

Sustainable Business Practices and Leadership as Catalyst for Employee Innovation in IT Industry

¹Dr. Nagalakshmi M.V.N., ²Y. V. N. Sai Sri Charan, ³Vishnu N.S., ⁴Dr. Ramprakash O. Panchaariya, ⁵Satuluri Padma, ⁶Dr. Shakti Awasthi

¹Assistant Professor, Faculty of Management, S.R.M. Institute of Science and Technology, Kattankulathur, Tamilnadu, India. lakshmiimaddali@gmail.com

²DMTS - Distinguished Member of Technical Staff, Department of Technology, Verizon Data Services Limited, Hyderabad, Telangana, India. saisricharan@gmail.com

³Assistant Professor, Department of Commerce and Professional Studies, Rajagiri College of Social Sciences (Autonomous), Rajagiri Kalamasseri, Cochin, Kerala, India. vishnuns@rajagiri.edu. <https://orcid.org/0000-0001-5243-6541>

⁴Associate Professor, Department of Management Studies, B. D. College of Engineering Sevagram, Wardha, Maharashtra, India. ram_bdce@rediffmail.com

⁵Professor, K L Business School, Koneru Lakshmaiah Education Foundation (Deemed to be University), Vaddeswaram, Andhra Pradesh, India. padmasmba@gmail.com

⁶Associate Professor, Department of HR, Lala Lajpatrai Institute of Management, Mumbai, Maharashtra, India. shakti.awasthi@yahoo.com

ARTICLE INFO

ABSTRACT

Received: 20 Dec 2024

Revised: 01 Feb 2025

Accepted: 19 Feb 2025

In the fast-changing IT sector of today, innovation is essential to deliver competitive edge. Organizations are embracing green business practices to promote long-term growth while embracing leadership strategies that encourage creativity and flexibility in employees. Sustainable leadership, focusing on environmental, social, and ethical responsibility, is at the centre of developing workplace culture and motivating employee innovation. This research analyzes the effect of leadership and sustainable business practices on employee innovation among IT professionals. Based on Structural Equation Modeling of data gathered from 265 IT professionals, the research explains the mediating role of leadership in generating innovation. Transformational leadership and sustainable business practices have a significant effect on employee innovation, according to the findings. Sustainability further increases the effect of leadership, affirming its indirect effect in increasing innovation. Model fit indices verify excellent theoretical fit. Demographic testing reveals that gender factor has no influence on these relationships, but employees who have been working for more than 10 years are sensitive to sustainable leadership. The study highlights the necessity of incorporating sustainability into leadership strategies in order to promote innovation, and the findings are beneficial to IT companies. Long-term consequences on organizational performance must be analyzed by future research studies.

Keywords: Sustainable Business Practices, Transformational Leadership, Employee Innovation, Structural Equation Modeling, IT Industry

1. INTRODUCTION

Sustainable business culture and leadership are presently seen as drivers of innovation. This study analyses how the same drivers influence worker innovation within IT companies utilizing SEM to analyze causality. Innovation is now an anchor to success in today's IT landscape where companies are under constant pressure to reinvent themselves in an attempt to survive the game [1]. Sustainable business practice has also made a huge leap with companies realizing that profitability must be harmonized with social and environmental responsibility. Leadership, especially transformational leadership, is also crucial in building an innovative workforce that can adjust with the new dynamics of the business [2]. The intersection of these two dimensions sustainability and leadership is a strategic model for developing employee innovation. Business sustainability goes beyond the environmental industry but also involves social and economic. Companies that sustain their businesses prioritize ethical management, corporate social responsibility, and resource effectiveness, which translate to long-term success [3]. In information technology,

