation settings. Consequently, the influence of resilience on HPWS demands constraint at this stage as employee may find it challenging to participate in decision making, respond positively to feedback or actively contribute to organisational operations. At moderate experience level, employee's demonstration more balanced and confident use of resilience, with growing professional experience employee participate confidently in collaborative task, engage in organisational practices, adjust to shifting demands and manage job constraint with greater competency. As experience increases further, the slope of the relationship becomes steeper, indicating that highly experienced employees are better able to translate their resilience into improved HPWS as employees exhibit consistent approach of resilience (handling complex task confidently, navigating ambiguity with composure) contributing significantly to enhanced organizational performance. As a result, with increasing level of experience, resilience is strongly associated with improved HPWS. This graphical representation further supports the presence of a significant moderation effect.

Discussion

The study contributes to a deeper understanding of the dynamic interplay between WFA, HPWS, ER, in shaping organizational effectiveness particularly in KIBS industry. Firstly, the study confirms a strong direct association between both WFA and HPWS. Consistent with prior study (Muduli, 2017) which demonstrated that agility enables employees to adapt to changing demands and sustained performance in knowledge intensive manufacturing and service organization in India. Similarly, (Alviani et al., 2024) found that WFA is a cross contextual driver of performance system in service-based industry in Indonesia. In KIBS environment where continual learning and flexibility are critical, WFA emerges as a fundamental driver of employee's positive perceptions and effective utilizations of HPWS. Secondly, WFA Shows a significant influence on ER, supporting (Li et al., 2024) study stating that flexible work environment improves employee's capacity to manage uncertainty, modify their approaches and overcome workplace obstacles within knowledge intensive firm in China. Thirdly, the indirect effect of WFA on HPWS through ER was confirmed indicating that ER plays a crucial mediating role. Previous study conducted in public sector and service-oriented sectors in western countries suggest that resilience help employee make use of organisational resources and maintain performance under stress. Resilient employees are likely to stay engaged and support HPWS (Plimmer et al., 2021; Kim et al., 2024). Fourthly, employee experience as a moderation offers additional information. The

results indicate that the relationship between ER and HPWS increases at higher level of employee experience supporting previous studies conducted in service-based sector, particularly in Asian settings. The experienced employees are better able to transform resilience into effective performance outcomes (Cheng and Cho, 2021; Kim et al., 2021). In KIBS industry where knowledge and expertise are a key factor, experience improve the capacity to exploit resilience when working with HPWS. Finally, the moderation mediation results shows that indirect effect of WFA on HPWS through ER is stronger among employees. This implies that resilience by itself is insufficient in KIBS context unless it is accompanied with experience that allow employees to use their skills effectively. Thus, the result indicate that employee experience strengthens the association amid WFA and employee perceived HPWS in KIBS industry, both directly and indirectly through employee resilience.

Conclusion

The dynamic interactions between WFA, HPWS, ER and employee experience within KIBS environment reveal that, rather than treating WFA as merely an outcome of HR practices, the study shows that agility enables employees to effectively engage with and benefit from existing HR system. In other words, having the right HR practise is not just enough, employee needs to be agile even under condition of adversity and uncertainty. The mediating role of ER adds another layer to this understanding; resilient employees do not cope better under pressure; they are more capable of turning their abilities and opportunity into high performance even when the conditions are difficult. This reinforce that employee resilience should not be treated as a soft skill but as a core driver for performance within the KIBS environment. The study found that as employee accumulate years of experience, their resilience becomes increasingly effective in driving employee perceived HPWS. Highly experienced employee who has navigated challenges over time is in better place to draw on their resilience purposefully than compared to a moderate or lesser experienced employee. In KIBS, where knowledge and expertise define how value is delivered, this distinction carries significant practical weight. Taken together the finding makes HRM approach that treats agility, resilience and employee perceived HPWS not as a separate initiative but as an interconnected priority. Organisation that builds these capabilities are likely to perform consistently in the VUCA business environment.

