

## TRANSFORMATIONAL LEADERSHIP, ARTIFICIAL INTELLIGENCE, AND EMPLOYEE OUTCOMES: A MEDIATION PERSPECTIVE

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### ABSTRACT

Modern workplaces have changed due to the quick integration of artificial intelligence (AI) into organizational procedures, which calls for leadership strategies that encourage staff adoption of AI-driven systems. This study uses AI acceptance as a mediating variable to investigate the impact of transformative leadership on employee engagement and quality of work life. Employees in the manufacturing and service sectors make up the study's population. Convenience sampling is a method for selecting a sample from the population. 511 employees make up the study's sample size. The findings demonstrated that transformative leadership has a favorable impact on AI adoption. The acceptance of AI has a favorable impact on employee engagement and work-life quality, according to the results. The relationship between transformative leadership, employee engagement, and quality of work life is further shown to be mediated by AI acceptance. Policymakers, HR specialists, and organizational executives in large-scale Pakistani businesses in the manufacturing, technology, and service sectors can all benefit from this research's insightful recommendations. The study highlights the significance of leadership development programs intended to improve employees' preparedness for technological change by emphasizing the role of transformational leadership in promoting AI acceptance.

**Keywords:** Transformational Leadership, AI Acceptance, Employee Engagement, Quality of Work Life

### 1. INTRODUCTION

Artificial intelligence (AI) refers to a collection of technologies that enable robots to perform jobs that typically require human intelligence (Arerkar, 2019; Tang et al., 2023). From complex deep learning structures to automated systems and robotics, the field of artificial intelligence (AI) has advanced since the late 1950s to offer a broad range of applications. Wang et al. (2025) predict that the global AI market would grow at a compound annual rate of 37.3% from 2023 and 2030, demonstrating its transformative impact

across industries (Li et al., 2019). A global survey found that in only one year, the percentage of businesses using AI rose from 55 to 78% (Alex et al., 2025). However, experts cannot agree on how AI will impact businesses. Some emphasize how it might increase effectiveness and efficiency (Pillai & Sivathanu, 2020; Tang et al., 2022). AI acceptance is the extent to which employees incorporate AI technology into their daily work to complete tasks intelligently (Tang et al., 2022). Writing or debugging code, writing prose, translating texts, and producing emails are some

common applications for ChatGPT. Because technologies have social characteristics (Liu et al., 2024) and users are crucial to realizing their potential (Potinteu et al., 2023; Liu et al., 2024; Tang et al., 2023; Shaikh et al., 2023; Wang et al., 2025), identifying the factors that influence AI acceptance has drawn scholarly and practical attention. More general environmental factors, including leadership, have not gotten enough attention, despite previous research focusing on human-level antecedents like personality, trust, and risk perceptions (Park & Woo, 2022; Potinteu et al., 2023). Leaders have a significant impact on society.

Businesses have swiftly adopted new technologies in the workplace over the last few decades, especially artificial intelligence, which has attracted increasing scientific interest. The risks AI poses to workers' well-being and the challenges in creating and deploying it have been the subject of numerous research (Mahi & Ghomari, 2025). Because they believe that the use of AI at work will either lead to the creation or improvement of new jobs or the loss of numerous job opportunities, these workers may feel frustrated and insecure about their jobs (He et al., 2023). Because of this, over two out of every five workers (38%) voiced concerns that AI may eventually automate or replace some or all of their job responsibilities (Lerner, 2023). The effects of AI on employee-related outcomes, such as employee engagement and quality of work life, have received little attention despite the expanding corpus of research on the factors that lead to its acceptance, especially in major manufacturing and service organizations.

Numerous issues with AI in an organizational setting have been noted in the body of current work. The majority of earlier research concentrated on organizational, social, psychological, and technological aspects that influence the adoption of AI. Leadership-driven mechanisms at the employee level received less attention (Dwivedi et al., 2023). Second, there is no empirical data on how transformational leadership influences workers' acceptance of AI in major manufacturing and service companies where workforce adaptation is crucial and AI

implementation is complicated (Wang et al., 2025). Third, the impact of AI adoption on employee-related outcomes, such as work-life balance and employee engagement, has received less attention than its adoption as an outcome variable (Schulz et al., 2025; Khan et al., 2024; Mahi & Ghomari, 2025; Nanjundeswaraswamy & Beloor, 2022; Salaheldin & Hussein, 2025). Lastly, with the growing integration of AI in large manufacturing and service organizations in Pakistan, a study for context-specific evidence is required.

