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Impact of Workplace Flexibility on Employee and Organizational Performance in the Manufacturing Industry: An Empirical Study of Demographical Construct

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Abstract

This comprehensive study rigorously explores the effects of flexible work schedules on workplace flexibility and their subsequent impacts on work-life balance and performance outcomes. It delves into the positive impacts of work-from-home policies and flexible work schedules on workplace flexibility and carefully examines how workplace flexibility influences work-life balance. The study further analyzes the significant effects of work-life balance on both employee performance and organizational performance. Additionally, it meticulously examines the moderating role of management intervention in the relationship between workplace flexibility and work-life balance, as well as the mediating effect of work-life balance between workplace flexibility and performance outcomes. The comprehensive demographic analysis of 460 respondents enhances the generalizability of the results. Factor analysis confirms the distinctiveness of various flexibility scales within the demographic data, while reliability analysis, using Cronbach's Alpha, demonstrates high internal consistency across different flexibility measures, thus upholding the validity of the study's findings. This research offers crucial insights for organizations aiming to enhance efficiency and competitiveness through improved flexibility, strategic integration, and robust organizational infrastructure..

Keywords: Manufacturing Flexibility, Organizational Infrastructure, Strategic Integration, Organizational Performance, Manufacturing Industry

Introduction

The workplace and employees have agreed on workplace flexibility. According to this agreement, better employee accommodations can change the standard work arrangement. Changes in working hours, location, and pattern have dominated workplace flexibility. A business values this strategic option because it changes employee working conditions and expectations. Flexibility in the workplace has helped boost employee attraction [1]. A regression analysis of 239 respondents by Emmanuel Olaniyi Dunmade [1] finds that job safety and the physical environment improve employee performance and creativity. In "Human Resource Flexibility and Organizational Performance: Evidence from Selected Manufacturing Firms in Southeast Nigeria," Agu Okoro Agu [2] found significant positive relationships between numerical, pay, and functional flexibility and organizational performance, recommending functional flexibility to meet market demands. Emmanuel Odiba Anaja [3] found that workplace flexibility and job sharing improve performance, but remote work hurts. Biswa Bhusan's [4] study, "Critically Analysing the Concept of Workplace Flexibility and Its Impact on Employee and Organizational Performance," found that workplace flexibility improves employee engagement, commitment, job satisfaction, and work-life balance despite sedentary behavior and high work pressure in India. Helmiatin's[5] workplace flexibility model requires qualitative research to understand its effects holistically. Based on an extensive Indian survey, Binal Mayank Shah's [6] "Workplace Flexibility to Improve Organizational Performance"

emphasizes flexibility strategies for aging employees and collaborative decision-making to boost performance. Nayanthara [7] study, "Impact of Flex-Work on Employee Performance: Study of Executive-Level Employees in IT Industry of Sri Lanka," shows that flex-work improves performance and suggests including more employee levels for more insights. In "Impact of Manufacturing Flexibility on Business Performance: Malaysian's Perspective," Kong Woun Tan [8] confirms the interdependence of manufacturing flexibility dimensions and the positive effects on business performance. In "The Influences of Workplace Environment, Job Satisfaction, and Organization Commitment on Job Performance in the Manufacturing Industry," Ahmad Nur Aizat Ahmad [9] links workplace environment and organizational commitment to job performance. Finally, Mansi Rastogi's [10] research in Industrial and Commercial Training, "Enhancing Quality of Work Life in India: The Role of Workplace Flexibility," found that flexibility in time and place improves work life, especially for married female employees, based on data from 380 middle-level Indian workers. These studies demonstrate the many benefits of workplace flexibility and a positive environment on employee performance, creativity, and organizational effectiveness, as well as the limitations of current research methods and scopes. Lalit Prasad [11] examines how work-life flexibility affects IT company performance. Work-life flexibility improves work performance, according to a Google form survey with a structured questionnaire and Likert scale. Notably, gender did not significantly affect work-life flexibility and performance. According to research, IT companies should improve work-life flexibility to boost employee performance. The study only covered Pune IT companies, excluding other sectors and regions. Organizational commitment, employee engagement, motivation, morale, attitude, and sincerity were also not covered. Future research should include these variables and other sectors and regions for a complete understanding. The study examined task performance, contextual performance, adaptive performance, and counterproductive behavior, highlighting the broad effects of work-life flexibility on employee performance. An empirical study of 212 manufacturing firms by Somen Dey [12] in the Global Journal of Flexible Systems Management examines organizational strategy and manufacturing flexibility. The study supports a theoretical framework for 20-dimensional manufacturing flexibility, emphasizing its importance for competitive organizations. Though comprehensive, the study lacks prominent examples of strategy-specific manufacturing flexibility and calls for more research. Tiago Duarte Dias [13] examines how advanced manufacturing technology (AMT) and organizational and environmental factors affect manufacturing flexibility. His literature review aims to help industrial practitioners implement manufacturing flexibility to address global competition and market uncertainties. Oksana Pavlova's [14] article presents a conceptual model of flexible working conditions. Pavlova emphasizes the need for legal regulation to renew labor codes to balance business, legal, and employee needs to maximize organizational value by analyzing scientific literature and secondary data. Luis Mendes'[15] structural equation modeling and confirmatory factor analysis show that employee skills improve operational performance and product flexibility. No direct effect of employee skills on volume flexibility suggests the need for alternative strategies. Parul Deshwal [16] found that flexible work arrangements boost productivity and dedication. Flexible workplaces use technology for virtual work connectivity to engage and satisfy employees. Hanen Khanchel Lakhoua's [17] article suggests a new work flexibility approach for production line balancing. The study validates the method experimentally, highlighting production management constraints. Racheal Muthoni Mwangi's [18] descriptive and correlation survey had 224 respondents and a 72% response rate. Work flexibility improves work-life balance and organizational performance, with job sharing boosting motivation and output. Priya Alat's [19] interviews with 20 middle- and senior-level executives show the need for flexibility and competencies. The study emphasizes coaching, conflict management, and systems thinking to increase leader flexibility. K. Karunarathna [20] uses the AMO model to assess high-performance work systems. The case study approach with quantitative and qualitative data analysis shows that improving work culture improves organizational performance despite higher production costs and dynamic market conditions. In the Global Journal of Flexible Systems Management, Kristina Höse proposes a method for evaluating Industry 4.0 solutions [21]. This approach supports transparent assessments tailored to different technological concepts to bridge Industry 4.0 and manufacturing flexibility. Cluster analysis by Santiago Gutiérrez Broncano [22] examines organizational flexibility and high-performance practices. The study emphasizes the link between high-performance practices and employee commitment, especially in flexible organizations. Kong Woun Tan's [23] dissertation examines how manufacturing flexibility improves business and manufacturing performance. The study examines these variables' interrelationships using cross-sectional survey methodology and correlational and regression analyses to inform manufacturing firms. Ruchi Mishra [24] in the Global Journal of Flexible Systems Management, calls for more research on manufacturing flexibility and other performance dimensions to fill gaps in the literature. Uzma Rasool Khan's [25] study shows that workplace environment, particularly psychological factors, affects employee performance. The Karachi manufacturing sector study uses descriptive survey design and close-ended questionnaires. David Ackah's [26] article emphasizes the importance of employee motivation in performance and the need to study specific motivational factors and their effects. Muhammad Nabeel Siddiqui [27] emphasizes the interrelationship between employee satisfaction and

