

# Synergizing Innovation in HR & Performance: Navigating the Interplay of Employee Innovative-Work Behaviour & Capabilities within the Context of Pharmaceutical Industry of Pakistan

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## *Abstract*

*This study investigates the intricate relationships among innovative HR practices, innovation capabilities, innovative work behaviour, digital adoption, transformational leadership, and employee performance within the pharmaceutical industry of Pakistan. The present investigation employed a cross-sectional study design and a non-probability convenience sampling approach to gather data from employees in the pharmaceutical companies located in Karachi, Pakistan. To investigate these relationships, data from 305 employees of different pharmaceutical companies in Karachi were analysed using a structural equation modelling technique. The results reveal that implementing innovative HR practices significantly impacts employee performance by enhancing innovation capabilities and encouraging innovative work behaviour. Additionally, the study demonstrates the moderating role of the Technology Acceptance Model and Transformational Leadership in shaping these relationships, highlighting the contextual complexity within the pharmaceutical sector. The findings emphasize the importance of fostering innovation capabilities and promoting innovative work behaviour among employees to improve organizational performance. Moreover, the influence of digital adoption and transformational leadership underscores the need for organizations to leverage technology and effective leadership to maximize the benefits of HR innovation. While previous research has explored the impact of HR innovation on firm performance, this study uniquely considers the role of digital adoption in shaping the effectiveness of HR practices. Moreover, the examination of innovative work behaviour as a mediating factor adds a new dimension to our understanding of how employees engage with HR innovations and contribute to organizational success. By incorporating these innovative elements into the research framework, this study offers fresh insights into the dynamics of HR innovation and its implications for employee performance.*

**Keywords:** *Innovative HR practices, Innovative Work Behavior, Digital Adoption, Transformational Leadership, Employee Performance, Innovation Capabilities.*

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## **Introduction**

In the dynamic landscape of Pakistan's pharmaceutical industry, integrating innovation into Human Resources (HR) practices has become crucial (Babar et al., 2019). The sector, valued at 1.64 billion US dollars with an annual growth of 11%, surpasses global pharmaceutical industry growth. To fortify

competitiveness, robust HR practices promoting innovation, talent management, and regulatory compliance are essential. The industry's rapid technological and market changes necessitate strategic realignment of HR to support innovation, employee performance, and organizational resilience (Zhou et al., 2019).

Empirical research is lacking in establishing a clear link between HR management techniques, innovative work behaviors, transformational leadership, and tangible outcomes like employee performance and organizational success (Babar et al., 2019 & Eisenbeiss et al., 2018). This gap hinders the industry's ability to adapt to swift transformations.

HR practices, including online platforms, training sessions, flexible work arrangements, and health initiatives, enhance innovation, productivity, and employee well-being. The study aims to explore how innovative HR practices, coupled with transformative leadership, impact employee performance, creativity, and contribute to the growth of pharmaceutical companies in Pakistan (Babar et al., 2019 & Eisenbeiss et al., 2008). Given the rapid technological advancements in Karachi's pharmaceutical sector, HR intervention is critical to prevent skill obsolescence and promote continual learning (Mesko et al., 2018). Researchers emphasize the need for considerate the effects of innovative HR practices on employee performance.

### Research Questions

- RQ1. To what extent Innovative HR practices impact overall Employee Performance?
- RQ2. Does Innovation Capabilities mediate and Digital Adoption moderate the relationship between Innovative HR practices and Employee Performance?
- RQ3. In what ways does Innovative Work Behavior mediate the connection between Innovative HR practices and the various dimensions of Employee Performance?
- RQ4. What is the moderating effect of Transformational Leadership on the relationship between Innovation Capabilities and Employee Performance?

### Literature Review

#### Innovative HRM Practices on Employee Performance

Innovative HR practices, as conceptualized by Wright and McMahan (2011), extend beyond traditional administrative functions, becoming a strategic driver for organizational success. This encompasses Human Resource Development (HRD), recruitment, redeployment, retraining, performance appraisal, and reward policies. The innovative role of HRD focuses on continual learning and flexibility, utilizing technology-enabled platforms and personalized development programs (Marquardt & Waddill, 2004). Recruitment practices, influenced by artificial intelligence and machine learning, streamline candidate matching and enhance diversity in talent acquisition (Jiménez-Jiménez & Sanz-Valle, 2005; Rees and Smith, 2017).

Amid shifting market conditions, innovative redeployment and retraining strategies, as emphasized by Abdullah et al. (2014), involve customized training and the recognition of transferable skills to promote employee innovativeness. Innovative performance appraisal, a critical HR practice, drives innovation through ongoing feedback and technological tools (DeNisi & Murphy, 2017). Compensation and reward policies, beyond traditional structures, encourage excellence and innovation through incentive-based plans, contributing to a culture that values and rewards innovation (Hafiza et al., 2011; Lawler & Boudreau, 2015).

Robin (1998), referenced by (M'Mbui, 2011), states that performance can be affected by personality, values, attitudes, and competence, which is a mix of perception and motivation. Task performance, reflecting core job duties, is crucial for individual competence and motivation (Robin, 1998; Koopmans et al., 2011). Contextual performance, akin to organizational citizenship behavior, reflects positive organizational culture and a pleasant working environment (Organ, 1998; Spector and Fox, 2005).

Counterproductive work behavior, involving harm and purposeful damage, must be understood for maintaining a competitive edge (Pelin and Funda, 2013). Different practices have been examined, and researchers have used a variety of methodologies to gauge how these practices affect employee performance. For example, Guthrie et al. (2002) assessed employee commitment and performance using a wide range of twelve HRM practices, such as information sharing, attitude surveys, teamwork, internal promotions, performance management, skill-based pay, group-based pay, employee stock ownership, cross-training, training centered on future expertise necessities, employee participatory plans, and training. Additionally, Gollan and Davis (1999) emphasized how high participation practices including effective communication and consultation methods boost organizational productivity and effectiveness, which in turn links these practices to improved employee performance.

From this discussion, this study presents the following hypothesis:

**H1:** Innovative HR practices have a significant impact on Employee Performance.

### **Innovative HRM and Employee Performance influenced by Innovation Capabilities and Transformational Leadership**

Innovation capabilities, crucial for organizational innovation, encompass knowledge acquisition, leadership styles, and corporate culture (Teece, 2007). Participatory leadership cultures, emphasizing open communication and staff involvement, significantly impact innovative work behavior (West & Anderson, 1996). Siriyanum et al. (2019) utilize employee participation, incentives, and skill development to gauge commitment, highlighting the mediation of supportive leadership and inspirational communication in the connection between innovative HR practices and commitment (Meyer & Smith, 2009). Latorre et al. (2016) find a correlation between creative HRM practices and employee performance, mediated by perceived organizational support. Siriyanum et al. (2019) observe positive impacts of HRD practices on supply chain integration, emphasizing the benefits of workplace democracy. Farndale et al. (2011) explore manager trust and fairness perceptions in performance management, revealing a favorable association between creative HRM techniques, mediated by trust and leadership, and employee commitment.

