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The impact of technological innovation on employee performance in Indian IT industry : An empirical study in NCR

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Abstract

The influence of technological innovation on employee performance, especially in India's National Capital Region (NCR), has not been extensively studied. The objective of this study was to investigate the correlation between technical innovation, organizational support, and employee performance in the IT business in the National Capital Region (NCR). A quantitative research methodology is employed to gather survey data from 212 IT personnel in NCR, which is further analyzed using Structural Equation Modeling (SEM) analysis. The study investigated the role of organizational support as a mediator in the relationship between technological innovation and employee performance. The results suggest that technological innovation has a positive and significant impact on employee performance ($\beta = 0.481$, $P = 0.001$). Furthermore, the research reveals that organizational support influences the connection between technological innovation and employee performance ($\beta = 0.247$, $P = 0.001$), emphasizing the significance of a supportive work environment in amplifying the beneficial effects of technological innovation on employee performance.

This study contributes to the existing body of literature by offering empirical data on the correlation between technological innovation and employee performance in the IT industry in the National Capital Region (NCR). The study's results have practical ramifications for firms in NCR and comparable urban areas, underscoring the significance of allocating resources towards technology advancement and fostering a conducive work atmosphere to enhance employee productivity. The study also emphasizes the necessity for more investigation in this domain to have a more comprehensive understanding of the influence of technology advancement on employee productivity in various settings and sectors.

Subject Classification: 97P20.

Keywords: *Employee performance, Organizational support, Technological innovations, National Capital Region.*

1. Introduction

Indian IT services, software development, and business process outsourcing are among the fastest-growing businesses worldwide. To be competitive, the sector must address difficulties such as fast technology development, a skilled workforce scarcity, and the requirement for strong organizational support systems. This research examines technical innovation, personnel performance, and organizational support in the Indian IT industry to solve these issues. In recent years, technological improvements and market competitiveness have led to considerable changes in the IT business. Organizations must innovate, focus on employee performance, and provide necessary support to stay competitive.

Technological innovation is crucial in every company, especially IT, as it helps keep ahead of the competition. To stay competitive and fulfill worldwide demand for software development and IT services, Indian IT

businesses have invested heavily in technical innovation. Technology allows companies to deliver cutting-edge services, boost efficiency, and improve performance. Thus, firms must assess how technology innovation impacts employee performance and how to support them.

Employee performance is vital for every firm, especially in IT, where skills are everything. Employee performance is influenced by motivation, work satisfaction, career growth, and organizational support. Therefore, firms must prioritize employee performance to maintain market competitiveness. Understanding the factors that impact employee performance in the IT business can aid in developing strategies to enhance performance and retain qualified workers.

Organizational support is a vital component of any organization and is essential to achieving high levels of employee performance. In the context of the IT industry, organizational support is when organizations provide resources, training, and a supportive work environment to their employees. Research had shown that organizational support have an impact on the performance of an employee in IT industry. Therefore, it is crucial to understand the extent to which organizational support facilitates the association between technological innovation and performance in the Tier-I cities of India.

Although there is a significant body of literature on the individual components of technological innovation, employee performance, and organizational support, few studies have explored their interrelationships in the Indian IT industry. The limited Indian research on technological innovation and employee performance have yielded conflicting results (Ayyagari et. al., 2011; Nambiappan & Sohrab, 2015). Organizational support is important for employee success in the IT business (Gamage & Harvie, 2019), but few research have examined how it facilitates the relationship between technological innovation and performance in India. This study examines technology innovation, performance, and organizational support in Tier-I Indian cities to address this gap.

2. Literature Review

In recent years, the Indian IT industry has grown tremendously, boosting the economy (Joshi & Joshi, 2018).

Organizations must stay competitive, innovate, and retain competent personnel as the sector evolves (Kurian & Jacob, 2019). Organizations must provide a supportive work environment, give growth and development opportunities, and encourage and engage people to achieve goals (Koshy,

Gupta, & Singh, 2018). Organizational support is crucial for improving employee performance and fostering innovation in the Indian IT sector.