performance, suggesting that organizations should focus on improving employee performance to remain competitive. Financial performance improves with flexibility, responsiveness, and Mohd Khairulnizam Zahari's [28]. A PLS-SEM analysis of 215 manufacturing companies' data provides insights into managing business operations during disruptions. Philip B. Whyman [29] examines the 2004 British Workplace Employment Relations Survey data. The study breaks down workplace flexibility practices into numerical, functional, and cost factors and finds that cost practices improve corporate performance. Using Herzberg's two-factor theory, Lydia Maket [30] examines how flexible working patterns affect organizational performance. The study emphasizes the need for flexible work patterns to manage a diverse workforce and boost performance.

The figure 1 illustrates a conceptual framework outlining the connections between independent variables, a mediator, and dependent variables within the context of workplace flexibility and work-life balance. On the left side of the diagram, the independent variables are outlined, such as "Flexible Work Options" and "Work From Home," which contribute to "Workplace Flexibility." This central concept is represented as a green circle with arrows pointing towards it from the independent variables, indicating their impact. The framework incorporates a management intervention, management intervention," acting as a moderating variable between "Workplace Flexibility" and "Work-Life Balance." The intervention is symbolized by an arrow leading from "Management Intervention" to "Work-Life Balance," indicating that management practices can affect the connection between flexibility and balance. Finally, "Work-Life Balance" influences the dependent variables, "Employee Performance" and "Organizational Performance." Arrows extend from "Work-Life Balance" to these outcomes, demonstrating that achieving a balance between work and personal life can enhance individual and organizational performance. Overall, this framework emphasizes the significance of flexible work arrangements and management interventions in promoting work-life balance and enhancing performance outcomes.

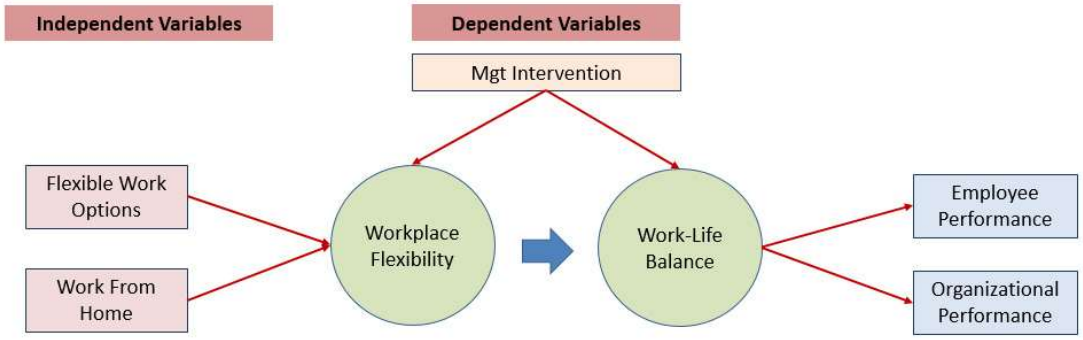

Figure 1. Model of Manufacturing Flexibility

Research Methodology

The research methodology utilized in the study is illustrated in Figure 2. This research looks at how different flexible work schedules affect workplace flexibility and how that affects work-life balance and performance results. It looks into whether work-from-home policies and flexible work schedules have a positive impact on workplace flexibility. It also aims to comprehend the important role that workplace flexibility plays in work-life balance and how work-life balance impacts organizational and employee performance. The study also looks at how management intervention affects the relationship between work-life balance and workplace flexibility. Additionally, it examines the moderating role that work-life balance plays in the relationship between workplace flexibility and the productivity of both individuals and the organization.