Transformational leadership, as articulated by Burns (1978) and expanded upon by Bass (1985), distinguishes itself from transactional leadership through a visionary approach, inspiring followers to surpass expectations by altering attitudes and values. Key components encompass a leader's visionary articulation of the future, inspirational communication, intellectual stimulation, and supportive leadership (Bass & Riggio, 2006; Avolio & Bass, 1995). Personal recognition, acknowledging team contributions, further enhances the positive impact (Kouzes & Posner, 2017).

In examining the relationship between employee welfare and innovative HRM practices, Boxall and Macky (2014) find that increased task assignments correlate with improved satisfaction and work-life balance. Guerrero and Didier (2007) highlight the significant influence of Participatory Leadership and empowerment on business performance in French firms, while pay has little effect. Huo et al. (2015) emphasize the positive correlation between supply chain integration and employee participation through engagement strategies, fostering shared values and enhancing productivity.

Based on this discussion, this study proposes the following hypotheses:

**H2:** Innovation Capabilities mediates the relationship between Innovative HR practices and Employee Performance.

**H4:** Innovation Capabilities is significantly moderated by Transformational Leadership on Employee Performance.

### **Innovative HRM and innovative work behavior**

Innovative Work Behavior (IWB) refers to employees' actions aimed at initiating, promoting, and implementing novel ideas within an organization to enhance work processes, products, or services (Janssen, 2000). It encompasses activities like opportunity exploration, idea generation, idea championing, and idea realization, contributing to the innovation process. Opportunity exploration involves actively seeking chances for innovation, while idea generation focuses on creating fresh ideas in a collaborative work atmosphere. Idea championing involves advocating for innovative initiatives, and idea realization is about translating innovative ideas into applicable goods or solutions (Van de Ven, 1986; Damanpour, 1991). Research indicates that HRM practices, broadly defined by Boxall and Macky (2009), contribute to organizational innovation and impact individual innovation, leading to IWB. This investigation stresses the moderating role of employee empowerment in the relationship between innovative HR practices and IWB, exploring the influence of IWB on innovative HRM practices and employee performance. Trust among individuals is crucial for open communication and idea sharing, contributing to knowledge generation. Previous research suggests that human resource practices positively impact creative work behavior and serve as strong predictors of IWB.

**H3:** Innovative Work Behavior mediates the relationship between Innovative HR practices & Employee Performance.

### **Digital Adoption**

Digital adoption refers to the process of individuals and organizations effectively integrating and utilizing digital technologies in daily operations to achieve desired outcomes and maximize benefits (Dholakia et al., 2004). The perceived usefulness of a digital technology, indicating its impact on performance and productivity, influences its adoption. The Technology Acceptance Model (TAM), introduced by Davis (1989), emphasizes that people are more likely to adopt technology perceived as valuable. Highlighting the importance of perceived ease of use, TAM suggests that user-friendly technology is more likely to be adopted. Organizations can facilitate digital adoption by emphasizing benefits, user interface design, training, and support.

This research hypothesises, therefore, that the following:

**H5:** Innovative HR practices is significantly moderated by Digital Adoption on Innovation Capabilities.

### **Theoretical Framework**

The study relies on Gary Becker's Human Capital Theory (1964), highlighting the significant impact of investing in employees' knowledge and skills on organizational success. It emphasizes HR practices as strategic investments in human capital, emphasizing training and skill development for enhanced productivity (Becker, 1964; Schultz, 1961). The study aligns with the theory, focusing on participative leadership culture and work climate as influencers on human capital development (Bontis, 1999). It correlates Theory's claim of increased creativity with its examination of inventive work behavior, supported by empirical evidence (Becker, 1993; Wang & Huang, 2019). Incorporating Technology Acceptance Model (TAM), the study explores how digital adoption influences HR innovation and capabilities, focusing on perceived utility and ease of use (Davis, 1989). It underscores the importance of understanding employee perceptions for enhancing HR innovation and overall performance.

Table 1: Instrumentation for the Questionnaire

| Code  | Variables   | Items | Source   |
|-------|---|-------|--|
| InHR  | Innovation in HR practices                        |       | Agarwal et al., 2017   |
| InHRD | -Innovative Role of HRD                           | 7     |  |
| InPR  | -Innovative practices for Recruitment             | 3     |  |
| InPRR | -Innovative practices for redeployment-retraining | 3     |  |
| InPPA | -Innovative practices for performance appraisal   | 5     |  |
| InPRC | -Innovative practices for reward & compensation   | 3     |  |
| EP    | Employee Performance                              |       | Koopmans, 2015   |
| TP    | -Task Performance                                 | 5     |  |
| CP    | -Contextual Performance                           | 5     |  |
| CWP   | -Counterproductive Work Behavior                  | 8     |  |
| IWB   | Innovative Work Behaviour                         |       | De Jong and Den Hartog, 2010;  |
| OE    | -Opportunity exploration                          | 3     | Kleysen and Street, 2001   |
| IG    | -Idea generation                                  | 4     |  |
| ICH   | -Idea Championing                                 | 4     |  |
| IR    | -Idea Realization                                 | 6     |  |
| IC    | Innovation Capabilities                           | 14    | c.f., Adams et al., 2006;<br>Crossan and Apaydin, 2010;<br>Saunila, 2016 |
| TL    | Transformational Leadership                       |       |  |
| VIS   | -Vision   | 3     | House, 1998; Podsakoff et al.,   |
| ICOM  | -Inspirational communication                      | 3     | 1990   |
| IS    | -Intellectual Stimulation                         | 3     |  |
| SL    | -Supportive Leadership                            | 3     |  |
| PR    | -Personal Recognition                             | 3     |  |
| DA    | Digital Adoption                                  |       | The Technology Acceptance  |
|       | -Perceived usefulness                             | 6     | Model (Davis, 1989)  |
|       | -Perceived ease of use                            | 6     |  |



Figure 1 : Proposed Model



## Methodology

This study focuses on workers from different pharmaceutical companies in Karachi, where as of 2024, 313 companies employ over 500,000 people in the pharmaceutical industry. Given this demographic's direct involvement in and impact on the topic of HR innovation influencing employee performance, questionnaires were distributed to individuals both physically and electronically. The study uses a quantitative approach using a cross-sectional research technique and surveys with a 5-point Likert scale for measuring (1 = "strongly disagree" to 5 = "strongly agree"). In the context of Karachi's pharmaceutical industry, the study attempts to investigate the connection between variables and concepts with the aim of presenting an explanation. Employing convenience sampling, the study targets 305 responses from the industry, surpassing the minimum recommended sample size of 350.