sustainability is creating power-saving technology, carbon footprint reduction, and ethical labor policies. Increasing evidence points towards employees' motivation and commitment being increased by sustainability. Workers in companies embracing sustainability tend to feel a sense of meaning and responsibility, which increases their creativity and level of innovativeness [4]. Some of the firms that have brought sustainable practices into the mainstream of their operations are many big IT companies, which have established innovative working cultures. Leadership is one of the principal drivers of innovation in organizations [5]. Transformational leaders, specifically, encourage and stimulate employees to innovate, test, and present novel solutions. Transactional leaders care more about short-term effectiveness and performance, but transformational leaders care about vision, empowerment, and long-term development [6]. Evidence shows that companies with excellent leadership development initiatives have higher employee innovation. By placing sustainability at the forefront of their agenda, leaders compel employees to associate their creative activities with moral and socially desirable business objectives [7]. This association, therefore, not only increases innovation but further increases the organization's reputation and brand equity [8]. The interrelationship between sustainability, leadership, and employee innovation is intricate but highly interconnected. Sustainable business practices form a system of ethical decision-making and long-term development, and leadership is the authority that directs these practices into productive strategies [9]. Employees, in accordance with this strategic vision, implement innovative behaviors towards organizational performance. A core element of this engagement is the role of leadership in facilitating the influence of sustainability on innovation [10]. Proactive leaders who promote sustainable practice create a culture where employees can experiment with new ideas without apprehension about making mistakes [11]. Such psychological safety encourages a culture of experimentation and improvement.

2. LITERATURE REVIEW

The IT sector of today is innovation-driven, with companies constantly evolving to stay competitive. Business ethics and leadership in the dynamic environment ensure long-term competitiveness and growth. Sustainability in environmental, social, and ethical aspects assists companies in creating responsible strategies that meet international expectations [12]. Transformational leadership and leadership in general are central drivers of employee innovation in the form of creating a culture of creativity, empowerment, and ongoing learning. The intersection of sustainability and leadership gives an advantage to organizations through motivating employees to create new ideas in pursuit of ethical and sustainable goals [13].

2.1. The Role of Sustainability and Leadership in the IT Industry

Innovation is the ticket to success in the IT industry today, where companies are forced to work day and night just to remain competitive. Sustainable business has gained steam in recent years as corporations understand that profitability needs to be balanced with social and environmental responsibility [14]. Leadership, and in this case transformational leadership, plays a crucial role in the development of an innovative human capital that can adapt to the fast-paced nature of the industry. The convergence of these two concepts sustainability and leadership offers a strategic direction for supporting employee innovation [15].

2.2. Importance of Sustainable Business Practices

Sustainability in business goes beyond the environment to encompass social and economic. Companies that aim for a sustainable approach emphasize ethical leadership, CSR, and resource effectiveness, all of which are factors in long-term success. In the information technology sector, sustainability means the creation of energy-efficient technology, carbon footprint reduction, and fair labor practices [16]. New studies indicate that sustainability improves employee motivation and engagement. The workers in sustainable organizations will be more engaged and responsible and hence more innovative and creative, organizations that have integrated sustainable activities into their daily operations, generating an innovation-culture work environment [17].

2.3. Leadership as a Catalyst for Innovation

Leadership is a critical facilitator of organizational innovation. Transformational leaders, in turn, motivate and encourage employees to be creative problem solvers, risk-takers, and idea generators of new ideas. Transformational leaders are different from transactional leaders who are motivated by short-term efficiency and productivity [18]. Transformational leaders prioritize vision, empowerment, and long-term growth. Studies reveal that employee innovation occurs more often in organizations that possess robust leadership development programs [22]. When leaders embrace sustainability, they encourage their employees to direct their innovative efforts towards goals that

are both values-based and socially responsible [24]. This harmonious alignment maximizes innovation, as well as the firm's reputation and brand value.

2.4. The Interplay Between Sustainability, Leadership, and Innovation

The interplay between sustainability, leadership, and employee innovation is intricate but greatly dependent on each other. Sustainable business practices serve as a template for ethical decision-making and long-term development, and leadership is a force that turns such practices into successful strategies [27]. Employees, on their part, react to this strategic focus by initiating innovative steps that drive organizational success. One of the most important features of this conversation is the role that leadership plays as a bridge for the effect of sustainability on innovation. Leaders who embrace sustainable causes strongly encourage a culture in which employees can experiment with new ideas without the fear of failure [28]. This security enables a culture of experimentation and continuous improvement.

3. RESEARCH GAPS AND STUDY OBJECTIVES

a. Despite greater emphasis on leadership and sustainability, few empirical studies have examined their combined impact on employee innovation in the IT industry. All these variables have been examined separately in most research, and there remains a knowledge gap regarding the synergistic effects of these variables. This paper tries to fill this gap by examining:

- b. The direct impact of sustainable business practices on employee innovation.
- c. The role of transformational leadership in fostering innovation.
- d. The mediating effect of leadership in the relationship between sustainability and innovation.

By addressing these objectives, this research contributes valuable insights into how IT organizations can leverage sustainability and leadership to drive innovation and long-term success.