Transformational leaders inspire their followers to prioritize the interests of the organization over their own by providing them with intellectual stimulation, inspiration, and vision (Bass, 1999; Reza, 2019). In order to promote the positive adoption of AI in digital transformation, transformational leadership can play a critical role. Because AI usually requires more work to grasp (Potinteu et al., 2023) and its use may go beyond formal function requirements, employees are likely to interpret leaders' opinions as indicators of organizational expectations. Since transformational leadership is value-free and its effects depend on the leader's strategic emphasis, this study restricts its scope to circumstances in which leaders have favorable opinions about the usage of AI. Positive sentiments on policy-aligned AI deployment put leaders in a better position to boost staff knowledge and engagement with these technologies (Shaikh et al., 2023). Executives with a positive attitude toward AI, in particular, are better able to articulate a compelling vision, provide constructive criticism, and set an example of appropriate behavior—all of which may boost employee engagement with AI. Additionally, this type of support could be seen as corporate backing, which would increase staff members' confidence in using new technologies, as leadership is often seen as the organization's spokesperson.

Employee engagement, a crucial element of organizational effectiveness, reflects workers' psychological and emotional dedication to their jobs (Rožman & Tominc, 2024). AI can boost employee engagement by automating repetitive tasks and creating more strategic roles, but its impact will depend on how well it is integrated

into procedures and how employees perceive it (Goswami et al., 2023). In Pakistan, where digital transformation is a national priority in Vision2030, a comprehensive national strategy with the aim of attaining sustainable development and improving the quality of life for all Pakistanis by the year 2030, examining the relationship between AI acceptance and employee engagement offers pertinent insights for policymakers and business leaders (Oxford Business Group, 2022). Quality of work-life (QWL) is now crucial to corporate performance since investments in human resources typically result in high levels of employee productivity and job satisfaction (Sabonete et al., 2021). Babamohamadi et al. (2023) define QWL as the extent to which employees are content with the demands of their jobs and workplace, both personal and professional. However, AI has an impact on workers' well-being (Iqbal, 2018). Understanding how AI impacts workers' QWL is crucial. In conclusion, through automation and knowledge augmentation, AI can increase productivity and enhance workers' quality of life (QWL) (Banaffa, 2023).

Additionally, Social Exchange Theory (SET) offers a theoretical framework for comprehending how employees react to the use of AI in work environments. According to SET theory, relationships at work are built on reciprocal exchanges, and employees react favorably when they believe that their leaders or organization is supportive, equitable, and invested in them (Blau, 1964; Cropanzano & Mitchell, 2005). According to this study, the primary social exchange mechanism is transformational leadership, which shows concern and support for staff members by providing them with intellectual stimulation, inspirational motivation, and personalized attention. Acceptance of AI acts as a mediator in this interaction, representing workers' emotional reactions to organizational investment and leadership backing. By improving workers' abilities and perceived organizational commitment, training and development further solidify this relationship by promoting reciprocity and trust. The adoption of AI in turn has a favorable impact on job satisfaction, employee engagement, and

quality of work life, illustrating how leaders and employees may encourage technology adoption and positive workplace outcomes through reciprocal social exchanges.

## 2. Literature Review

### 2.1 AI Acceptance

Research on the adoption of AI in organizational settings has expanded quickly as a result of the integration of intelligence systems into work processes. Various technology frameworks, including as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), have clarified how employee attitudes impact their readiness to embrace and use AI technology. According to Choi (2021), workers' intent to adopt AI tools in the service industry is greatly influenced by their motivation and aptitude. Employee acceptance and use of AI in enterprises are significantly influenced by perceived utility and trust. Venkatesh and Davis (2000) contended that in the context of technology, the usefulness and usability of technology are important antecedents of attitudes connected to acceptance. It is clear from additional study that leadership strategies and support are crucial for deploying and adopting AI in the early phases, when employees' adoption decisions are still being considered (Makarius et al., 2020).