## Results

### Respondent's Profile

Table 2: Demographic Profile

| Characteristics                | Frequency  | Percentage |
|--------------------------------|------------|------------|
| <b>Gender</b>                  |            |            |
| Male                           | 195        | 63.9       |
| Female                         | 110        | 36.1       |
| <b>Age(years)</b>              |            |            |
| 26-30                          | 45         | 14.8       |
| 31-35                          | 36         | 11.8       |
| 36-40                          | 19         | 6.2        |
| 41-45                          | 15         | 4.9        |
| Above 46                       | 15         | 4.9        |
| <b>Education Level</b>         |            |            |
| Bachelor                       | 157        | 51.5       |
| Masters                        | 148        | 48.5       |
| <b>Work Experience (years)</b> |            |            |
| <1                             | 12         | 3.9        |
| 1-3                            | 158        | 51.8       |
| 11-20                          | 8          | 2.6        |
| 4-6                            | 90         | 29.5       |
| 7-10                           | 37         | 12.1       |
| <b>Total</b>                   | <b>305</b> | <b>100</b> |

Table 2 shows 34.1% of respondents are female and 65.9% are male. This demographic analysis reveals the industry's gender composition, motivating further research into gender-related employee behaviour and performance aspects. As the largest age group at 14.8%, "31-35" deserves special attention due to its importance in the workforce and its impact on HR innovations, creative work behavior, and openness to transformational leadership. The majority have bachelor's degrees (51.5%) or master's (48.5%), demonstrating the industry's educated workforce. The diverse experience level, with 51.8% employed for 1-3 years, suggests turnover issues. HR innovation, leadership, and employee success depend on employment term. Longer tenured employees respond differently to HR advances, behave differently than shorter tenured employees.

**Model for Measurement**

Table 3: Construct reliability and validity

|               | Mean  | Loadings | P- values | CR     | AVE   |
|---------------|-------|----------|-----------|--------|-------|
| CP1 <- CP     | 0.882 | 0.883    | 0.000     |        |       |
| CP2 <- CP     | 0.662 | 0.662    | 0.000     |        |       |
| CP3 <- CP     | 0.760 | 0.760    | 0.000     |        |       |
| CP4 <- CP     | 0.742 | 0.743    | 0.000     | 0.885  | 0.588 |
| CP5 <- CP     | 0.713 | 0.713    | 0.000     |        |       |
| CP6 <- CP     | 0.892 | 0.893    | 0.000     |        |       |
| CP7 <- CP     | 0.786 | 0.787    | 0.000     |        |       |
| CP8 <- CP     | 0.436 | 0.435    | 0.000     |        |       |
| CWP1 <- CWP   | 0.967 | 0.967    | 0.000     |        |       |
| CWP2 <- CWP   | 0.965 | 0.965    | 0.000     |        |       |
| CWP3 <- CWP   | 0.959 | 0.959    | 0.000     | 0.8850 | 0.702 |
| CWP4 <- CWP   | 0.623 | 0.625    | 0.000     |        |       |
| CWP5 <- CWP   | 0.575 | 0.577    | 0.000     |        |       |
| DA1 <- DA     | 0.599 | 0.599    | 0.000     |        |       |
| DA10 <- DA    | 0.775 | 0.776    | 0.000     |        |       |
| DA2 <- DA     | 0.676 | 0.676    | 0.000     |        |       |
| DA3 <- DA     | 0.771 | 0.770    | 0.000     |        |       |
| DA4 <- DA     | 0.779 | 0.780    | 0.000     | 0.915  | 0.569 |
| DA5 <- DA     | 0.797 | 0.797    | 0.000     |        |       |
| DA6 <- DA     | 0.792 | 0.792    | 0.000     |        |       |
| DA7 <- DA     | 0.817 | 0.817    | 0.000     |        |       |
| DA8 <- DA     | 0.742 | 0.743    | 0.000     |        |       |
| DA9 <- DA     | 0.767 | 0.768    | 0.000     |        |       |
| IC1 <- IC     | 0.933 | 0.933    | 0.000     |        |       |
| IC10 <- IC    | 0.642 | 0.644    | 0.000     |        |       |
| IC11 <- IC    | 0.565 | 0.568    | 0.000     |        |       |
| IC12 <- IC    | 0.911 | 0.910    | 0.000     |        |       |
| IC13 <- IC    | 0.530 | 0.532    | 0.000     |        |       |
| IC14 <- IC    | 0.951 | 0.950    | 0.000     |        |       |
| IC2 <- IC     | 0.945 | 0.944    | 0.000     | 0.937  | 0.557 |
| IC3 <- IC     | 0.906 | 0.905    | 0.000     |        |       |
| IC4 <- IC     | 0.952 | 0.951    | 0.000     |        |       |
| IC5 <- IC     | 0.558 | 0.559    | 0.000     |        |       |
| IC6 <- IC     | 0.551 | 0.554    | 0.000     |        |       |
| IC7 <- IC     | 0.529 | 0.532    | 0.000     |        |       |
| IC8 <- IC     | 0.572 | 0.574    | 0.000     |        |       |
| IC9 <- IC     | 0.573 | 0.575    | 0.000     |        |       |
| ICH1 <- IWB   | 0.726 | 0.726    | 0.000     |        |       |
| ICH1 <- ICH   | 0.818 | 0.818    | 0.000     |        |       |
| ICH2 <- ICH   | 0.868 | 0.869    | 0.000     |        |       |
| ICH2 <- IWB   | 0.741 | 0.742    | 0.000     | 0.852  | 0.693 |
| ICH3 <- ICH   | 0.830 | 0.830    | 0.000     |        |       |
| ICH3 <- IWB   | 0.715 | 0.716    | 0.000     |        |       |
| ICH4 <- ICH   | 0.812 | 0.812    | 0.000     |        |       |
| ICH4 <- IWB   | 0.718 | 0.718    | 0.000     |        |       |
| ICOM1 <- TL   | 0.894 | 0.893    | 0.000     |        |       |
| ICOM1 <- ICOM | 0.805 | 0.802    | 0.000     | 0.724  | 0.629 |
| ICOM2 <- TL   | 0.532 | 0.533    | 0.000     |        |       |