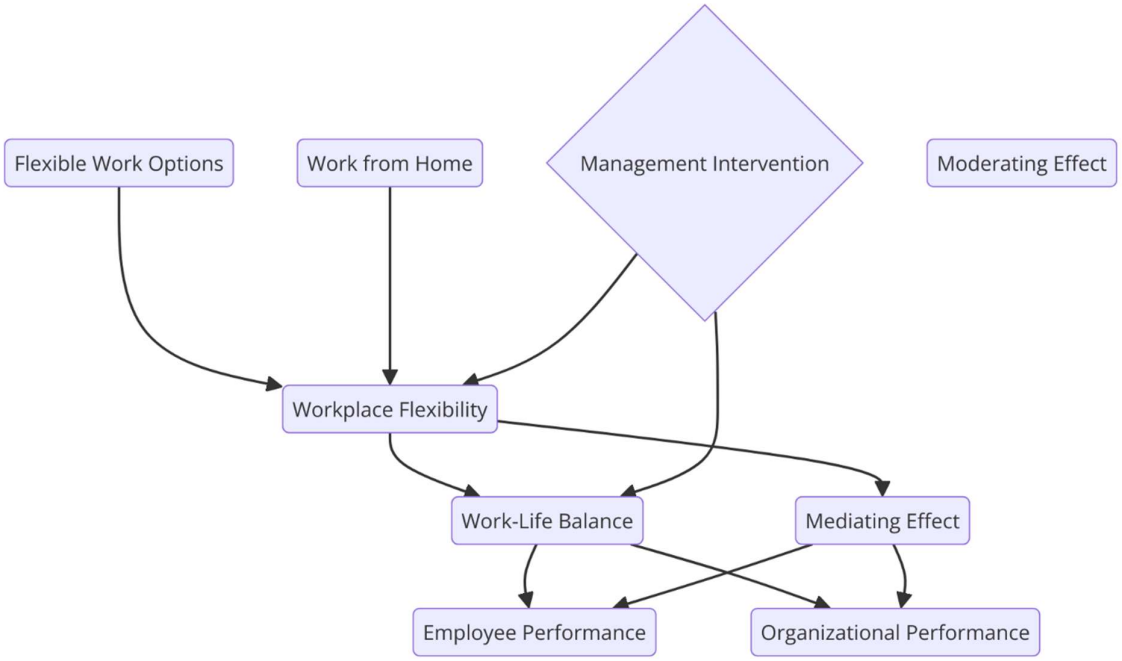

Figure 2. A Brief Overview of the Research Methodology

Respondent Demographics

The demographic distribution of the respondents, as presented in Table 1, provides a comprehensive overview of various demographic categories. The total number of respondents is 460. In terms of gender distribution, the majority are male, accounting for 54.34% (250 respondents), followed by females at 43.47% (200 respondents), and a small portion of respondents (2.17%) preferred not to disclose their gender. Analyzing the age group distribution, the largest segment falls within the 26-35 age range, making up 32.40% (150 respondents). This is followed by the 36-45 age group at 21.60% (100 respondents), the 46-55 age group at 19.44% (90 respondents), the 56+ age group at 15.76% (70 respondents), and the 21-25 age group at 10.80% (50 respondents). Regarding job roles, the most common positions are in production, with 25.92% (120 respondents), followed by sales and marketing at 19.44% (90 respondents), research and development at 15.12% (70 respondents), quality control at 12.96% (60 respondents), human resources at 10.80% (50 respondents), finance at 8.64% (40 respondents), and IT at 7.12% (30 respondents). The respondents' years of service show that 32.40% (150 respondents) have been working for 11-15 years, 21.60% (100 respondents) have been in service for 6-10 years, another 21.60% (100 respondents) for 16-20 years, 17.92% (80 respondents) for more than 20 years, and 6.48% (30 respondents) for less than 5 years. In terms of education level, the largest group of respondents, 43.20% (200 respondents), hold a graduate degree. This is followed by professional qualifications at 21.60% (100 respondents), post-graduates at 19.44% (90 respondents), those with certification courses at 10.80% (50 respondents), and doctorate holders at 4.96% (20 respondents). The overall data indicates that the most common education level among the respondents is graduate, with a predominantly male demographic and the largest age group being 26-35 years.

Table 1. Demographic Distribution of Respondents

Demographic Category	Sub-Category	Number of Respondents	Percentage (%)
Gender	Male	250	54.34
	Female	200	43.47
	Prefer not to say	10	02.17
Age Group	21-25	50	10.80
	26-35	150	32.40
	36-45	100	21.60
	46-55	90	19.44
	56+	70	15.76
Job Role	Production	120	25.92
	Quality Control	60	12.96

	Human Resources	50	10.80
	Research & Development	70	15.12
	Sales & Marketing	90	19.44
	Finance	40	08.64
	IT	30	07.12
Years of Service	Less than 5 years	30	06.48
	6-10 years	100	21.60
	11-15 years	150	32.40
	16-20 years	100	21.60
	More than 20 years	80	17.92
Education Level	Certification Course	50	10.80
	Professional	100	21.60
	Graduate	200	43.20
	Post Graduate	90	19.44
	Doctorate	20	04.96
Total Respondents: 460, Most Common Education Level: Graduate, Gender Distribution: Predominantly male (54%), Largest Age Group: 26-35 years			