2.1 Organizational Support and Employee Performance

Organizational behavior involves assessing organizational support, which investigates the extent to which employees perceive their employer values their efforts and places importance on their welfare (Eisenberger et al., 1986). Evidence suggests that organizational support has a crucial role in influencing employee outcomes, including work satisfaction, organizational commitment, and employee performance (Eisenberger et al., 2002). In the IT industry, where employees are required to have technical expertise and continuously learn and adapt to new technologies, organizational support becomes crucial to ensuring employee performance.

Research indicates a significant correlation between organizational support and employee performance in IT. A research by Lin, Lu, and Wu (2014) indicated that organizational support improved employee work performance, particularly for those with high expectations and limited control. Wang and Noe (2010) found that IT staff perform better when they perceive organizational support. Additionally, persons with a higher task reliance showed a stronger association between organizational support and staff productivity.

However, it is important to recognize that organizational support does not always correspond to employee achievement.

Excessive organizational support might negatively impact employee performance. According to Lee, Hwang, and Choi (2015), excessive organizational assistance negatively impacts employee performance in the IT business. The authors indicate that excessive corporate assistance might reduce employee autonomy, hindering creativity and innovation.

2.2 Organizational Support and Technological Innovation

The IT industry has experienced rapid technological advancements, resulting in organizations facing intense competition to remain relevant and competitive. One way to ensure sustained success is through innovation, which has become a critical factor in driving growth and competitiveness. Studies have found that innovation is positively related to organization support, where employees are provided with the necessary resources, training, and opportunities to develop and implement innovative ideas (Khan & Manopichetwattana, 2017). In contrast, a lack of support may hinder employees' creativity and innovation, resulting in

reduced performance (Bettiol et. al., 2019). Therefore, it is crucial for IT organizations to support their employees to foster innovation and ensure sustained success in the IT industry.

Organizational support in the IT industry is crucial in driving technological innovation, as it provides workers with necessary resources, training, and opportunities to develop and implement innovative ideas. Studies have shown that when employees are provided with a supportive environment, workers engage in innovative behaviours that contribute to technological advancements (Jiang & Gu, 2016). Moreover, organizations that invest in providing technological resources to their employees also tend to have higher levels of innovation (Rana & Malik, 2017). Therefore, a supportive organizational culture play a vital role in driving technological innovation in the IT industry.

According to Bettiol et al. (2019), employees' views of organizational support greatly impact their incentive to engage in creative activity. The study found that a supportive corporate culture increased workers' perception of innovation value, leading to increased engagement and performance. Creating a friendly culture that encourages creativity and helps employees pursue technical breakthroughs is crucial.

2.3 Technological Innovation and Employee Performance

The IT industry is highly dynamic and constantly evolving due to the rapid advancements in technology. In order to stay competitive, organizations must focus on technological innovation to improve their products and services. Research has shown that technological innovation positively impacts employee performance in the IT industry (Sekhar & George, 2021). A study by Huang and Ho (2020) found that technology-enhanced work environments can increase employee productivity and satisfaction. This highlights the importance of technological innovation in promoting employee performance in the IT industry.

Additionally, new technology in the workplace improves staff capabilities and job effectiveness (Hassan & Sarker, 2020). In the IT business, technical innovation is crucial for success.

Technological innovation provides employees with the newest tools and resources for more efficient and effective job performance. Research by Chang, Chen, and Lan (2020) indicates that employees exposed to new technology are more inventive and productive.

However, the relationship between concepts is not always clear. Research indicates that organizations must provide adequate training and

support to personnel to adapt to new technologies (Deli & Ünvan, 2021). Without sufficient training and assistance, employees may struggle with new technology, thereby affecting their performance. Firms must provide ongoing support and training to employees to help them adapt to new technologies and improve performance.

Based on the above discussion, the following are the hypothesis

2.4 Objectives of the Study: The current study has the following objectives.

1. To examine the relation between technology innovation and employee performance.
2. To investigate the influence of organizational support as a moderator on the relationship between technological innovation and employee performance.

2.5 Hypothesis

Based on the above discussion, it is clear that these study variables are interlinked to each other. Hence, a conceptual framework is being designed to test hypothesis.

H1: Technological innovation and Organizational support significantly predicts Employee Performance.

H1 a: Technological innovation is positively related to employee performance.