|                 |       |       |       |       |       |
|-----------------|-------|-------|-------|-------|-------|
| ICOM2 <- ICOM   | 0.787 | 0.789 | 0.000 |       |       |
| ICOM3 <- ICOM   | 0.784 | 0.788 | 0.000 |       |       |
| ICOM3 <- TL     | 0.568 | 0.570 | 0.000 |       |       |
| IG1 <- IWB      | 0.669 | 0.670 | 0.000 |       |       |
| IG1 <- IG       | 0.782 | 0.783 | 0.000 |       |       |
| IG2 <- IWB      | 0.669 | 0.670 | 0.000 |       |       |
| IG2 <- IG       | 0.843 | 0.844 | 0.000 | 0.837 | 0.673 |
| IG3 <- IG       | 0.859 | 0.860 | 0.000 |       |       |
| IG3 <- IWB      | 0.711 | 0.712 | 0.000 |       |       |
| IG4 <- IWB      | 0.660 | 0.660 | 0.000 |       |       |
| IG4 <- IG       | 0.791 | 0.792 | 0.000 |       |       |
| IR1 <- IWB      | 0.790 | 0.790 | 0.000 |       |       |
| IR1 <- IR       | 0.799 | 0.799 | 0.000 |       |       |
| IR2 <- IR       | 0.879 | 0.879 | 0.000 |       |       |
| IR2 <- IWB      | 0.824 | 0.824 | 0.000 |       |       |
| IR3 <- IWB      | 0.802 | 0.803 | 0.000 |       |       |
| IR3 <- IR       | 0.883 | 0.883 | 0.000 | 0.920 | 0.717 |
| IR4 <- IWB      | 0.779 | 0.779 | 0.000 |       |       |
| IR4 <- IR       | 0.878 | 0.878 | 0.000 |       |       |
| IR5 <- IWB      | 0.740 | 0.740 | 0.000 |       |       |
| IR5 <- IR       | 0.821 | 0.821 | 0.000 |       |       |
| IR6 <- IR       | 0.812 | 0.813 | 0.000 |       |       |
| IR6 <- IWB      | 0.730 | 0.730 | 0.000 |       |       |
| IS1 <- IS       | 0.806 | 0.808 | 0.000 |       |       |
| IS1 <- TL       | 0.508 | 0.509 | 0.000 |       |       |
| IS2 <- TL       | 0.533 | 0.534 | 0.000 | 0.803 | 0.719 |
| IS2 <- IS       | 0.909 | 0.910 | 0.000 |       |       |
| IS3 <- TL       | 0.520 | 0.522 | 0.000 |       |       |
| IS3 <- IS       | 0.823 | 0.823 | 0.000 |       |       |
| InHRD1 <- InHRD | 0.994 | 0.994 | 0.000 |       |       |
| InHRD2 <- InHRD | 0.994 | 0.994 | 0.000 | 0.921 | 0.879 |
| InHRD3 <- InHRD | 0.997 | 0.997 | 0.000 |       |       |
| InPPA1 <- InPPA | 0.811 | 0.812 | 0.000 |       |       |
| InPPA2 <- InPPA | 0.889 | 0.889 | 0.000 | 0.823 | 0.739 |
| InPPA3 <- InPPA | 0.875 | 0.876 | 0.000 |       |       |
| InPR1 <- InPR   | 0.988 | 0.988 | 0.000 |       |       |
| InPR2 <- InPR   | 0.973 | 0.973 | 0.000 | 0.981 | 0.963 |
| InPR3 <- InPR   | 0.984 | 0.984 | 0.000 |       |       |
| InPRC1 <- InPRC | 0.676 | 0.679 | 0.000 |       |       |
| InPRC2 <- InPRC | 0.943 | 0.942 | 0.000 | 0.764 | 0.674 |
| InPRR1 <- InPRR | 0.841 | 0.841 | 0.000 |       |       |
| InPRR2 <- InPRR | 0.858 | 0.859 | 0.000 | 0.815 | 0.730 |
| InPRR3 <- InPRR | 0.861 | 0.862 | 0.000 |       |       |
| OE1 <- OE       | 0.867 | 0.867 | 0.000 |       |       |
| OE1 <- IWB      | 0.550 | 0.550 | 0.000 |       |       |
| OE2 <- OE       | 0.876 | 0.876 | 0.000 | 0.837 | 0.754 |
| OE2 <- IWB      | 0.584 | 0.584 | 0.000 |       |       |
| OE3 <- OE       | 0.862 | 0.861 | 0.000 |       |       |
| OE3 <- IWB      | 0.578 | 0.577 | 0.000 |       |       |
| PR1 <- TL       | 0.816 | 0.815 | 0.000 |       |       |
| PR1 <- PR       | 0.862 | 0.862 | 0.000 | 0.701 | 0.632 |
| PR2 <- TL       | 0.526 | 0.529 | 0.000 |       |       |



|             |       |       |       |       |       |
|-------------|-------|-------|-------|-------|-------|
| PR2 <- PR   | 0.600 | 0.604 | 0.000 |       |       |
| PR3 <- PR   | 0.888 | 0.887 | 0.000 |       |       |
| PR3 <- TL   | 0.897 | 0.896 | 0.000 |       |       |
| SL1 <- TL   | 0.785 | 0.785 | 0.000 |       |       |
| SL1 <- SL   | 0.841 | 0.842 | 0.000 |       |       |
| SL2 <- TL   | 0.886 | 0.886 | 0.000 | 0.678 | 0.614 |
| SL2 <- SL   | 0.885 | 0.885 | 0.000 |       |       |
| SL3 <- TL   | 0.512 | 0.513 | 0.000 |       |       |
| SL3 <- SL   | 0.591 | 0.593 | 0.000 |       |       |
| TP1 <- TP   | 0.971 | 0.971 | 0.000 |       |       |
| TP2 <- TP   | 0.971 | 0.970 | 0.000 |       |       |
| TP3 <- TP   | 0.806 | 0.807 | 0.000 | 0.910 | 0.750 |
| TP4 <- TP   | 0.577 | 0.579 | 0.000 |       |       |
| TP5 <- TP   | 0.938 | 0.938 | 0.000 |       |       |
| VIS1 <- TL  | 0.836 | 0.835 | 0.000 |       |       |
| VIS1 <- VIS | 0.839 | 0.840 | 0.000 |       |       |
| VIS2 <- TL  | 0.901 | 0.900 | 0.000 | 0.909 | 0.849 |
| VIS2 <- VIS | 0.961 | 0.961 | 0.000 |       |       |
| VIS3 <- VIS | 0.959 | 0.959 | 0.000 |       |       |
| VIS3 <- TL  | 0.894 | 0.894 | 0.000 |       |       |

According to Hair et al. (2011) and Hair et al. (2019), outer loadings must be greater than 0.60, while composite reliability (CR) and average variance extracted (AVE) must be greater than 0.70 and 0.50, respectively. Therefore, the preceding table shows that all constructions have attained a fair degree of dependability and convergence and that all indicators (items) have appropriate outer loadings.