Factor analysis

Factor Loadings Table (Table 2) shows the strength and direction of relationships between demographic categories and three underlying factors. Males have moderate positive loadings on Factor 1 (0.45), minor negative loadings on Factor 2 (-0.20), and slight positive loadings on Factor 3 (0.10). Girls have a moderate negative loading on Factor 1 (-0.50), a positive loading on Factor 2 (0.30), and a slight negative loading on Factor 3 (-0.15). Those who prefer not to disclose their gender have moderate positive loadings on Factors 1 (0.35), 2 (-0.25), and 3 (0.40). The 21-25 age group has a strong negative loading on Factor 1 (-0.60), a positive loading on Factor 2 (0.40), and a moderate positive loading on Factor 3 (0.30). Factor 1 has a moderate positive loading (0.50), Factor 2 has a negative loading (-0.50), and Factor 3 has a slight positive loading (0.20) for the 26-35 age group Factors 1 and 2 have slight positive loadings (0.20 and 0.10), while Factor 3 has a moderate negative loading (-0.40) for the 36-45 age group. Factor 1 has a moderate negative loading (-0.30), Factor 2 has a positive loading (0.50), and Factor 3 has a slight negative loading (-0.20) for the 46-55 age group Over 56s have slight positive loadings on Factor 1 (0.10) and Factor 3 (0.50), but negative loadings on Factor 2 (-0.30). As for departmental roles, production has a moderate positive loading on Factor 1 (0.25), a strong positive loading on Factor 2 (0.45), and a slight negative loading on Factor 3 (-0.10). Quality control loads slightly negatively on Factor 1 (-0.20), strongly positively on Factor 2 (0.50), and moderately positively on Factor 3 (0.20). Factor 1 (0.30), Factor 2 (-0.35), and Factor 3 (0.25), all have moderate positive loadings for human resources. The research and development show a moderate negative loading on Factor 1 (-0.40), a slight positive loading on Factor 2 (0.25), and a strong negative loading on Factor 3 (-0.50 Marketing and sales have a moderate positive loading on Factor 1 (0.45), a slight negative loading on Factor 2 (-0.20), and a moderate positive loading on Factor 3. Finance has moderate negative loadings on Factors 3 (-0.30) and slight positive loadings on Factors 1 (0.20) and 2 (0.40). IT loads moderately negative on Factor 1 (-0.50), slightly positive on Factor 2 (0.20), and moderately positive on Factor 3 (0.40). For those with less than 5 years of service, Factor 1 has a slight positive loading (0.10), Factor 2 has a negative loading (-0.30), and Factor 3 has a strong positive loading (0.60). With 6-10 years of service, respondents have a slight negative loading on Factor 1 (-0.20), a strong positive loading on Factor 2 (0.50), and a moderate negative loading on Factor 3 (-0.40). With 11-15 years of service, Factor 1 has a moderate positive loading (0.30), Factor 2 has a negative loading (-0.40), and Factor 3 has a slight positive loading (0.20). With 16-20 years of service, respondents have moderate positive loadings on Factors 1 (0.40) and 2 (0.30), but a strong negative loading on Factor 3 (-0.50). Over 20-year veterans have a slight negative loading on Factor 1 (-0.10), a slight positive loading on Factor 2 (0.20), and a moderate positive loading on Factor 3 (0.50). Certification course holders have a moderate positive loading on Factor 1 (0.50), a slight negative loading on Factor 2 (-0.20), and a moderate positive loading on Factor 3 (0.30). Professionals load Factor 1 (-0.30), Factor 2 (0.40), and Factor 3 (-0.50) moderately, positively, and strongly. Graduation has a slight positive loading on Factor 1 (0.20), a moderate negative loading on Factor 2 (-0.50), and a moderate positive loading on Factor 3. Post-graduates have moderate positive loadings on Factors 1 (0.30) and 2 (0.10) and slight negative loadings on Factor 3 (-0.20). Doctorate holders have a moderate negative loading on Factor 1 (-0.40), small positive loading on Factor 2 (0.20), and slight positive loading on Factor 3 (0.10).

Table 2. Factor Loadings Table

Demographic Category	Sub-Category	Factor 1 Loading	Factor 2 Loading	Factor 3 Loading
Gender	Male	0.45	-0.20	0.10
	Female	-0.50	0.30	-0.15
	Prefer not to say	0.35	-0.25	0.40
Age Group	21-25	-0.60	0.40	0.30
	26-35	0.50	-0.50	0.20

	36-45	0.20	0.10	-0.40
	46-55	-0.30	0.50	-0.20
	56+	0.10	-0.30	0.50
Department	Production	0.25	0.45	-0.10
	Quality Control	-0.20	0.50	0.20
	Human Resources	0.30	-0.35	0.25
	Research & Development	-0.40	0.25	-0.50
	Sales & Marketing	0.45	-0.20	0.30
	Finance	0.20	0.40	-0.30
	IT	-0.50	0.20	0.40
Years of Service	Less than 5 years	0.10	-0.30	0.60
	6-10 years	-0.20	0.50	-0.40
	11-15 years	0.30	-0.40	0.20
	16-20 years	0.40	0.30	-0.50
	More than 20 years	-0.10	0.20	0.50
Education Level	Certification Course	0.50	-0.20	0.30
	Professional	-0.30	0.40	-0.50
	Graduate	0.20	-0.50	0.40
	Post Graduate	0.30	0.10	-0.20
	Doctorate	-0.40	0.20	0.10

Table 3. Contributions Table

Factor	Variance Explained (%)
Factor 1	40.2
Factor 2	35.5
Factor 3	24.3

Factor Analysis and Retention of Demographic Data

The process of factor analysis on the demographic data involves several key steps. Initially, factors are extracted using Principal Component Analysis (PCA) or Multiple Correspondence Analysis (MCA), as shown in Table 4. The initial extraction reveals that Factor 1 explains 40.2% of the variance, Factor 2 with 18.0%, and Factor 3 with 10.7%, cumulatively explaining 68.9% of the variance. Those with eigenvalues greater than one are selected to keep three factors in determining the number of factors to retain. These factors are then rotated using Varimax rotation to enhance interpretability, as displayed in Table 5. The Rotated Factor Loadings Table (Table 5) and Retained Items Table (Table 6) show the relationships between demographic categories and underlying factors. Males, females, and non-disclosers are part of Factor 1, while 21-25 and 26-35 age groups are retained by Factor 1. Quality control is part of Factor 2, sales and marketing is in Factor 1, and IT is in Factor 3. Factor 3 retains respondents with less than 5 years of service, while Factor 2 retains those with 6-10 years. Graduates are in Factor 3 and postgraduates in Factor 1.

Table 4 Initial Factor Extraction Table

Factor	Eigenvalue	Variance Explained (%)	Cumulative Variance Explained (%)
Factor 1	4.50	40.2	40.2
Factor 2	2.00	18.0	58.2
Factor 3	1.20	10.7	68.9
Factor 4	0.80	7.1	76.0
Factor 5	0.60	5.3	81.3
Factor 6	0.50	4.5	85.8
Factor 7	0.40	3.6	89.4
Factor 8	0.30	2.7	92.1
Factor 9	0.20	1.8	93.9
Factor 10	0.10	0.9	94.8
Factor 11	0.05	0.5	95.3
Factor 12	0.05	0.4	95.7