4. RESEARCH METHODOLOGY

4.1. Research Design

This research utilizes a quantitative research design rooted in Structural Equation Modeling (SEM) in investigating the correlation between sustainable business practices, leadership, and employee innovation. The research adopts a cross-sectional research design by obtaining data at a point in time to analyze the effect of these variables.

4.2. Sample and Data Collection

265 IT professionals were randomly selected in a stratified manner to get a mix of job function, gender, and experience. The survey was online and was dispersed through professional networks to capture a representative sample of employees in IT companies. Demographic items, Likert-scale items to measure perceptions of sustainability, leadership, and innovation, and validated scales for statistical reliability were used in the survey.

4.3. Statistical Analysis

Data were analyzed using SEM through AMOS software, which gave a comprehensive assessment of direct and indirect effects. Descriptive statistics were employed to present demographic data, was employed to determine measurement validity and reliability. Model fit was determined using measures like CFI, RMSEA, and SRMR to determine theoretical consistency. Mediation analysis examined the indirect effect of leadership on employee innovation through sustainability practices. Through strict statistical techniques, the research gains empirical validity and explains the impact of sustainable leadership in increasing IT industry innovation. A quantitative survey-based research design was adopted, with IT professionals from different organizations as the target population.

4.4. Sample and Demographics

A total of 265 IT employees participated. Demographic analysis is summarized in Table 1:

Table 1: Demographic Distribution of Participants

Demographic Variable	Category	Frequency	Percentage %
Gender	Male	150	56.6

	Female	115	43.4
Age	20-30	90	34.0
	31-40	120	45.3
	41-50	55	20.7
Education	Bachelor	160	60.4
	Master's	90	34.0
	PhD	15	5.6
Work Experience	<5 years	85	32.1
	5-10 years	120	45.3
	>10 years	60	22.6

Demographic segmentation captures heterogeneity in gender, age, education, and work experience to facilitate findings to be generalizable to different employee segments in IT companies. The sample was 265 IT professionals with gender distribution to capture even representation to avoid gender-based biases while drawing findings. Age profile demonstrated that young professionals (25-35 years) were highly receptive to sustainable business practices, whereas older professionals (more than 10 years of experience) were more reactive towards sustainable leadership, showing a generation shift in work expectations.

5. DATA ANALYSIS

5.1. Descriptive Statistics

Table 2: Descriptive Statistics and Correlation Matrix

Variable	Mean	SD	1	2	3
Sustainable Business Practices (SBP)	4.25	0.85	1		
Leadership Styles (LS)	4.30	0.80	0.58	1	
Employee Innovation (EI)	4.15	0.75	0.62	0.67	1

SBP has a mean of 4.25 (SD = 0.85) and indicates that employees generally feel that their firms are reasonably embracing sustainable business practices. The low standard deviation indicates that the responses were uniform. LS has a mean of 4.30 (SD = 0.80) and indicates that leadership in the IT sector is viewed positively and with a moderate variation in leadership effectiveness among firms. EI has a mean score of 4.15 (SD = 0.75), indicating that employees see themselves as innovative, though lower than how they feel about leadership and sustainability. The lower standard deviation indicates that the sample's perception of innovation is relatively homogeneous. The relationship between SBP and LS (0.58) shows a very strong positive correlation, suggesting that organizations with effective sustainability practices have effective leadership. The relationship between SBP and EI (0.62) suggests sustainable business practice has high influence on employee innovation, which further confirms the workplace environment being sustainability-oriented encourages creativity. The highest relationship is between LS and EI (0.67), suggesting that leadership styles have the highest influence on innovation. Transformational and sustainable leadership styles have strong effects on employees' intention to commit to innovative behaviors. These results indicate that leadership is a central mediator of employee innovation and sustainable business practice. The extremely high correlation values affirm that the presence of organizations with leadership and sustainability is positively correlated with higher levels of organization innovation. The research also confirms that sustainability-led leadership provides a platform on which employees get motivated to innovate, eventually leading the IT industry to long-term growth and competitiveness.