Table 4: Discriminant validity

|       | CP    | CWP   | DA    | IC    | ICH   | ICOM  | IG    | IR    | IS    | IWB   | InHRD | InPPA | InPR  | InPRC | InPRR | OE    | PR    | SL    | TL    | TP    | VIS |  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|--|
| CP    |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| CWP   | 0.837 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| DA    | 0.506 | 0.559 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| IC    | 0.873 | 0.827 | 0.500 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| ICH   | 0.776 | 0.839 | 0.479 | 0.773 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| ICOM  | 0.688 | 0.731 | 0.403 | 0.786 | 0.623 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| IG    | 0.721 | 0.811 | 0.479 | 0.679 | 0.832 | 0.580 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| IR    | 0.817 | 0.863 | 0.524 | 0.879 | 0.821 | 0.814 | 0.701 |       |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| IS    | 0.553 | 0.519 | 0.275 | 0.592 | 0.514 | 0.820 | 0.523 | 0.499 |       |       |       |       |       |       |       |       |       |       |       |       |     |  |
| IWB   | 0.887 | 0.796 | 0.557 | 0.864 | 0.695 | 0.735 | 0.547 | 0.704 | 0.557 |       |       |       |       |       |       |       |       |       |       |       |     |  |
| InHRD | 0.870 | 0.874 | 0.486 | 0.890 | 0.714 | 0.684 | 0.591 | 0.708 | 0.435 | 0.821 |       |       |       |       |       |       |       |       |       |       |     |  |
| InPPA | 0.590 | 0.585 | 0.454 | 0.588 | 0.540 | 0.467 | 0.544 | 0.544 | 0.478 | 0.606 | 0.489 |       |       |       |       |       |       |       |       |       |     |  |
| InPR  | 0.873 | 0.882 | 0.485 | 0.898 | 0.724 | 0.688 | 0.602 | 0.773 | 0.451 | 0.829 | 0.837 | 0.500 |       |       |       |       |       |       |       |       |     |  |
| InPRC | 0.673 | 0.682 | 0.652 | 0.688 | 0.584 | 0.789 | 0.767 | 0.675 | 0.601 | 0.870 | 0.703 | 0.837 | 0.846 |       |       |       |       |       |       |       |     |  |
| InPRR | 0.588 | 0.549 | 0.394 | 0.560 | 0.546 | 0.501 | 0.487 | 0.583 | 0.325 | 0.599 | 0.488 | 0.772 | 0.490 | 0.859 |       |       |       |       |       |       |     |  |
| OE    | 0.547 | 0.665 | 0.426 | 0.570 | 0.494 | 0.389 | 0.626 | 0.575 | 0.377 | 0.778 | 0.487 | 0.464 | 0.495 | 0.713 | 0.412 |       |       |       |       |       |     |  |
| PR    | 0.879 | 0.570 | 0.487 | 0.690 | 0.828 | 0.887 | 0.713 | 0.685 | 0.689 | 0.807 | 0.801 | 0.554 | 0.631 | 0.505 | 0.582 | 0.645 |       |       |       |       |     |  |
| SL    | 0.766 | 0.665 | 0.516 | 0.509 | 0.859 | 0.986 | 0.694 | 0.885 | 0.677 | 0.870 | 0.742 | 0.576 | 0.798 | 0.651 | 0.599 | 0.599 | 0.697 |       |       |       |     |  |
| TL    | 0.844 | 0.884 | 0.453 | 0.881 | 0.740 | 0.862 | 0.659 | 0.519 | 0.814 | 0.873 | 0.831 | 0.545 | 0.840 | 0.899 | 0.531 | 0.536 | 0.526 | 0.544 |       |       |     |  |
| TP    | 0.593 | 0.806 | 0.518 | 0.748 | 0.806 | 0.751 | 0.688 | 0.689 | 0.509 | 0.527 | 0.604 | 0.539 | 0.703 | 0.627 | 0.565 | 0.511 | 0.531 | 0.598 | 0.895 |       |     |  |
| VIS   | 0.859 | 0.727 | 0.487 | 0.855 | 0.728 | 0.868 | 0.641 | 0.689 | 0.471 | 0.523 | 0.887 | 0.525 | 0.890 | 0.725 | 0.539 | 0.555 | 0.561 | 0.730 | 0.820 | 0.772 |     |  |

Table 4 demonstrates strong discriminant validity among the latent constructs, with all heterotrait correlation (HTMT) values above the diagonal significantly less than 1, aligning with Henseler et al. (2015) guidelines. The values consistently remain below 1, reinforcing the distinctiveness of these concepts. The study's empirical evidence affirms that these concepts effectively capture different facets of the underlying variables, further supported by the covariance matrix and correlation coefficients, consolidating the discriminant validity.

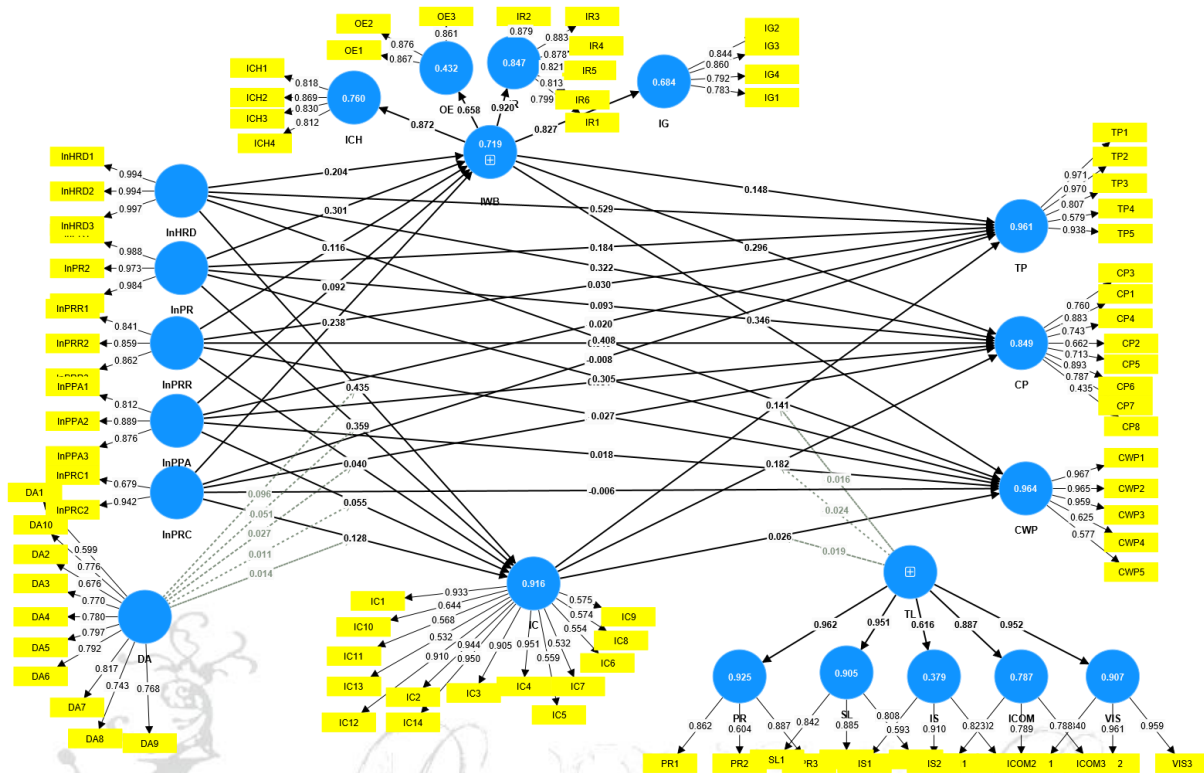


Figure 2: Path model with standardized factor loadings

**Predictive Power**

The model's explanatory power is measured by the endogenous construct(s)' coefficient of determination ( $R^2$ ), also known as in-sample predictive power (Rigdon, 2012). It represents the variance explained in each construct (Shmueli & Koppius, 2011). Higher  $R^2$  values suggest more explanation. Social scientific fields consider  $R^2$  values of 0.75, 0.50, and 0.25 significant, moderate, and weak (Hair, Ringle, & Sarstedt, 2011).