H1 b: Organizational support is positively related to employee performance.

H2: Technological innovation is positively related organizational support

H3: Organization support moderate the impact of Technological innovation and employee performance.

3. Research Methodology

The research approach employed in this study was the utilization of a Likert scale questionnaire, including a spectrum from 1 to 5, to gather data pertaining to technical innovation, employee performance, and organizational support within the IT business. Data was collected from five organizations based in the National Capital Region (NCR) of India using a non-probability sampling approach called convenient sampling. The National Capital Region (NCR) is renowned for its substantial

concentration of information technology (IT) firms, making it a prominent IT center in India.

A total of 240 questionnaires were distributed to employees at these firms to get their thoughts on the three research variables. Out of 240 surveys distributed, 212 valid responses were gathered, resulting in an 88.3% response rate. The research participants were selected based on their willingness to participate and availability during data collection.

The data from the Likert scale questionnaire was analyzed using descriptive statistics, including means, standard deviations, frequencies, and percentages. The data underwent inferential statistical analysis, including correlation and regression analyses, to examine the relationships between research variables. The statistical analyses were done using SPSS 26.0.

The research technique employed in this study was to acquire a representative sample of individuals employed in the IT sector in the NCR region of India, and to gather accurate and trustworthy data to analyze the correlation between the variables under investigation.

4. Data Analysis

4.1 Demographic Analysis

After conducting a profile analysis of the participants, the study revealed that 66% of the respondents were male and 34% were female. Additionally, the study found that 132 out of 212 participants held middle-level positions while the remaining participants were in senior positions. All the participants had experience of at least five years in the IT industry and were primarily involved in designing, testing, and implementing software. Moreover, all the participants held technical qualifications, such as a Diploma/B. Tech. These findings provide crucial insights into the characteristics of IT employees.

4.2 Exploratory & Confirmatory Factor analysis.

The measuring scales were verified using exploratory factor analysis (EFA) employing principal component analysis (PCA). A linear combination of variables that extracted maximum variance and generated an uncorrelated factor was the PCA aim. Using a varimax orthogonal rotation prevented overreliance on one component. The Kaiser-Meyer-Olkin Measure (0.924) and Bartlett's test of sphericity (5421.419) indicate that the sample is sufficient for factor analysis. All variables had factor

loadings larger than 0.5, and factor analysis generated 3 factors that explained 72.14% of the variation.

Table 1
Confirmatory factors

Items	Description of items	Loading	Source	Factor
OS1	Organization provide you with the necessary resources to perform your job effectively	0.812	Eisenberger et. al., (1990); Rhoades & Eisenberger (2002); Shore, & Wayne (1993); Spreitzer (1995)	Organizational Support
OS2	Organization recognize and reward your contributions to the company's success	0.782		
OS3	Managers provide you with feedback on your performance and help you improve your skills?	0.721		
OS4	Organization value your input and suggestions for improvement	0.711		
TI1	To what extent has your organization adopted new technologies in the past year	0.723	Tornatzky & Fleischer (1990); Rada & Ragowsky (2011); Chen & Cheng (2013);	Technological Innovation
TI2	How effective has the implementation of new technologies been in improving organizational performance?	0.811		
TI3	To what extent have new technologies been able to reduce costs and increase efficiency in your organization?	0.821		
TI4	How satisfied are you with the level of technological resources and support provided by your organization?	0.845		
EP1	During the past six months, I have been performing well and meeting the job requirements	0.792	Wiese & Buckley (1998); London & Smither (1995); Ng & Feldman (2012); Ployhart & Moliterno, (2011)	Employee Performance
EP2	I receive feedback on my performance from my immediate supervisor	0.891		
EP3	I frequently take initiatives to improve my performance and contribute to the success of my organization	0.831		
EP4	I am satisfied with the opportunities provided by the organization for career development	0.722		

Source: Authors Compilation

To confirm the measurement model and the fit indices, a confirmatory factor analysis (CFA) was performed. The model considered Technological Innovation (TI), Organizational Support (OS), and Employee Performance (EP) as multi-item constructs. The results of the CFA confirmed the factorial structure of the instrument, with a CMIN/df = 2.261, CFI= 0.947, RMSEA= 0.061, TLI = 0.943, NFI = 0.927, and IFI = 0.945. Overall, these results indicate that the measuring scales used in the study were reliable and valid.