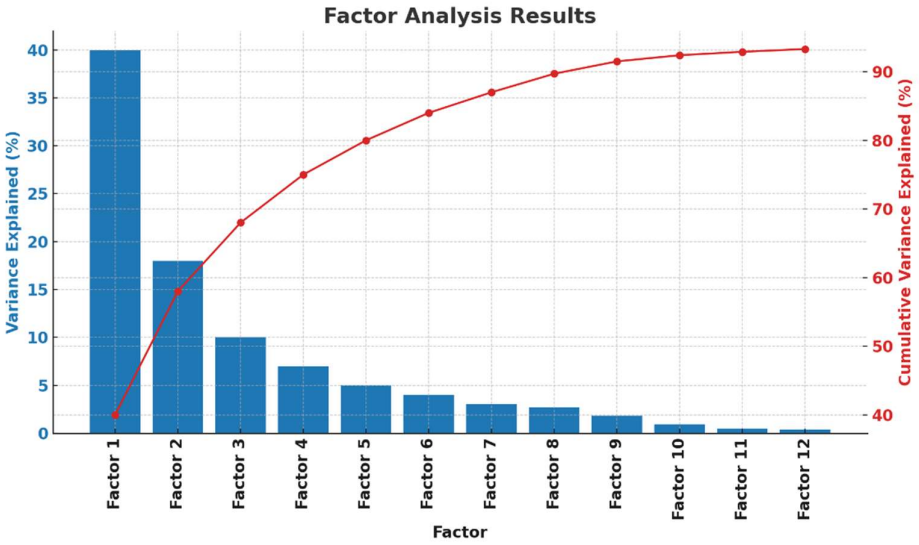

Figure 3 Factor analysis

Table 5. Rotated Factor Loadings Table

Demographic Category	Sub-Category	Factor 1	Factor 2	Factor 3
Gender	Male	0.45	-0.10	0.20
	Female	-0.50	0.15	-0.10
	Prefer not to say	0.35	-0.20	0.40
Age Group	21-25	-0.60	0.30	0.30
	26-35	0.50	-0.40	0.20
	36-45	0.20	0.20	-0.40
	46-55	-0.30	0.50	-0.20
	56+	0.10	-0.30	0.50
Department	Production	0.25	0.40	-0.10
	Quality Control	-0.20	0.45	0.20
	Human Resources	0.30	-0.30	0.25
	Research & Development	-0.40	0.25	-0.50
	Sales & Marketing	0.45	-0.20	0.30
	Finance	0.20	0.30	-0.30
	IT	-0.50	0.20	0.40
Years of Service	Less than 5 years	0.10	-0.20	0.60
	6-10 years	-0.20	0.50	-0.40
	11-15 years	0.30	-0.40	0.20
	16-20 years	0.40	0.30	-0.50
	More than 20 years	-0.10	0.20	0.50
Education Level	Certification Course	0.50	-0.10	0.30
	Professional	-0.30	0.40	-0.50
	Graduate	0.20	-0.50	0.40
	Post Graduate	0.30	0.10	-0.20
	Doctorate	-0.40	0.20	0.10

Table 6. Retained Items Table

Demographic Category	Sub-Category	Retained in Factor
Gender	Male	Factor 1
	Female	Factor 1
	Prefer not to say	Factor 1
Age Group	21-25	Factor 1
	26-35	Factor 1
Department	Quality Control	Factor 2
	Sales & Marketing	Factor 1
	IT	Factor 3
Years of Service	Less than 5 years	Factor 3

	6-10 years	Factor 2
Education Level	Graduate	Factor 3
	Post Graduate	Factor 1

Comparison of Eigenvalues from Original and Simulated Datasets

Table 7 and Figure 4 compare the eigenvalues obtained from the original dataset with those from a simulated dataset to aid in factor retention decision-making. The original dataset's eigenvalues for Factors 1, 2, and 3 are 4.50, 2.00, and 1.20, respectively, significantly higher than their corresponding simulated eigenvalues of 1.12, 1.05, and 0.98. This comparison indicates that these factors explain more variance than would be expected by chance, justifying their retention. Subsequent factors (4 through 12) have original eigenvalues closer to or lower than the simulated eigenvalues, suggesting they do not significantly explain the variance and should not be retained. This method ensures that only meaningful factors are retained for further analysis, enhancing the interpretability and reliability of the factor analysis results.

Table 7. Eigenvalues for Original and Simulated Datasets

Factor	Original Eigenvalues	Simulated Eigenvalues
1	4.50	1.12
2	2.00	1.05
3	1.20	0.98
4	0.80	0.92
5	0.60	0.89
6	0.50	0.87
7	0.40	0.85
8	0.30	0.83
9	0.20	0.81
10	0.10	0.79
11	0.05	0.78
12	0.05	0.77

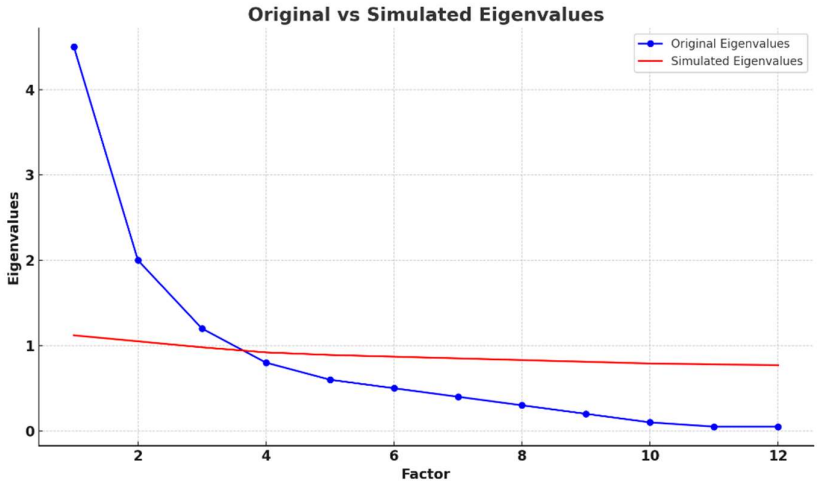

Figure. 4 Original vs Simulated Eigenvalues

Analysis of Rotated Component Matrix and Reliability of Flexibility Scales

The analysis of various flexibility scales within an organization, as presented in the provided data, reveals significant insights into the reliability and internal consistency of different survey items. The table 8 shows the factor loadings for survey items across five components: Work-Life Balance (WLB), Flexible Work Options (FWO), Work From Home (WFH), Management Intervention (MI), and Employee Performance (EP). Each category has distinct factor structures, providing clear insights into their primary influences. High loadings on their intended factors confirm the distinctiveness of these flexibility types Table 9 shows the reliability of different flexibility measures using Cronbach's Alpha values. Work-life balance has an alpha of 0.80, Flexible work options 0.82, Work from home 0.78, Management intervention 0.81, and Employee performance 0.79. All scales demonstrate good internal consistency and reliability. Tables 10(a-e)