Table 5: R-square Analysis

|      | R-square | R-square adjusted |
|------|----------|-------------------|
| TP   | 0.615    | 0.603             |
| CP   | 0.749    | 0.845             |
| CWP  | 0.642    | 0.631             |
| IC   | 0.568    | 0.512             |
| IWB  | 0.719    | 0.714             |
| OE   | 0.432    | 0.430             |
| ICH  | 0.760    | 0.759             |
| IG   | 0.684    | 0.683             |
| IR   | 0.847    | 0.846             |
| IS   | 0.579    | 0.577             |
| ICOM | 0.787    | 0.786             |
| PR   | 0.583    | 0.583             |
| SL   | 0.745    | 0.782             |
| VIS  | 0.657    | 0.626             |

The R<sup>2</sup> values reveal the substantial influence of the chosen independent factors on each dependent variable. Task Performance is notably explained with a R<sup>2</sup> of 0.615, attributing 61.5% of employee performance variance to the model. CP, exhibiting an R-square of 0.749, clarifies 74.9% of variability in extra-role contributions. IWB is well-accounted for with an R<sup>2</sup> of 0.719, indicating 71.9% variance understanding. Innovation Capabilities, with an R<sup>2</sup> of 0.568, elucidates 56.8% of the variance, emphasizing variable importance in grasping firms' innovation capabilities. IWB is explained by 71.9% with an R-square of 0.719. Other variables, with R<sup>2</sup> values from 0.432 to 0.787, collectively contribute to understanding the relationship between independent variables and critical dimensions of employee performance and innovation constructs, showcasing the representation's robust explanatory power (Chin, 2010; Hair et al., 2017; Fornell & Larcker, 1981).

**Assessment of Structural Model**

The strength and direction of linear relationships between two or more variables are assessed using correlation analysis. This practice, outlined by Hinkle, Wiersma, and Jurs (2003), offers valuable insights into data patterns and trends, aiding researchers in comprehending the nature and magnitude of relationships between variables.

Table 6: Correlation Analysis

|       | CP    | CWP   | DA    | IC    | IWB   | InHRD | InPPA | InPR  | InPRC | InPRR | TL    | TP    |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| CP    | 1.000 | 0.802 | 0.479 | 0.892 | 0.455 | 0.590 | 0.504 | 0.687 | 0.765 | 0.502 | 0.729 | 0.719 |
| CWP   | 0.802 | 1.000 | 0.495 | 0.738 | 0.596 | 0.660 | 0.490 | 0.660 | 0.717 | 0.468 | 0.655 | 0.758 |
| DA    | 0.479 | 0.495 | 1.000 | 0.479 | 0.515 | 0.465 | 0.390 | 0.761 | 0.490 | 0.342 | 0.437 | 0.475 |
| IC    | 0.892 | 0.738 | 0.479 | 1.000 | 0.752 | 0.645 | 0.508 | 0.545 | 0.615 | 0.490 | 0.668 | 0.548 |
| IWB   | 0.855 | 0.696 | 0.515 | 0.852 | 1.000 | 0.815 | 0.530 | 0.517 | 0.725 | 0.529 | 0.656 | 0.556 |
| InHRD | 0.890 | 0.760 | 0.465 | 0.545 | 0.715 | 1.000 | 0.445 | 0.688 | 0.728 | 0.441 | 0.739 | 0.672 |
| InPPA | 0.504 | 0.490 | 0.390 | 0.508 | 0.530 | 0.445 | 1.000 | 0.451 | 0.580 | 0.629 | 0.483 | 0.466 |
| InPR  | 0.887 | 0.660 | 0.461 | 0.745 | 0.817 | 0.788 | 0.451 | 1.000 | 0.430 | 0.440 | 0.440 | 0.668 |
| InPRC | 0.865 | 0.717 | 0.490 | 0.615 | 0.625 | 0.728 | 0.580 | 0.730 | 1.000 | 0.553 | 0.519 | 0.720 |
| InPRR | 0.502 | 0.468 | 0.342 | 0.490 | 0.529 | 0.441 | 0.629 | 0.440 | 0.553 | 1.000 | 0.476 | 0.478 |
| TL    | 0.829 | 0.855 | 0.437 | 0.768 | 0.656 | 0.839 | 0.483 | 0.640 | 0.619 | 0.476 | 1.000 | 0.657 |
| TP    | 0.719 | 0.758 | 0.475 | 0.748 | 0.856 | 0.872 | 0.466 | 0.668 | 0.720 | 0.478 | 0.857 | 1.000 |

Table 6 presents a correlation matrix exploring relationships within our research framework. Notably, a strong positive correlation (0.802) between Contextual Performance and Counterproductive Work Conduct emphasizes the need for balanced personnel management. A moderate positive link (0.479) between Digital Adoption and Innovation Capabilities suggests technology investment stimulates innovation. A substantial positive association (0.656) between Innovative Work Behavior and Transformational Leadership indicates leadership inspiring innovation. A robust positive correlation (0.657) between Task Performance and Transformational Leadership showcases leadership's multifaceted impact on performance. Furthermore, a positive correlation (0.451) between Innovation in HR Practices and Performance Appraisal signifies the role of HR in organizational innovation (Jones & James, 1979; Bharadwaj et al., 2013; Bass & Riggio, 2006; Boxall & Purcell, 2008).

**The structural model (Inner Model)**

Sarstedt and Cheah (2019) highlight the Structural Model's utility in understanding complex variable relationships, operationalized through SmartPLS 3.2.3 (Ringle et al., 2015). Bootstrapping, a crucial phase in PLS-SEM, enhances estimate stability by generating sub-samples, and the t-values derived provide insight into the significance of path coefficients (Hair et al., 2017). Following Hair et al.'s (2016) approach, bootstrapping involves extracting numerous sub-samples with replacements. T-values larger than 1.96 (p < .005) indicate a 95% confidence level, revealing the significance of path coefficients in the structural

equation predictions ( $\alpha = 0.05$ ). The t-values illuminate whether the link between measurable and latent variables is significant, as represented in Figure 2.

Table 7: Direct Effect Analysis

| Structural Path | Estimate | T-Stats | P values |
|-----------------|----------|---------|----------|
| InHRD -> TP     | 0.529    | 5.292   | 0.000    |
| InHRD -> CP     | 0.322    | 2.683   | 0.002    |
| InHRD -> CWP    | 0.408    | 3.15    | 0.002    |
| InPR -> TP      | 0.184    | 2.122   | 0.004    |
| InPR -> CP      | 0.093    | 0.503   | 0.615    |
| InPR -> CWP     | 0.305    | 2.621   | 0.000    |
| InPRR -> TP     | 0.03     | 1.835   | 0.067    |
| InPRR -> CP     | 0.03     | 3.538   | 0.000    |
| InPRR -> CWP    | 0.027    | 6.013   | 0.000    |
| InPPA -> TP     | 0.075    | 4.952   | 0.000    |
| InPPA -> CP     | 0.031    | 5.967   | 0.000    |
| InPPA -> CWP    | 0.018    | 1.004   | 0.315    |
| InPRC -> TP     | 0.766    | 5.176   | 0.000    |
| InPRC -> CP     | 1.877    | 10.025  | 0.000    |
| InPRC -> CWP    | 0.598    | 3.342   | 0.004    |