5.2. Model Fit Indices

Table 3: Model Fit Indices

Fit Index	Value	Acceptable Threshold
Chi-Square (χ^2/df)	2.54	< 3
Comparative Fit Index (CFI)	0.94	> 0.90
Root Mean Square Error (RMSEA)	0.05	< 0.08
Standardized Root Mean Square Residual (SRMR)	0.04	< 0.08

The model fit well, which is reflected through good fit index values. This confirms hypothesized relationships in the study. Validity of the hypothesized relationships was confirmed by SEM analysis. Transformational leadership had the largest effect on employee innovation ($\beta = 0.51$, $p < 0.001$), and this is a testimony to the instrumental role of leadership in creating a culture of innovation. Sustainable business practice was a key driver of innovation ($\beta = 0.42$, $p < 0.001$) and placing greater value on ethical and responsible corporate culture. Sustainability also improved the effectiveness of leaders ($\beta = 0.36$, $p < 0.001$), indicating that high-valuing leaders of sustainability are more likely to drive innovation. Model fit measures (CFI = 0.94, RMSEA = 0.05, SRMR = 0.04) confirmed strong consistency with theory predictions, testifying to the strength of the model. Combining demographic results with SEM results, the study provides a full explanation of how sustainable business practices and leadership both contribute to employee innovation in the IT sector.

5.3. Path Analysis and Hypothesis Testing

Table 4: Structural Path Coefficients

Path	Standardized Coefficient (β)	p-value
SBP \rightarrow EI	0.42	<0.001
LS \rightarrow EI	0.51	<0.001
SBP \rightarrow LS	0.36	<0.001

All of the path coefficients are statistical significance, indicating that leadership and sustainability practices both play a significant role in affecting employee innovation. The outcomes of the path analysis reflect interesting findings regarding the cause-and-effect relationships of the research variables: SBP \rightarrow EI ($\beta = 0.42$, $p < 0.001$): Sustainable business practices have a significant positive impact on employee innovation and support the notion that ecologically and ethically sustainable organizations provide an enabling environment for creativity. Sustainability-oriented employees are more motivated and engaged to come up with innovative solutions that are aligned with ethical business models. LS \rightarrow EI ($\beta = 0.51$, $p < 0.001$): Leadership has the strongest effect on employee innovation, which means transformational leadership promotes a culture of experimentation, knowledge sharing, and taking risks. Employees in organizations with effective leadership are more inclined to try out new ideas and contribute to organizational development. SBP \rightarrow LS ($\beta = 0.36$, $p < 0.001$): Sustainable business practices have a positive influence on leadership effectiveness and reveal that those organizations that focus on sustainability as a driver produce leaders who place value on ethical decision-making, corporate citizenship, and strategic long-term orientation. Such leaders inspire employees towards innovative behavior. Combined, these findings set the mediating role of leadership, which verifies that sustainable business practices affect employee innovation indirectly by shaping transformational leadership behaviors. Companies aspiring to stimulate innovation must concentrate on building sustainability-focused leadership to ensure employee creativity and long-term development.

5.4. Mediated Effects Analysis

Table 5: Mediated Effects Analysis

Indirect Path	Standardized Indirect Effect (β)	p-value
SBP \rightarrow LS \rightarrow EI	0.18	<0.001

The results confirm that leadership significantly mediates the relationship between sustainable business practices and employee innovation. The direct effect of SBP on EI ($\beta = 0.42$) remains significant even after including leadership as a mediator, suggesting a partial mediation effect.

5.5. Multi-Group Analysis was conducted to examine differences based on demographic factors:

Table 6: Multi-Group Analysis by Gender

Path	Male (β)	Female (β)	p-value
SBP \rightarrow EI	0.45	0.38	0.078

LS → EI	0.53	0.49	0.102
SBP → LS	0.37	0.34	0.095

The findings show that male and female employees are positively responsive to sustainable business practices and leadership in encouraging innovation. Male staff are slightly more responsive to these relationships, especially SBP → EI ($\beta = 0.45$ vs. 0.38) and LS → EI ($\beta = 0.53$ vs. 0.49). The path coefficients' differences are not significant statistically ($p > 0.05$), which implies that gender does not critically moderate these relationships.

Table 7: Multi-Group Analysis by Age

Path	<35 years (β)	≥ 35 years (β)	p-value
SBP → EI	0.40	0.44	0.067
LS → EI	0.50	0.52	0.089
SBP → LS	0.35	0.38	0.080

Senior workers (≥ 35 years) show a marginally better association between innovation and sustainability (SBP → EI, $\beta = 0.44$) than junior workers (<35 years, $\beta = 0.40$). Analogously, innovation leadership is marginally greater among senior workers ($\beta = 0.52$) than junior workers ($\beta = 0.50$). This indicates that older workers are likely to appreciate systematic efforts towards sustainability and leadership, though statistically insignificant differences persist.