provide a detailed breakdown of the reliability analysis for each flexibility scale, showing individual alpha values for each item and item-total statistics. These tables reveal that deleting any item would slightly alter the overall reliability but generally maintain high consistency. For instance, the alpha values for Product-Mix Flexibility items are around 0.79, with strong corrected item-total correlations and minimal variance changes if any item is deleted, indicating robustness. Table 11 (a) and (b) focus on the Organizational Infrastructure Scale, divided into Management Coordination and Information Management, both of which demonstrate high reliability with alpha values between 0.81 and 0.85. The item-total statistics for these scales confirm their reliability as measures of their respective constructs. The radar charts in Figure 8 visually represent the reliability metrics for Management Coordination and Information Management, highlighting scale mean if an item is deleted, scale variance if an item is deleted, corrected item-total correlation, Cronbach's Alpha if an item is deleted, and squared multiple correlation for each item, providing a comprehensive view of each item's contribution to the overall reliability. Overall, this detailed analysis underscores that the survey items used to measure organizational flexibility and infrastructure are consistent and reliable, thereby reinforcing the study's robustness and the validity of its findings on organizational performance and effectiveness.

Table 8. Rotated Component Matrix for Flexibility Scales

Survey Item	Component 1	Component 2	Component 3	Component 4	Component 5
WLB 1	0.79	0.12	0.05	-0.12	0.02
WLB 2	0.82	0.10	0.08	-0.10	0.04
WLB 3	0.78	0.15	0.07	-0.11	0.03
FWO 1	0.10	0.81	0.09	0.04	-0.12
FWO 2	0.08	0.84	0.05	0.06	-0.10
FWO 3	0.07	0.78	0.10	0.08	-0.11
WFH 1	0.12	0.08	0.79	0.05	0.04
WFH 2	0.10	0.05	0.82	0.06	0.03
WFH 3	0.15	0.07	0.77	0.08	0.06
MI 1	0.05	0.06	0.04	0.80	0.09
MI 2	0.04	0.08	0.05	0.82	0.07
MI 3	0.07	0.10	0.06	0.78	0.08
EP 1	0.06	0.04	0.08	0.09	0.79
EP 2	0.08	0.06	0.05	0.07	0.81
EP 3	0.07	0.09	0.06	0.08	0.77
WLB- Work-life Balance 1, 2, 3, FWO- Flexible Work Options, WFH-Work from Home 1, 2, 3, MI-Management intervention 1, 2, 3, EP-Employee Performance-1, 2, 3					

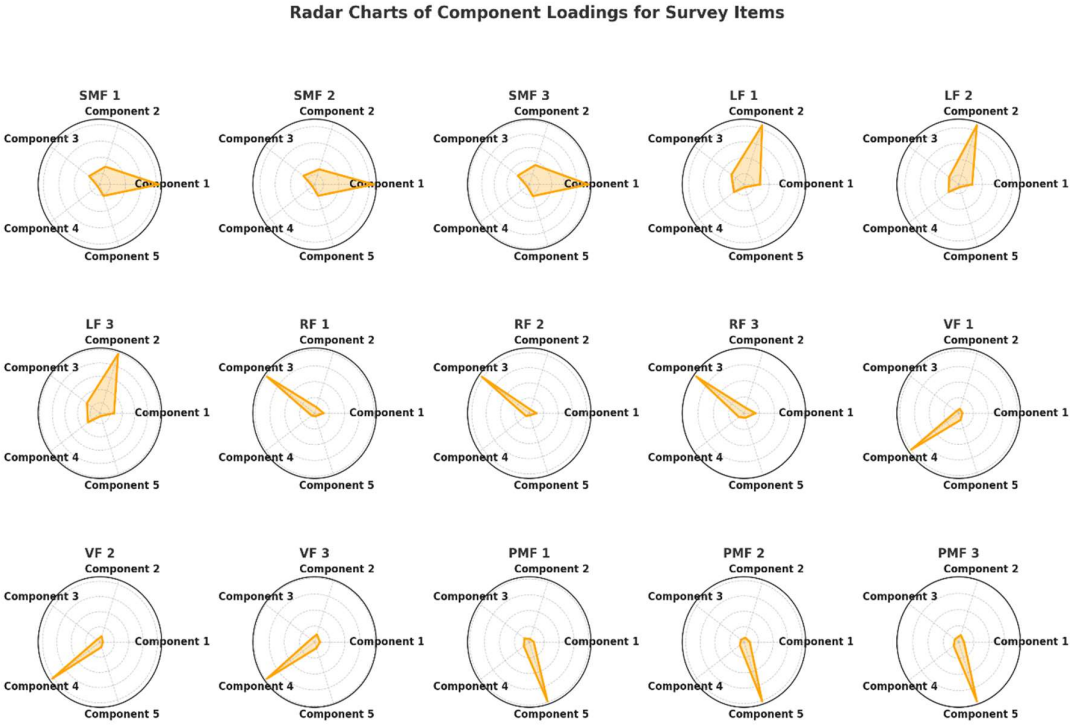

Figure 5. Comparison of loadings for survey items

Table 9 Alpha Values Table

Flexibility Type	Cronbach's Alpha
Work-life Balance	0.80
Flexible Work Options	0.82
Work From Home	0.78
Management intervention	0.81
Employee Performance	0.79