The structural path analysis results, presented in Table 7, examine the causal relationships within the Pharmaceutical Industry of Pakistan. Innovative HR Development (InHRD) reveals a statistically significant positive impact ( $\beta=0.529$ ,  $t=5.292$ ,  $p<0.005$ ) on Task Performance (TP). Path 2 shows a significant positive influence ( $\beta=0.322$ ,  $t=2.683$ ,  $p<0.005$ ) of InHRD on Contextual Performance (CP). Path 3 indicates a significant negative association ( $\beta=0.408$ ,  $t=3.150$ ,  $p<0.005$ ) between InHRD and Counterproductive Work Behavior. Regarding Innovative Performance Appraisal (InPR), Path 4 supports a positive effect ( $\beta=0.184$ ,  $t=2.122$ ,  $p=0.004$ ) on TP, while path 5 reveals no significant impact on CP, and path 6 shows a positive impact ( $\beta=0.305$ ,  $t=2.621$ ,  $p>0.005$ ) on Counterproductive Work Behavior. For Innovative Redeployment-Retraining, InPRR->TP indicates no significant impact on TP and shows a positive effect ( $\beta=0.030$ ,  $t=3.538$ ,  $p<0.005$ ) on CP, and path InPRR to CWB reveals a positive impact ( $\beta=0.027$ ,  $t=6.013$ ,  $p<0.005$ ) on Counterproductive Work Behavior. Innovative Performance Appraisal (InPPA) has a significant positive impact ( $\beta=0.075$ ,  $t=4.952$ ,  $p<0.005$ ) on TP, and shows a positive influence ( $\beta=0.031$ ,  $t=5.967$ ,  $p<0.005$ ) on CP, while indicates no significant impact on Counterproductive Work Behavior. Finally, Innovative Reward and Compensation (InPRC) significantly positively influences TP ( $\beta=0.766$ ,  $t=5.176$ ,  $p<0.005$ ), and shows a strong positive impact ( $\beta=1.877$ ,  $t=10.025$ ,  $p=0.000$ ) on CP, and reveals a positive impact ( $\beta=0.598$ ,  $t=3.342$ ,  $p<0.005$ ) on Counterproductive Work Behavior.

Table 8: Indirect Effect Analysis

| Structural Path    | Estimate | T-Stats | P values |
|--------------------|----------|---------|----------|
| InHRD -> IC -> TP  | 0.061    | 2.092   | 0.000    |
| InHRD -> IC -> CP  | 0.079    | 1.775   | 0.076    |
| InHRD -> IC -> CWP | 0.011    | 0.585   | 0.559    |
| InPR -> IC -> TP   | 0.507    | 7.492   | 0.000    |
| InPR -> IC -> CP   | 0.652    | 5.525   | 0.000    |
| InPR -> IC -> CWP  | 0.009    | 0.559   | 0.576    |
| InPRR -> IC -> TP  | 0.006    | 1.19    | 0.234    |
| InPRR -> IC -> CP  | 0.733    | 7.324   | 0.000    |
| InPRR -> IC -> CWP | 0.001    | 0.483   | 0.629    |
| InPPA -> IC -> TP  | 0.777    | 4.577   | 0.000    |
| InPPA -> IC -> CP  | 0.1000   | 3.412   | 0.000    |
| InPPA -> IC -> CWP | 0.143    | 5.022   | 0.000    |

|                     |       |       |       |
|---------------------|-------|-------|-------|
| InPRC -> IC -> TP   | 0.809 | 5.435 | 0.000 |
| InPRC -> IC -> CP   | 0.023 | 3.026 | 0.000 |
| InPRC -> IC -> CWP  | 0.003 | 0.531 | 0.595 |
| InHRD -> IWB -> TP  | 0.030 | 0.945 | 0.345 |
| InHRD -> IWB -> CP  | 0.060 | 0.924 | 0.355 |
| InHRD -> IWB -> CWP | 0.071 | 9.711 | 0.001 |
| InPR -> IWB -> TP   | 0.045 | 3.617 | 0.000 |
| InPR -> IWB -> CP   | 0.089 | 7.800 | 0.000 |
| InPR -> IWB -> CWP  | 0.104 | 1.430 | 0.153 |
| InPRR -> IWB -> TP  | 0.017 | 2.408 | 0.000 |
| InPRR -> IWB -> CP  | 0.035 | 2.407 | 0.000 |
| InPRR -> IWB -> CWP | 0.040 | 2.691 | 0.007 |
| InPPA -> IWB -> TP  | 0.403 | 7.84  | 0.000 |
| InPPA -> IWB -> CP  | 0.738 | 6.307 | 0.003 |
| InPPA -> IWB -> CWP | 0.981 | 9.582 | 0.000 |
| InPRC -> IWB -> TP  | 0.035 | 1.977 | 0.048 |
| InPRC -> IWB -> CP  | 0.071 | 2.079 | 0.000 |
| InPRC -> IWB -> CWP | 0.082 | 2.164 | 0.003 |

Williams, Vandenberg, and Edwards (2009) advocate for maximizing intervention impact when both path a and path b are statistically significant. In mediation analysis, a third variable assesses the causal relationship between independent and dependent variables (Hair et al., 2016). Bootstrapping, suitable for small sample sizes and not reliant on data distribution, is employed for mediation analysis (Zhao, Lynch & Chen, 2010). Table 7 reveals mediation effects, unveiling complex pathways among Innovation in HR, Innovation Capabilities, Innovative Work Behaviour, and Employee Performance.

Innovation acts as a mediator between HR practices and employee performance, with HRD's innovative role positively influencing counterproductive work behavior ( $\beta = 0.071$ ,  $t = 9.711$ ,  $p < 0.005$ ). Moreover, Innovative Practices for Recruitment, Redeployment-Retraining, Performance Appraisal, and Reward & Compensation exhibit positive impressions on employee performance ( $t > 2$ ,  $p < 0.005$ ). However, employee innovation does not mediate the relationships between HRD and task performance, contextual performance, and redeployment-retraining practices ( $\beta = 0.030$ ,  $t = 0.945$ ,  $p > 0.005$ ).

Table 9: Moderation Analysis

| Structural Path  | Estimate | T-Stats | P values |
|------------------|----------|---------|----------|
| TL x IC -> TP    | 0.139    | 9.876   | 0.000    |
| TL x IC -> CP    | 0.048    | 4.003   | 0.000    |
| TL x IC -> CWP   | 0.019    | 1.604   | 0.109    |
| DA x InHRD -> IC | 0.367    | 56.341  | 0.000    |
| DA x InPR -> IC  | 0.354    | 6.730   | 0.000    |
| DA x InPRR -> IC | 0.042    | 8.288   | 0.000    |
| DA x InPPA -> IC | 0.004    | 4.387   | 0.001    |
| DA x InPRC -> IC | 0.135    | 4.166   | 0.000    |

Our structural model evaluation highlights critical moderation where Transformational Leadership significantly strengthens the relationship between Innovation Capabilities and Task Performance ( $\beta = 0.139$ ,  $t = 9.876$ ,  $p < 0.005$ ) and Contextual Performance ( $\beta = 0.048$ ,  $t = 4.003$ ,  $p < 0.005$ ). However, no significant moderation effect is observed on Counterproductive Work Behavior ( $\beta = 0.019$ ,  $t = 1.604$ ,  $p > 0.005$ ). Meanwhile, Digital Adoption significantly enhances the impact of HR practices on Innovation Capabilities, emphasizing its crucial role in fostering innovation within the industry.