Theoretical Implication

This study advances HRM theory by conceptualizing a dynamic relationship among Workforce Agility, Employee Resilience, and HPWS. Drawing on the JD-R framework, the findings suggest that resilience operates as a critical personal resource enabling employees to cope with volatile work environments; however, the observed negative moderation effect indicates that resilience alone does not unanimously enhance HPWS outcomes. Instead, its effectiveness depends on contextual alignment with organizational structures. Complementing this perspective, the AMO model provides insight into how HR practices shape employees' abilities (adaptability), motivation (commitment and resilience), and opportunities (practices that enable agility). The study therefore highlights that HPWS is effective when HR architectures simultaneously nurture agility and resilience, while ensuring congruence between individual behavioral capacities and organizational design. By integrating JD-R and AMO perspectives, the research proposes a dynamic HRM framework that links agility-oriented capabilities with organizational systems, offering a theoretically grounded pathway for building future-ready high-performance work systems.

Practical Implication

The present research underscores the critical need for HR professionals to establish WFA as strategic cornerstone. Firstly, it is not just an attractive quality but a fundamental competence in the contemporary high speed business world. Practically, this involves HR professionals making determined efforts to develop adaptive behaviours (proactive learning, cross functional teamwork, and

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

change readiness). This can be done through institutionalizing cross functional collaboration system supported by agile coaches to facilitate sprint planning, remove bottlenecks and foster team work. In KIBS firms, where work is highly cognitive, client-driven, and project-based, agile coaches play a crucial role in embedding adaptive work practices. They enable rapid knowledge sharing, facilitate iterative problem-solving, and enhance cross-functional collaboration among experts. By guiding teams to respond effectively to evolving client requirements and high uncertainty, agile coaches strengthen employee resilience and ensure consistent, high-quality service delivery. Institutionalizing agile coaching within KIBS firms can thus bridge the gap between workforce agility and High-Performance Work Systems by aligning knowledge expertise with dynamic execution demands. Secondly, based on the prerequisite, HR leaders have added responsibility of developing ER as a force of stabilisation that guarantees the sustainability and continuity of agile behaviour. Resilience is not a voluntary but a critical support mechanism that allows employees to thrive not just survive under pressure for which, Organizational Development (OD) specialists may institutionalize structural resilience building interventions (adaptive leadership workshop) into a comprehensive HR ecosystem. When this resilience is rooted within an AMO-aligned HPWS, as noted by (Patel & Singh, 2023) employees are proficient of converting training into high-impact performance results, upholding motivation throughout turbulence, and make the most of on emergent opportunities. This alignment is particularly crucial in KIBS, where performance outcomes are closely tied to the effective application of knowledge and adaptive expertise. Thirdly, organizations particularly in KIBS, must recognize employee experience as a critical strategic lever that amplifies the effectiveness of both workforce agility and resilience. Finally, by linking these elements into a combined strategic HRM approach, organizations can cultivate a workforce that is not only agile or resilient, but also associated with high performance. These insights signal a critical shift to survive in disruption prone environment. Organization require a robust HPWS (holistic capability practices) such as, selective technical acquisition, continuous reskilling, decentralized decision making, performance congruent rewards, cross functional collaboration mechanism, agile coach and psychological safety) that is structurally adapted and strategically aligned to sustain resilience, agility and high-performance. A convincing way is the progress of a 'Future-Fit Workforce Development Model' that integrates agile challenges, resilience-building retreat into a clear and constant learning journey to thrive in unpredictable fast-paced global market.

Limitations and Future directions

Like other empirical study, the present research has certain limitation that provides direction for further research. Firstly, self-report measures were used to gather the data, which may introduce to common method variance and response bias (Podsakoff et al., 2012). Future studies are encouraged to employ multi-source approaches like dyadic data (supervisor–subordinate or peer dyads), to increase validity. Secondly, as the study is confined to the KIBS sector in south India, the generalizability of the findings may be limited. Future studies are encouraged to validate the applicability of the proposed model across diverse industry contexts and geographical regions, such as manufacturing, healthcare, and hospitality, as well as across different national settings, to enhance external validity. Lastly, the research examined employee experience as a moderator and employee resilience as mediator for deeper insights further studies may look at other factors like leadership style.