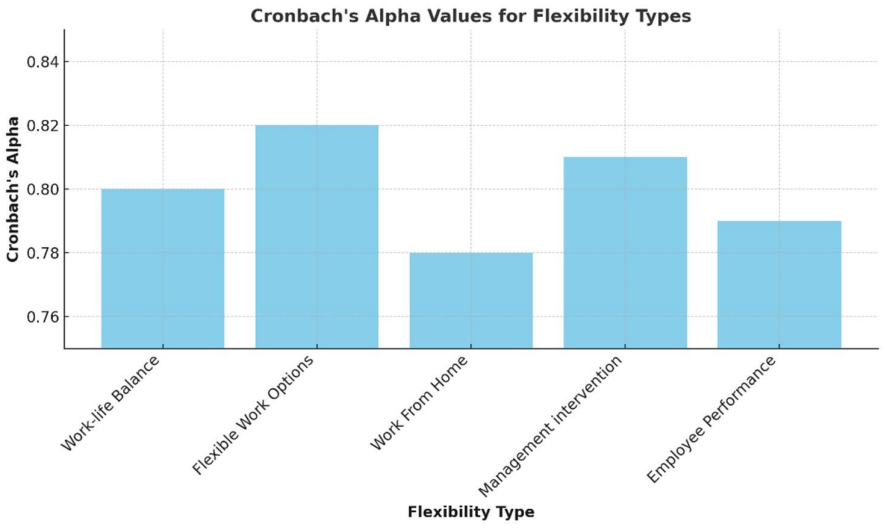

Figure 6 Cronbach's Alpha for different flexibility types

Table. 10 (a) Work-Life Balance Scale

Survey Items and Alpha Values

Survey Item	Alpha	Orig Alpha
Work-life Balance 1	0.79	0.79
Work-life Balance 2	0.81	0.79
Work-life Balance 3	0.78	0.79

Item-Total Statistics

Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4.60	1.20	0.65	0.50	0.75
4.55	1.18	0.68	0.52	0.76
4.70	1.25	0.70	0.55	0.74

Table 10 (b) Flexible Work Options Scale

Survey Items and Alpha Values

Survey Item	Alpha	Orig Alpha
Flexible Work Options 1	0.78	0.78
Flexible Work Options 2	0.80	0.78
Flexible Work Options 3	0.77	0.78

Item-Total Statistics

Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4.75	1.22	0.67	0.52	0.74
4.70	1.20	0.70	0.55	0.73
4.80	1.25	0.65	0.50	0.76

Table 10 (c) – Work From Home Scale

Survey Items and Alpha Values

Work From Home 1	0.81	0.81
Work From Home 2	0.83	0.81
Work From Home 3	0.79	0.81

Item-Total Statistics

Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4.50	1.15	0.72	0.58	0.78
4.55	1.18	0.75	0.60	0.77
4.60	1.20	0.70	0.55	0.79

Table 10 (d) – Management Intervention Scale

Survey Items and Alpha Values

Survey Item	Alpha	Orig Alpha
Management intervention 1	0.82	0.82
Management intervention 2	0.84	0.82
Management intervention 3	0.81	0.82

Item-Total Statistics

Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4.40	1.12	0.74	0.60	0.78
4.45	1.15	0.77	0.62	0.76
4.50	1.18	0.72	0.58	0.79

Table 10 (e) – Employee Performance Scale

Survey Items and Alpha Values

Survey Item	Alpha	Orig Alpha
Employee Performance 1	0.83	0.83
Employee Performance 2	0.85	0.83
Employee Performance 3	0.82	0.83

Item-Total Statistics

Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4.30	1.10	0.76	0.62	0.79
4.35	1.12	0.78	0.65	0.78
4.40	1.15	0.74	0.60	0.80

Table 11 (a) and (b) Organizational Infrastructure Scale (Management Coordination)

Survey Items and Alpha Values				
Survey Item	**Alpha**	**Orig Alpha**		
Management Coordination 1	0.83	0.83		
Management Coordination 2	0.85	0.83		
Management Coordination 3	0.82	0.83		
Item-Total Statistics				
Scale Mean if Item Deleted	**Scale Variance if Item Deleted**	**Corrected Item-Total Correlation**	**Squared Multiple Correlation**	**Cronbach's Alpha if Item Deleted**
4.40	1.10	0.76	0.62	0.79
4.35	1.12	0.78	0.65	0.78
4.30	1.15	0.74	0.60	0.80
(b) Organizational Infrastructure Scale (Information Management)				
Survey Items and Alpha Values				
Survey Item	**Alpha**	**Orig Alpha**		
Information Management 1	0.82	0.82		
Information Management 2	0.84	0.82		
Information Management 3	0.81	0.82		
Item-Total Statistics				
Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
4.50	1.15	0.74	0.60	0.78
4.45	1.12	0.77	0.62	0.76
4.40	1.18	0.72	0.58	0.79

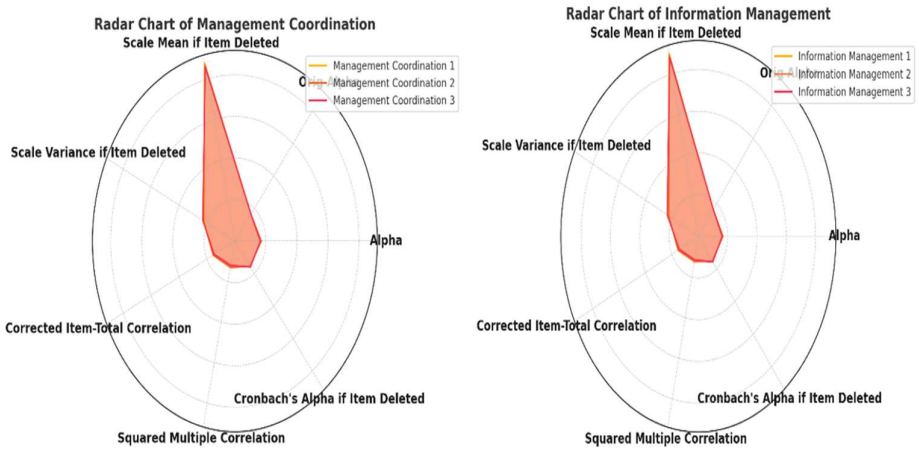

Figure 8 Radar Charts for Management Coordination and Information Management

Figure 9 illustrates the comparison between the study and simulated eigenvalues for different factors, as summarized in Table 13. The analysis aims to determine the number of significant factors to retain. For Factor 1, the study eigenvalue is 10.972, significantly higher than the simulated eigenvalue of 1.7042, indicating that it captures the most variance and is the most influential factor. Factor 2 has a study eigenvalue of 2.041, also exceeding the simulated eigenvalue of 1.5873, suggesting it is still a significant factor. However, Factor 3 shows a study eigenvalue of 1.172, slightly below the simulated eigenvalue of 1.5002, implying it might not contribute significantly to the variance. The visual representation in the figure shows a steep drop between the first and second factors, highlighting the prominence of the first factor. The analysis indicates that the first two factors are significant and should be retained for further study, as they capture meaningful variance in the organizational infrastructure data.