Table 8: Multi-Group Analysis by Education

Path	Bachelor's (β)	Master's & Above (β)	p-value
SBP → EI	0.41	0.43	0.072
LS → EI	0.48	0.54	0.095
SBP → LS	0.33	0.39	0.085

Staff holding a master's degree and above have stronger correlations between leadership and innovation ($\beta = 0.54$) than those holding a bachelor's degree only ($\beta = 0.48$). SBP → LS is also higher among holders of higher education ($\beta = 0.39$) than bachelor's degree holders ($\beta = 0.33$), which may suggest that more highly educated staff may be more open to leadership-focused sustainability practices. No difference exists, however, for SBP → EI.

Table 9: Multi-Group Analysis by Work Experience

Path	<10 years (β)	≥ 10 years (β)	p-value
SBP → EI	0.38	0.46	0.059
LS → EI	0.49	0.55	0.077
SBP → LS	0.34	0.40	0.068

Those who possess more than 10 years of experience exhibit greater sensitivity towards all the lines, especially SBP → EI ($\beta = 0.46$) and LS → EI ($\beta = 0.55$). It proves that seasoned professionals are more sensitive towards the advantages of sustainable leadership towards innovation. The younger staff (<10 years) mirror the weaker but still significant correlation, and it proves that leadership for sustainability yields innovation at all levels.

6. DISCUSSION AND IMPLICATIONS

The study shows that leadership acts as a mediator between innovation by the employees and sustainable practices. Organizations with stronger sustainability and transformational leadership have higher employee innovation levels. This present study's findings show valuable implications of the impact of sustainable business practices and leadership on employee innovation within the IT sector.

6.1. Theoretical Implications

This study adds to the emerging body of literature on leadership and sustainability by illustrating the mediating effect of transformational leadership in influencing employee innovation. Findings affirm that sustainable practices by

themselves cannot stimulate innovation but are instead an intermediate that transforms sustainability programs into actual employee inputs. This emphasizes the need for leadership development programs focusing on sustainability and innovation in order to drive organizational cultures forward. Additionally, the study confirms that sustainable business practice develops leaders to perform better. Sustainable leaders are visionary, ethical, and employee development, leading to a culture of innovation. The research adds to the available theories on leadership and sustainability, providing a holistic approach to their relationship in innovation.

6.2. Managerial Implications

For IT organizations, the research highlights the need to integrate sustainability into leadership models. Firms must invest in leadership development programs that focus on values of sustainability, ethical decision-making, and innovation-led strategies. Transformational leadership styles can be developed to promote a culture of openness, collaboration, and experimentation, which can result in higher levels of innovation. Firms must integrate sustainability objectives into employee performance measurement and innovation rewards. Enabling workers with the capability, autonomy, and drive to pursue sustainable innovation projects can reap long-term competitive rewards. Employee well-being and ethical operations also need to be prioritized by companies as they are integral parts of a healthy work culture that encourages innovation.

6.3. Policy Implications

At a more macro level, policymakers and IT sector regulators must promote sustainability-led leadership frameworks for the IT industry. Promoting environmentally friendly computer practices, responsible AI deployment, and socially accountable innovation among businesses can make industry practices converge with world sustainability agendas. Incentives like tax relief, grants, and awards to businesses that proactively mainstream sustainability into leadership and innovation frameworks can also trigger large-scale uptake.

7. CONCLUSION

This research unfolds the most significant contribution of sustainable business practices and leadership towards framing employee innovation in the IT sector. The findings of the research affirm the great contribution of transformational leadership towards innovation by inducing an appreciative culture that promotes creative problem-solving and risk-taking. Sustainable business practices are also uncovered as a vital component that enhances the efficacy of leadership further affirming the positive contribution to innovation. By integrating sustainability within leadership theories, organizations can craft a culture that is not just founded on sustainable long-term environmental and moral stewardship but one that fosters ongoing innovation too. Based on the empirical proof, it becomes probable for firms that make expenditures on business practice and sustainable development of leadership to attain increased employee levels of engagement and innovation. Demographic findings of the current study also indicate that despite non-statistically significant gender differences, employees who have extensive experience in work are more attuned to sustainable leadership practices. This further supports the need to personalize leadership development programs based on multiple employee backgrounds and experiences. For information technology companies that aspire to stay in the game within a rapidly changing sector, embracing sustainability in leadership is not merely an ethical call but also a strategic call. Organizational and regulatory policies to promote sustainability leadership should be favoured to create an employee base that is not merely innovative but is also dedicated to sustainable development targets.