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Declarations

Ethical Approval: The confidentiality and anonymity of the participation were ensured and the data were securely stored.

Conflicts of Interest: The authors declare no competing interests.

Author Contribution: Shivali M and Sindu Bharath jointly contributed to the conceptualization, methodology, formal analysis, investigation, resource acquisition, data curation, original draft preparation, and review and editing of the manuscript. Both authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

References

- Al Hammouri, S., Bin, S., & Mohammed, H. (2023). The influence of agile HRMS on organizational performance: The case of Dubai government. *Uncertain Supply Chain Management*, 11(4), 1519-1526. <https://doi.org/10.5267/j.uscm.2023.7.017>.
- Alavi, S., & Aghakhani, H. (2023). Identifying the effect of green human resource management practices on lean-agile (LEAGILE) and prioritizing its practices. *International journal of productivity and performance management*, 72(3), 599-624. <https://doi.org/10.1108/IJPPM-05-2020-0232>.
- Ali, M., Zhang, L., Zhang, Z., Zada, M., Begum, A., Han, H., & Vega-Muñoz, A. (2021). Can leaders' humility enhance project management effectiveness? Interactive effect of top management support. *Sustainability*, 13(17), 9526. <https://doi.org/10.3390/su13179526>.
- Brodzicki, T. (2024). Global knowledge-intensive business services trade flows. The revealed competitive position of Europe and Central and Eastern Europe. *Quaestiones Geographicae*, 43(4), 151-167. <https://doi.org/10.14746/quageo-2024-0040>.
- Browne, M. W., & Cudeck, R. (1992). Alternative ways of assessing model fit. *Sociological methods & research*, 21(2), 230-258.
- Chadwick, C., & Li, P. (2018). HR systems, HR departments, and perceived establishment labor productivity. *Human Resource Management*, 57(6), 1415-1428. <https://doi.org/10.1002/hrm.21914>.
- Cheng, Y. S., & Cho, S. (2021). Are social media bad for your employees? Effects of at-work break activities on recovery experiences. *International Journal of Hospitality Management*, 96, 102957. <https://doi.org/10.1016/j.ijhm.2021>.
- Chu, X., Li, Y., & Wang, Z. (2023). High-performance work systems and organizational performance: The mediating role of employee outcomes. *International Journal of Human Resource Management*. <https://doi.org/10.1080/09585192.2013.781524>
- Edgar, Zhang, J.A and Blaker, N.M. (2021). The HPWS and AMO a dynamic study of system and individual-level effects. *International Journal of Manpower*, Vol.42 No.5, pp. 794-809. <https://doi.org/10.38203/jiem.024.2.0087>.
- Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E. (2019). *Multivariate Data Analysis*, 8th ed., Cengage Learning, London.
- Hanu, C., & Khumalo, S. (2022). High-performance work systems and organizational resilience: The mediating role of employee resilience and ambidexterity in Ghana's pharmaceutical manufacturing firms. *Journal of Organizational Effectiveness*.10 (2),123-140. <https://doi.org/10.1108/JOEPP-03-2023-0021>.
- Heffernan, M. and Dundon, T. (2016). Cross-level effects of high-performance work systems (HPWS) on employee well-being: the mediating role of organisational justice. *Human Resource Management Journal*, Vol. 26 No. 2, pp. 211-231. <https://doi.org/10.1111/1748-8583.12095>.
- Hillmann, J., & Guenther, E. (2021). Organizational resilience: a valuable construct for management research", *International journal of management reviews*, Vol.23 No.1, pp. 7-44. <https://doi.org/10.1111/ijmr.12239>.
- Hu, L.T. and Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling*, Vol. 6 No. 1, pp. 1-55, <https://doi.org/10.1080/10705519909540118>.
- India Brand Equity Foundation (IBEF). (2024). IT & BPM Industry in India. Retrieved from <https://www.ibef.org/industry/indian-it-and-ites-industry-analysis-presentation>
- Kaiser, H.F. (1974). An index of factorial simplicity", *Psychometrika*, Vol. 39, pp. 31-36.
- Kesumayani, H. (2026). High Performance Work Systems and Adaptive Performance: Evidence from Knowledge Intensive Organizations. *Jurnal Informatika Ekonomi Bisnis*, 42-46. <https://doi.org/10.37034/infec.v8i1.1349>.
- Kim, D. et al. (2021). Enjoy the pain that you cannot avoid: Investigation on the relationship between