## Discussion

### **Innovation in HR Practices does Influence Employee Performance Favourably**

Innovative HR practices positively impact employee performance, supported by Singh (2004), creating a favorable work environment. Thorough selection strategies, as advocated by Holzer (1987), elevate performance expectations and individual prominence. Using AI and competency-based interviews, improves selection, enhancing task and contextual performance while reducing counterproductive behavior. Innovative redeployment-retraining, incorporating virtual reality simulations, enhances employee skills and job satisfaction (Champathes, 2006) whereas effective training reduces the skills gap, elevating job satisfaction. Innovative performance appraisal, emphasizing justice and transparency, improves task and contextual performance, reducing counterproductive behavior (Zhong et al., 2016) that leads to employee motivation and retention.

### **Innovation capabilities mediates the positive effect of Innovative practices for Recruitment, Performance Appraisal and Reward & compensation on employee performance**

Innovation capabilities act as a mediator, channeling the positive effects of creative recruitment practices on task, contextual performance, and counterproductive behavior (Omerzel & Jordana, 2016; Bornay-Barrachina et al., 2012). Utilizing predictive analytics in recruitment helps identify innovative individuals, ultimately enhancing both innovation and task performance. Ethical hiring practices, emphasizing cultural fit, play a pivotal role in reducing counterproductive behavior. Innovative performance appraisal strategies, recognizing both contextual and task-related achievements, prove effective in minimizing unproductive conduct (DeNisi & Pritchard, 2006; Pulakos et al., 2015). Furthermore, innovation capabilities contribute significantly to shaping a pay structure that duly acknowledges both task and contextual performance, thereby fostering a positive work culture.

### **Innovation Capabilities adversely affect innovative - HRD, Redeployment-Retraining, and Employee Performance**

Overemphasizing novelty in HR development initiatives, without practical considerations, can lead to complexity and detachment from employees' daily needs (Amabile et al., 1996). Lack of alignment with organizational goals may diminish the perceived relevance of innovative HR practices, reducing motivation (Damanpour, 1991). An innovation-driven culture might cause resistance to change, hindering successful implementation. Innovation fatigue, due to constant emphasis without recognition, can lead to disengagement (Anderson & West, 1998). To address these, organizations should balance innovation with practicality, align initiatives strategically, manage change effectively, and provide recognition and support.

### **Digital Adoption has a positive influence and a moderating effect on the connection between Innovation in HR Practices and Innovation Capabilities**

Digital adoption is crucial in influencing and moderating the link between HR practices' innovation and innovation capabilities. Research consistently shows that digitizing HRM processes not only boosts efficiency but also significantly advances organizational innovation capabilities. D meijer (2017) highlights how digitalization streamlines HRM, allowing professionals to focus on more meaningful tasks. It can be deduced that improved efficiency in recruitment processes through digital HRM, while linking digital monitoring to enhanced motivation and innovation capabilities, fostering continuous improvement.



### **Transformational Leadership favorably moderates Innovation Capabilities on Task and Contextual performance while mitigating Counterproductive Work Behaviour**

Transformational leadership, known for instilling a shared corporate vision, moderates the relationship between innovative capabilities and task/contextual performance while minimizing counterproductive work behavior. Leaders engaging teams in organizational matters, as emphasized by Mencl et al. (2016), boost creativity and performance. Recognizing employees in decision-making enhances innovation and cultivates a collaborative culture. This alignment of transformational leadership, innovation capabilities, and performance, supported by Gozukara and Simsek (2015), drives organizational success through improved creativity, task/contextual performance, and reduced unproductive behavior.

### **Innovative Work Behaviour negatively mediates Innovative Role of HRD on Task Performance and Contextual Performance**

Innovative Work Behavior (IWB) serves as a negative mediator between the innovative role of HRD and Task and Contextual Performance, indicating potential issues in the innovation process. The focus on individual innovation might overshadow HRD's collaborative and strategic role, hindering its translation into improved task performance. Scott and Bruce (1994) found that overemphasizing individual projects without organizational integration hampers innovation management. Anderson et al. (2014) highlights the role of organizational support and leadership in fostering innovation, highlighting the importance of aligning individual creativity with organizational goals. If HRD lacks strategic efforts to transfer innovation into performance improvements, IWB may mediate negatively. Schein (2010) emphasizes the need for aligning corporate culture, highlighting the importance of HRD fostering continuous learning to avoid negative mediation.

### **Innovative Work Behaviour favorably mediates Innovation Practices for Recruitment Redeployment-Retraining, performance Appraisal, Reward and compensation on employee Performance**

The identification of three conceptually defined HR practices impacting Innovative Work Behavior (IWB) underscores the intricate link between HR practices and employee performance. A culture fostering IWB mediates the impact of Innovation Practices across dimensions (Shalley & Gilson, 2004). Innovative recruitment attracts creative candidates, enhancing task performance. Adaptability in organizational shifts improves contextual performance and reduces unproductive behavior. Retraining programs in innovative cultures boost performance through continual learning (Amabile et al., 1996). Innovation in performance appraisal criteria prioritizes creative problem-solving, influencing task and contextual performance. The link between IWB and Reward/Compensation emphasizes recognizing and compensating innovation, crucial for improved employee performance. The report highlights the delicate balance needed in training to maintain current skills without stifling creativity in biotechnology, showcasing how innovative HR practices enhance performance across various aspects.

## **Conclusion**

In conclusion, the study provides an in-depth comprehension of the multifaceted linkages that exist within the Pharmaceutical Industry of Pakistan. There has been a confirmation of the significance of innovation in human resources, innovation capabilities, innovative work behaviour, digital adoption, transformational leadership, and employee performance. All of these factors are intricately connected to one another, and the specific dynamics of the pharmaceutical industry play a noteworthy role in shaping the framework in which they exert their impact. The validation of hypotheses, in conjunction with the mediation and moderation effects that were discovered in the analysis, brings about an improvement in our comprehension of the ways in which HR practices, the use of technology, and leadership approaches collectively influence the outcomes of organisations operating within this sector.

## Future Research Recommendations

The study's conclusions open avenues for further research in critical areas. Future investigations could delve deeper into the processes through which specific HR practices influence innovation capacities and work behavior. Exploring the diverse impacts of human resource initiatives on innovation outcomes is essential. Furthermore, understanding the role of company culture in promoting HR-driven innovation and technology adoption is critical. Subsequent research could look into how cultural variables inside firms either impede or facilitate the successful adoption of HR innovations. Further research is needed to investigate the cultural and contextual elements that influence the effectiveness of transformational leadership in generating innovation. A thorough grasp of these elements can help to design more successful leadership development programs. Exploring the impact of these elements on other organizational outcomes, such as customer satisfaction, market performance, or competitive advantage, can offer businesses with useful information. Finally, the study provides a framework for further research into the complexities of innovation, human resource practices, technology adoption, leadership, and organizational performance. These findings are expected to help both academics and practitioners navigate the shifting landscape of the pharmaceutical industry and related sectors.

## Conflict of Interest

The authors state unequivocally that there are no current financial or personal conflicts of interest that could influence the results of this study. Furthermore, no money or payment of any type was obtained for carrying out this study or producing this report. Furthermore, we declare that we have no direct financial or personal links that could influence the findings or interpretations presented here.

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