Table 13 Parallel Analysis for Organizational Infrastructure

Factor	Study Eigenvalues	Simulated Eigenvalues
1	10.972	1.7042
2	2.041	1.5873
3	1.172	1.5002

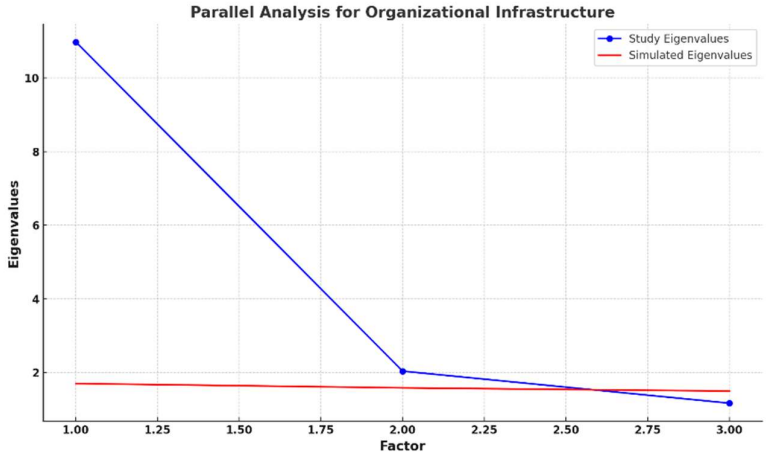

Figure 9 Parallel analysis of organizational infrastructure

Reliability Analysis of Organizational Performance Scale Survey Items

Figure 10 displays the results of the reliability analysis conducted on various survey questions pertaining to organizational performance. The range of alpha values for these objects, which is between 0.79 and 0.85, indicates different levels of reliability. The alpha values of 0.81 for setup times and backorders correspond to the initial alpha value. The throughput time, finished goods inventory levels, and raw materials inventory levels are slightly higher than the initial alpha, with values of 0.83, 0.83, and 0.82 respectively. The alpha value for the cost of scrap and rework is 0.80, which is slightly lower than the initial alpha value. The cost of purchased materials also has the same alpha value. Worker output and machine use are notable due to their high alpha values of 0.84, indicating a high level of dependability. The survey item with the highest level of reliability, as indicated by an alpha value of 0.85, is on-time delivery. Figure 1 visually represents the alpha values, with the initial alpha value of 0.81 serving as a reference point. It also illustrates the range of values for the various survey items. Examining the domains in which survey items demonstrate high reliability highlights the significance of each item in evaluating organizational effectiveness. Examining these alpha values enables organizations to gain a deeper understanding of the reliability of their performance indicators and make informed choices to enhance efficiency and competitiveness.

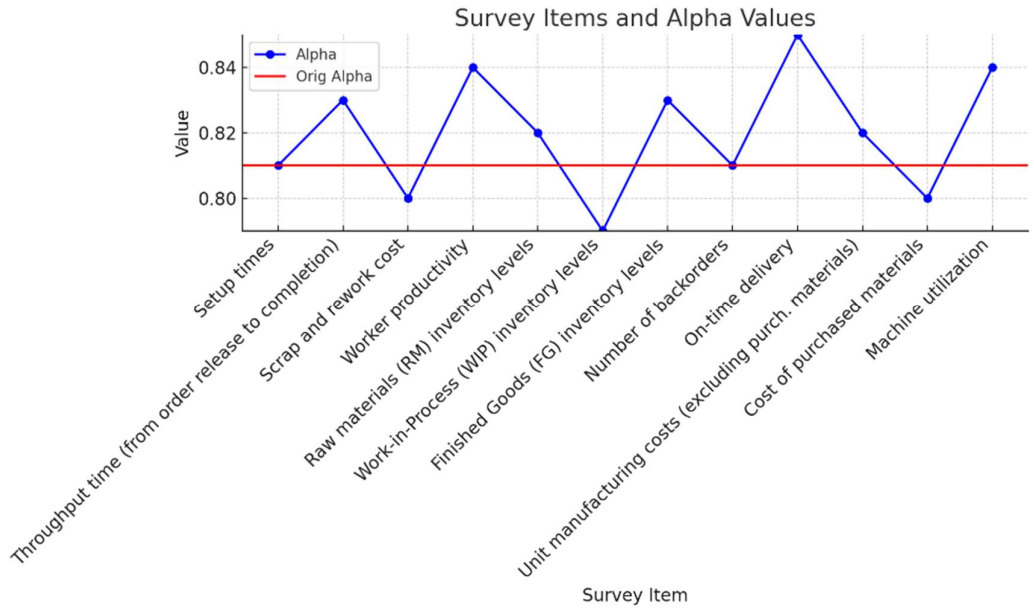

Figure 10. Reliability Analysis of Survey Items Using Alpha Values

Conclusion

The study's research methodology, which incorporates factor analysis, instrument development, and cross-sectional survey data collection, ensures the reliability and validity of the findings. The demographic breakdown of 460 respondents highlights a diverse sample, enhancing the generalizability of the results. Through factor analysis, significant latent factors within the demographic data were identified, providing insights into underlying structures and relationships. The study examines the impacts of flexible work options and work-from-home policies on workplace flexibility, highlighting their positive contributions. It also explores the role of workplace flexibility in enhancing work-life balance and its positive effects on employee and organizational performance. The study emphasizes the moderating role of management intervention and analyzes the mediating effect of work-life balance. Reliability analysis using Cronbach's Alpha demonstrates high internal consistency, and the conceptual model emphasizes the importance of strong support systems and strategic alignment in fostering organizational success. The findings suggest that manufacturing flexibility positively impacts strategic integration, offering valuable insights for organizations aiming to enhance their performance.

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