8. FUTURE RESEARCH DIRECTIONS

As important as this work is, still more could look at the longer-term effects on organizational performance and employee innovation. Longitudinal research on sustainable leadership development and adaptation to advances in technology as well as legislation would be great. Cross-sectoral comparisons also might reveal further about variation of leadership and sustainability dynamics across industries. By incorporating sustainability into innovation and leadership planning, IT organizations can drive significant change, creating an ethical culture of innovation that serves business and broader society.

REFERENCE

- [1] Akram, T., Lei, S., & Jamal, M. (2016). The impact of relational leadership on employee innovative work behavior in IT industry of China. *ArabEconomic & Business Journal*, 11, 153–161

- [2] Hana, U. (2013). Competitive Advantage Achievement through Innovation and Knowledge. *Journal of Competitiveness*, 5(1), 82–96.
- [3] Kesting, P., Ulhøi, J. P., Song, L. J., & Niu, H. (2015). The impact of leadership styles on innovation management - a review and a synthesis. *Journal of Innovation Management*, 3(4), 22–41.
- [4] G. Gokulkumari, M. Ravichand, P. Nagpal and R. Vij, "Analyze the political preference of a common man by using data mining and machine learning," 2023 International Conference on Computer Communication and Informatics (ICCCI), Coimbatore, India, 2023, pp. 1-5, doi: 10.1109/ICCCI56745.2023.10128472.
- [5] P. Nagpal, A. Pawar and S. H. M, "Predicting Employee Attrition through HR Analytics: A Machine Learning Approach," (2024). 4th International Conference on Innovative Practices in Technology and Management (ICIPTM), Noida, India, pp. 1-4, doi: 10.1109/ICIPTM59628.2024.10563285.
- [6] Neubert, M. J., Hunter, E. M., & Tolentino, R. C. (2016). A servant leader and their stakeholders : When does organizational structure enhance a leader's influence ?. *The Leadership Quarterly*, 27(6).
- [7] Yoon, S. N., DonHeeLee, & Schniederjans, M. (2016). Effects of innovation leadership and supply chain innovation on supply chain efficiency : Focusing on hospital size. *Technological Forecasting & Social Change*, 113, 412–421
- [8] P. Nagpal, A. Pawar and S. H. M, "Predicting Employee Attrition through HR Analytics: A Machine Learning Approach," 2024 4th International Conference on Innovative Practices in Technology and Management (ICIPTM), Noida, India, 2024, pp. 1-4, doi: 10.1109/ICIPTM59628.2024.10563285.
- [9] P. Nagpal, "The Transformative Influence of Artificial Intelligence (AI) on Financial Organizations Worldwide," 2023 IEEE International Conference on ICT in Business Industry & Government (ICTBIG), Indore, India, 2023, pp. 1-4, doi: 10.1109/ICTBIG59752.2023.10455998.
- [10] Tan, Y., Shuai, C., Shen, L., Hou, L., & Zhang, G. (2020). A study of sustainable practices in the sustainability leadership of international contractors. *Sustainable Development*, 28(4), 697–710.
- [11] P. William, A. Shrivastava, H. Chauhan, P. Nagpal, V. K. T. N and P. Singh, "Framework for Intelligent Smart City Deployment via Artificial Intelligence Software Networking," 2022 3rd International Conference on Intelligent Engineering and Management (ICIEM), London, United Kingdom, 2022, pp. 455-460, doi: 10.1109/ICIEM54221.2022.9853119.
- [12] Holton, I., Glass, J., & Price, A. D. (2010). Managing for sustainability: Findings from four company case studies in the UK precast concrete industry. *Journal of Cleaner Production*, 18(2), 152–160.
- [13] R. Bhattacharya, Kafila, S. H. Krishna, B. Haralayya, P. Nagpal and Chitsimran, "Modified Grey Wolf Optimizer with Sparse Autoencoder for Financial Crisis Prediction in Small Marginal Firms," 2023 Second International Conference on Electronics and Renewable Systems (ICEARS), Tuticorin, India, 2023, pp. 907-913, doi: 10.1109/ICEARS56392.2023.10085618.
- [14] S. H. Abbas, S. Sanyal, P. Nagpal, J. Panduro-Ramirez, R. Singh and S. Pundir, "An Investigation on a Blockchain Technology in Smart Certification Model for Higher Education," 2023 10th International Conference on Computing for Sustainable Global Development (INDIACom), New Delhi, India, 2023, pp. 1277-1281.
- [15] Rajagopal, N. K., Anitha, L., Nagpal, P., & Jitendra, G. (2024). Green HR techniques: A sustainable strategy to boost employee engagement. In *Advancements in business for integrating diversity and sustainability: How to create a more equitable and resilient business world in the developing world* (pp. 104-107). Routledge.
- [16] P Nagpal, Avinash Pawar, Sanjay. H.M. (2024). Sustainable Entrepreneurship: Balancing Push and Pull Factors for Customer Loyalty In Organic Product Marketing. *African Journal of Biological Sciences (South Africa)* 6 (9), 1134-1144. doi: 10.33472/AFJBS.6.9.2024.1134-1144.
- [17] F. A. Syed, N. Bargavi, A. Sharma, A. Mishra, P. Nagpal and A. Srivastava, "Recent Management Trends Involved With the Internet of Things in Indian Automotive Components Manufacturing Industries," 2022 5th International Conference on Contemporary Computing and Informatics (IC3I), Uttar Pradesh, India, 2022, pp. 1035-1041, doi: 10.1109/IC3I56241.2022.10072565.
- [18] McCann, J. T., & Holt, R. A. (2010). Servant and sustainable leadership: An analysis in the manufacturing environment. *International Journal of Management Practice*, 4(2), 134–148.
- [19] Anurag Shrivastavaa , S. J. Suji Prasadb , et al (2023). IoT Based RFID Attendance Monitoring System of Students using Arduino ESP8266 & Adafruit.io on Defined Area. *Cybernetics and Systems: An International Journal*. <https://doi.org/10.1080/01969722.2023.2166243>.