AMOS and Statistical Package were used to examine convergent and discriminant validity of the measurement model (Gaskin 2012). Average variance extracted (AVE) and Composite Reliability (CR) scores assessed convergence. Hair et al. (2010) reported CR values over 0.7, suggesting strong internal consistency dependability. Comparing the square root of AVE values with correlation values and evaluating if each construct's MSV scores were less than AVE scores assessed discriminant validity. Table 1 shows that square root AVE values exceeded correlation values, demonstrating discriminant validity. All constructs had dependability ratings over 0.70 as shown in Table 1, which is good. The results also demonstrated predicted correlations between all constructs.

4.2 Hypotheses Testing Result

SEM was used to assess the model and establish relation. The goodness of fit indices for the proposed model were found to be acceptable, with a CFI indicator value above 0.9 and an RMSEA indicator value below 0.08, CMIN/df= 2.261, CFI=0.947, RMSEA=0.061, TLI= 0.943, NFI=0.927, IFI=0.945, indicating a good fit. The regression weights were computed using SEM in AMOS, and all values were found to be significant ($p < 0.05$). The results supported the hypotheses H1a, H1b, and H2, as shown in Table 2 and Figure 1.

Table 2
Results for Hypothesis Testing

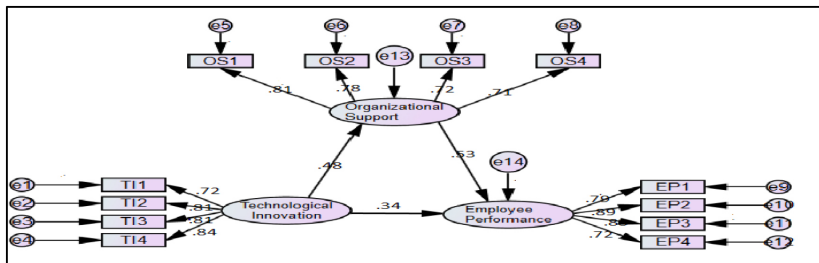
Hypotheses	Path Analysis	S.R.W	Standard Error	t-value	p-value	Results
H1a	TI ----> EP	0.481	0.123	6.7	***	Supported
H1b	OS----> EP	0.53	0.093	7.45	***	Supported
H2	TI----->OS	0.34	0.087	5.61	***	Supported

Note: S.R.W.: Standardized Regression Weights, ***significant values

Table 3
Moderation Results

Hyp	Path	Path Coefficient	p-value	Results
H3	TI *OS	0.247	***	Supported

Source: Authors Analysis



Source: Authors Analysis

Figure 1

SEM on the relationship between TI, OS & EP(Hypothesis Testing)

4.3 Moderating Effect

The study explored how organizational support moderates the link between technical innovation and IT worker performance.

Table 3 reveals a significant interaction effect with a route estimate of 0.247 and a p-value of <0.001 in moderation analysis. This supports hypothesis H3 that organizational support moderates innovations and performance.

The study found that technical innovation and organizational support positively impact employee performance, with a stronger correlation when support is high. The study highlights the need of organizational support in IT technology adoption and use, and the potential advantages of helping individuals to maximize the performance impact of technological advancements.

5. Conclusion

This study explored how technological innovation affects IT staff support and performance. The study found that technological innovation positively affects organizational support ($\beta = 0.481$, $p < 0.001$) and staff performance ($\beta = 0.34$, $p < 0.001$). The study indicated that organizational

support positively affects employee performance ($\beta = 0.53$, $p < 0.001$). Research indicates that organizational support moderates the relationship between technological innovation and employee performance ($\beta = 0.247$, $p < 0.05$), indicating that an inspiring workplace might enhance the positive impact of tech innovation on employee performance.

This study's findings affect management. IT companies should invest in technology innovation to improve organizational support and worker performance. Second, businesses should build a friendly workplace that encourages employee growth and engagement to boost performance. Third, firms should adopt policies and procedures that encourage technology innovation to boost employee performance and creativity.