Can Workforce Agility Reinforce High-Performance Work Systems in KIBS? An Integrated AMO–JD-R Perspective

- developmental job experience and employees' innovative behavior. *Journal of Business Research*, 126, 363–375. <https://doi.org/10.1016/J.JBUSRES.2020.12.064>.
- Kumkale, İ. (2022). High-performance work systems and organizational performance: A meta-analytic review. *Personnel Review*, 51(1), 1–20.
- Lepak, D.P.; Liao, H.; Chung, Y.; Harden, E.E. (2006). A conceptual review of human resource management systems in strategic human resource management research. *Res. Pers. Human. Resource Management*. 2006, 25, 217–271.
- Miles, I. (2008). Patterns of innovation in service industries. *IBM Systems journal*, 47(1), 115-128. [10.1147/sj.471.0115](https://doi.org/10.1147/sj.471.0115).
- Miles, I., Kastrinos, N., Bilderbeek, R., Den Hertog, P., Flanagan, K., Huntink, W., & Bouman, M. (1995). Knowledge-intensive business services: users, carriers and sources of innovation.
- Mohamad, A. A. (2024). The Impact of Workforce Agile Behavior on Organizational Innovation Performance for Manufacturing Enterprises. In *BUiD Doctoral Research Conference 2023: Multidisciplinary Studies* (pp. 396-404). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-56121-4_37.
- Muduli A. (2015). High performance work system, HRD climate and organisational performance: an empirical study. *European Journal Training Development*. 39:239–257. doi:10.1108/EJTD-02-2014-0022.
- Muduli, A., (2013). Workforce agility: Examining the role of organizational practices and psychological empowerment', *Global Business and Organizational Excellence*, 36 (5), 46-56. <https://doi.org/10.1002/joe.21800>.
- NASSCOM. (2026). Technology Sector in India: Strategic Review 2026. Retrieved from <https://nasscom.in/knowledge-center/publications/technology-sector-india-strategic-review-2026>.
- Näswall, K., Kuntz, J., Hodliffe, M., & Malinen, S. (2015). Employee resilience scale (EmpRes) measurement properties Resilient Organizations Research Programme Christchurch, New Zealand, pp. 1-4.
- P. Panda and P. Singh . (2025). Organizational virtuousness fosters innovative performance and pro-social behavior: examining the role of employee resilience and agility. *Journal of Organizational Change Management*. <https://doi.org/10.1108/jocm-02-2024-0073>.
- Tiago, F., & Almeida, A. (2026). Environmental, organizational, and individual determinants of AI adoption: A multilevel knowledge and analysis. *Journal of Innovation & Knowledge*, 13, 100934.
- Tonkin, K., Malinen, S., Näswall, K., & Kuntz, J. C. (2018). Building employee resilience through wellbeing in organizations. *Human resource development quarterly*, 29(2), 107-124. <https://doi.org/10.1002/hrdq.21306>.
- Varshney D, Varshney NK. (2020). Workforce agility and its links to emotional intelligence and workforce performance: a study of small entrepreneurial firms in India. *Global Business Organization Excellence*. 39(5):35–45. doi:10.1002/joe.22012.
- Wanberg, C. R., & Banas, J. T. (2000). Predictors and outcomes of openness to changes in a reorganizing workplace. *Journal of Applied Psychology*, 85(1), 132-142.
- Wheaton, B., Muthen, B., Alwin, D.F. and Summers, G.F. (1977). Assessing reliability and stability in panel models", in Heise, D.R. (Ed.), *Sociological Methodology 1977*, Jossey-Bass, pp. 84-136....