-
- [20] Pooja Nagpal., (2022). Organizational Commitment as an Outcome of Employee Engagement: A Social Exchange Perceptive using a SEM Model. *International Journal of Biology Pharmacy and Allied Science*,11(1): 72-86
 - [21] BK Kumari, VM Sundari, C Praseeda, P Nagpal, J EP, S Awasthi (2023), Analytics-Based Performance Influential Factors Prediction for Sustainable Growth of Organization, Employee Psychological Engagement, Work Satisfaction, Training and Development. *Journal for ReAttach Therapy and Developmental Diversities* 6 (8s), 76-82.
 - [22] Akilandeewari, S. V., Nagpal, P., Vinotha, C., Jain, K., Chatterjee, R., & Gundavarapu, M. R. (2024). Transforming e-commerce: Unleashing the potential of dynamic pricing optimization through artificial intelligence for strategic management. *Migration Letters*, 21(S3), 1250–1260.
 - [23] Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. *Academy of Management Annals*, 11(2), 733–769.
 - [24] Pooja Nagpal, C. Vinotha, Lucky Gupta, Gunjan Sharma, Khyati Kapil, Vijay Kumar Yadav, Akhil Sankhyan. (2024). Machine Learning and Ai in Marketing–Connecting Computing Power to Human Insights. *International Journal of Intelligent Systems and Applications in Engineering*, 12(21s), 548–561. <https://ijisae.org/index.php/IJISAE/article/view/5451>
 - [25] Lakshmi, J.Divya, Pooja Nagpal, et al., (2021). Stress and Behavioral Analysis of Employees using Statistical & Correlation Methods. *International Journal of Aquatic Science* 12(01), 275-281. ISSN: 2008- 8019 2021
 - [26] Namita Rajput, Gourab Das, et al (2023) . An inclusive systematic investigation of human resource management practice in harnessing human capital, *Materials Today: Proceedings*, 80 (3), 3686- 3690, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2021.07.362>
 - [27] Arnold, K. A. (2017). Transformational leadership and employee psychological well-being: A review and directions for future research. *Journal of Occupational Health Psychology*, 22(3), 381.
 - [28] Kuntz, J. R., Näswall, K., & Malinen, S. (2016). Resilient employees in resilient organizations: Flourishing beyond adversity. *Industrial and Organizational Psychology*, 9(2), 456–462.