### 2.2 Transformational Leadership and AI Acceptance

Transformational leadership, one of the most well-known leadership philosophies in the management literature, emphasizes emotions, beliefs, and values (Bass, 1999; Guerrero et al., 2017; Yukl, 2012). There is evidence that transformational leadership has a positive effect on employee attitudes and behaviors, including job performance (Bakker et al., 2023), innovative behavior (Jun and Lee, 2023), change management (Bagga et al., 2023), digital transformation (Philip, 2021), and well-being (Gaur, 2023). Nothing is known about how it affects workers' adoption of AI, despite this extensive research. To survive and prosper in the rapidly evolving AI era, organizations need to

adapt to unprecedented environmental changes (Mikalef et al., 2021). Opportunities and expectations for organizational change are created by the increasing use of AI technology, making it necessary to develop leaders who can successfully lead digital transformation efforts (Philip, 2021). Transformational leadership is a suitable fit in this scenario because it involves articulating a compelling vision, recognizing external demands, and creating flexible organizational solutions (Ghamrawi, 2013; Mikalef et al., 2021; Bagga et al., 2023). By raising employee engagement and awareness of technology (Shaikh et al., 2023) and fostering employees' ability to adopt technological resources like authorized AI tools and resources (Bagga et al., 2023; Jun & Lee, 2023), transformational leadership enhances the organization's capacity to integrate emerging technologies into its core practices.

It is important to keep in mind that AI serves as both a tool and a cooperative "fellow" in work environments (Tang et al., 2022; Wang et al., 2025). However, the actuality of such positions sometimes depends on how users respond to the usage of AI in the workplace. Prior research on employees' usage of AI has primarily focused on domain-specific contexts, such as public service (Geske & Leyer, 2022), healthcare (Mousavi et al., 2025), education (Abbas et al., 2024), and customer service (Xu et al., 2020). More recent studies have focused on individual-level characteristics, including perspectives on AI (Potinteu et al., 2023; Mousavi et al., 2025) and personality traits (Park & Woo, 2022). However, when it comes to influencing the adoption of AI, situational factors—especially leadership—remain little understood. In addition to modeling its application and providing positive feedback, transformational leadership articulates a compelling vision for AI. Such supportive efforts may encourage staff to use AI, as transformational leaders are often skilled at integrating new technology and perceptive to external dynamics (Bagga et al., 2023; Jun & Lee, 2023). Furthermore, by decreasing repetitive task loads and boosting data processing effectiveness, AI can enhance work performance (Tang et al., 2022). Employees under transformative leadership may

therefore be more inclined to use AI in their daily job. Furthermore, considering that effective AI usage requires significant learning, transformational leadership's emphasis on self-development and adaptation (Shriberg & Shriberg, 2011) may further help the acquisition of critical skills, hence promoting active AI acceptance (Potinteu et al., 2023). Drawing on the previously cited reasoning, we propose that transformational leadership enhances workers' acceptance of AI in the workplace, particularly when leaders have favorable views regarding policy-aligned AI deployment. The hypothesis is as follows:

H1: Transformational leadership positively affect AI acceptance

## 2.3 AI Acceptance and Employees Outcomes

### 2.3.1 AI and Employee Engagement

AI technology can boost employee engagement through coaching, monitoring, and rewards, according to published study. Due to the increasing participation of people who are very adept at using new technologies, the level of engagement in the modern workplace is generally high (Bag et al., 2021). Bolton et al. (2018) claim that by employing AI technologies, businesses may boost employee engagement and collaboration. Chatbots and virtual assistants, which leverage AI-driven technologies, have been demonstrated to increase employee engagement and enhance teamwork and communication (Chang et al., 2023). The employment of AI technology by staff members enhances company identification and transparency, which raises employee engagement (Larsson & Heintz, 2020). AI tools are especially helpful for forecasting and influencing user behavior. These technologies are designed to provide individualized feedback and development opportunities that boost employee engagement in addition to automating monotonous tasks. Capatina et al. (2020) claim that this in turn provides users with a variety of analytical abilities, including comprehension, decision-making, and even the generation of insight that could captivate a person. Furthermore, Bag et al. (2021) offered factual proof of how AI tools affect user engagement. AI's ability to assess worker