This study has various drawbacks despite its significance. The study employed convenience sampling, which may not reflect the population. Since the study was done in NCR, India, the conclusions may not apply to other nations. Future study should use probability sampling and a bigger, more varied sample to improve generalizability.

This study concludes that technical innovation boosts IT workers' performance and organizational support, and that support from within the company acts as a moderator in the connection between the two. Researchers concluded that investing in technology innovation and creating a positive work environment were the most effective ways to boost employee performance, which has significant consequences for managers and businesses.

References

- [1] Ayyagari, M., Grover, V., & Purvis, R., Technological innovations and firm performance in emerging economies: The case of Indian IT firms. *MIS Quarterly*, 35(2), 435-462 (2011).
- [2] Bettiol, M., Di Maria, E., Finotto, V., & Grandinetti, R., The impact of organizational support on innovation: The mediating role of employees' perceived value of innovation. *Journal of Knowledge Management*, 23(4), 679-698 (2019).
- [3] Bhardwaj, A., Kumar, V., Sharma, A., & Narula, A., Analyzing the mediating effect of consumer online purchase intention in online shopping of domestic appliances. *Journal of Information and Optimization Sciences*, 43(7), 1499-1515 (2022). <https://doi.org/10.1080/02522667.2022.2128510>.

- [4] Bhatia, A., Roy, B. & Kumar, A., A review of tourism sustainability in the era of Covid-19. *Journal of Statistics and Management Systems*. [Taylor & Francis Online], [Web of Science ®], [Google Scholar] (2022).
- [5] Chang, C. M., Chen, C. C., & Lan, Y. J., The effects of organizational innovation culture and technological innovation on employee creativity: A multilevel analysis. *Journal of Business Research*, 117, 451-458 (2020).
- [6] Chen, C. C., & Chang, Y. Y., Enhancing employee satisfaction through effective communication: A case of Taiwanese travel agencies. *Journal of Travel & Tourism Marketing*, 30(3), 235-249 (2013).
- [7] Chen, S. S., & Cheng, Y. C., The impacts of IT on organizational cost and efficiency. *Journal of Global Information Technology Management*, 16(1), 42-65 (2013).
- [8] Deli, Y., & Ünvan, G. M., The effect of technology readiness on the relationship between innovation and work outcomes. *Technology Analysis & Strategic Management*, 33(1), 31-47 (2021).
- [9] Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D., Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500-507 (1986).
- [10] Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, I., & Rhoades, L., Perceived supervisor support: Contributions to perceived organizational support and employee retention. *Journal of Applied Psychology*, 87(3), 565-573 (2002).
- [11] Gamage, P., & Harvie, C., Organizational support and job satisfaction in the Sri Lankan IT sector. *Employee Relations*, 41(3), 526-540 (2019).
- [12] Hassan, M. M., & Sarker, M. N. I., Role of technological innovation in employee performance: Moderating effect of human resource management practices. *Asia-Pacific Journal of Business Administration*, 12(3), 305-327 (2020).
- [13] Huang, S. H., & Ho, C. I., Investigating the effects of technology-enhanced work environments on job satisfaction and productivity. *International Journal of Human-Computer Interaction*, 36(4), 335-343 (2020).
- [14] Jiang, C., & Gu, Q., Organizational support, teamwork, and innovation: A study of SMEs in China. *Asia Pacific Journal of Management*, 33(1), 225-246 (2016).
- [15] Joshi, A., & Joshi, U., A review of India's IT industry. *Journal of Management and Research*, 8(1), 1-7 (2018). doi: 10.5958/2394-2770.2018.00001.1.

- [16] Khan, M. A., & Manopichetwattana, V., Employee creativity and innovation in organizations: Review, integration, and future directions for hospitality research. *International Journal of Hospitality Management*, 62, 1-13 (2017).
- [17] Koshy, A., Gupta, S., & Singh, J. P., Employee engagement in Indian IT sector. *Global Business Review*, 19(2), 388-402 (2018). doi: 10.1177/0972150917752923.
- [18] Kurian, S., & Jacob, A., Strategic human resource management practices and organizational performance in the Indian IT sector. *Journal of Asia Business Studies*, 13(2), 257-273 (2019). doi: 10.1108/JABS-01-2018-0014.
- [19] Lee, H. J., Hwang, H., & Choi, J. N., Organizational support and innovative work behavior in the Korean IT industry. *Journal of Leadership & Organizational Studies*, 22(2), 158-167 (2015).
- [20] London, M., & Smither, J. W., Feedback orientation, feedback culture, and the longitudinal performance management process. *Human Resource Management Review*, 5(3), 341-384 (1995).
- [21] Nambiappan, G., & Sohrab, S. S., The impact of technological innovation on the firm's performance: A study on Indian IT companies. *Journal of Management Research*, 15(3), 171-182 (2015).
- [22] Ng, T. W., & Feldman, D. C., Employee voice behavior: A meta-analytic test of the conservation of resources framework. *Journal of Organizational Behavior*, 33(2), 216-234 (2012).
- [23] Ployhart, R. E., & Moliterno, T. P., Emergence of the human capital resource: A multilevel model. *Academy of Management Review*, 36(1), 127-150 (2011).
- [24] Rada, R., & Ragowsky, A., Technology innovation and its impact on organizational performance: An integrative conceptual framework. *Journal of Engineering and Technology Management*, 28(1-2), 38-54 (2011).
- [25] Rada, R., & Ragowsky, A., Technology innovation and its impact on organizational performance: An integrative conceptual framework. *Journal of Engineering and Technology Management*, 28(1-2), 38-54 (2011).
- [26] Rana, N. P., & Malik, S., Investigating the influence of organizational culture on the success of IT projects. *Journal of Enterprise Information Management*, 30(1), 146-163 (2017).
- [27] Rhoades, L., & Eisenberger, R., Perceived organizational support: a review of the literature. *Journal of Applied Psychology*, 87(4), 698-714 (2002).

- [28] Sao, A., Saxena, R., Ganguly, C., Bapat, G.S., & Sharma, P., Effect of Leadership Style on Employee Performance in Health Care Industry in India. *Asia Pacific Journal of Health Management* (2022).
- [29] Sao, A., Kumar, A., Bapat, G., Khan, M. S., & Singh, S., Analysing Customer Loyalty, Customer Satisfaction and Service Quality at DLF Mall of India Marketing and Management of Innovations, 1, 146-157 (2023). <https://doi.org/10.21272/mmi.2023.1-13>.
- [30] Sekhar, V. V., & George, B., Technological innovation and employee performance: A study of the Indian IT industry. *International Journal of Emerging Markets*, 16(2), 266-283 (2021).
- [31] Shore, L. M., & Wayne, S. J., Commitment and employee behavior: Comparison of affective commitment and continuance commitment with perceived organizational support. *Journal of Applied Psychology*, 78(5), 774-780 (1993).
- [32] Sharma, P. ., Shaikh, A. A., Sao, A., & Rohilla, N., Using Technology Acceptance Model, Analyzing the Role of Telehealth Services in the Healthcare Industry During COVID-19: ---7th International Conference on Embracing Change & Transformation Innovation and Creativity. *Asia Pacific Journal of Health Management*, 17(2) (2022). <https://doi.org/10.24083/apjhm.v17i2.1815>.
- [33] Shirina, S., Sharma, R., Agarwal, R. N., & Sao, A., Factors affecting employee engagement in higher education institution-An empirical study in NCR. *Journal of Information and Optimization Sciences*, 43(7), 1779-1800 (2022). <https://doi.org/10.1080/02522667.2022.2128533>.
- [34] Spreitzer, G. M., Psychological empowerment in the workplace: Dimensions, measurement, and validation. *Academy of Management Journal*, 38(5), 1442-1465 (1995).
- [35] Tornatzky, L. G., & Fleischer, M., The processes of technological innovation. Lexington Books (1990).
- [36] Tornatzky, L. G., & Fleischer, M., The processes of technological innovation. Lexington Books (1990).
- [37] Wiese & Buckley (1998); London & Smither (1995); Ng & Feldman (2012); Ployhart & Moliterno, (2011)
- [38] Wiese, B. S., & Buckley, M. R., The performance appraisal process in a multinational high-technology firm: A case study. *International Journal of Human Resource Management*, 9(5), 847-862 (1998).