performance and provide instant feedback significantly increases employee engagement by fostering a sense of continuous improvement and achievement (Davenport & Kirby, 2016). Offering AI services can thereby boost employee engagement and their ability to respond to client demands in a complete, accurate, timely, and compassionate manner (Khan et al., 2024). As a result, we use these arguments to support the following hypothesis:

H2: AI acceptance positively affect employee engagement

### 2.3.2 AI and Quality of Work Life

Aspects that impact a quality of work life (QWL) include work-life balance, facilities provided, health and safety conditions, working conditions, leave benefits, and healthy living arrangements (Islam and Siengthai, 2009). Work-related stress, occupational stress, working conditions, and career and work satisfaction are the most crucial components of QWL (Almarshad, 2015). Work design, work context, and work environment are the work-related factors associated with the employee's QWL (Almalki et al. 2012). Srivastava et al. (2019) state that supervision, physical surroundings, pay and benefits, development and progress, involvement, integration at work, and social relevance are the essential elements of an employee's quality of life (QWL). Pay and benefits, job satisfaction, participative management, commitment to the company, growth and development, teamwork, attitude and perception, social integration, employee participation, welfare opportunities, safety and healthy environment, and rewards system are some of the QWL facilitators that affect the overall quality of work-life for workers in the apparel industry (Yadav et al., 2019).

The impact of technology on employees' lives at work has been the subject of numerous studies. According to the research by Kraut et al. (1989), technology has a major and inevitable impact on QWL. Technology's impact on the effectiveness and caliber of service agents' work-life balance was demonstrated to be just as significant as other important factors, underscoring its significance in affecting workers' quality of life. Technology

integration in the workplace should be carefully studied to ensure that it enhances rather than detracts from employees' job satisfaction and general well-being. In a different study, Akyol and Güler (2014) found a positive relationship between technology and work-life quality. Additionally, how employees view information technology has a positive effect on their quality of working life, depending on their ability to accept, adapt to, and incorporate it into decision-making processes. AI may be useful in addressing antecedents of employee engagement, including as communication, diversity and inclusion, and QWL. Work-life balance, equitable pay, safe working conditions, opportunities for personal growth and development, and the social significance of work-life can all enhance QWL. Using AI in employee engagement has several advantages, including increased productivity, better employee wellbeing, and decreased attrition rates. The use of AI can significantly affect how well workers develop and apply their human skills. Companies can create a more informed and tailored employee engagement strategy that will help employees develop their skills and perform better on the job, which will boost job satisfaction and engagement, by using AI to concentrate on employees' needs and requirements (Ramachandran et al., 2021). AI integration in the workplace recognizes each person's unique strengths and empowers them to develop their abilities in novel and pertinent ways. Organizations may create a workforce that is better equipped to fulfill the demands of modern society by utilizing AI to augment human capabilities rather than to replace them. Council, 2018.

H3: AI acceptance positively affect quality of work life

### 2.4 AI Acceptance as Mediator

Transformational leadership has a favorable impact on employees' attitudes toward technological change by increasing motivation, support, and shared values, all of which encourage the adoption of new technologies like artificial intelligence (Yumu, 2025). Acceptance of AI functions as a psychological mediator that helps convert the impact of leadership into outcomes

pertaining to employees. According to Alshammari & Al-Mamary (2025), Khan et al. (2025), and Wang et al. (2025), when workers embrace and utilize AI in their work, they recognize increased productivity and better job performance, which lead to higher job satisfaction, more employee engagement, and an improved quality of work life. Therefore, by emphasizing the importance of employee perception about tech-driven work environments, AI acceptance mediates the relationship between

transformational leadership and employee-related outcomes, such as job happiness, employee engagement, and quality of work life. Therefore, we put up the following theories.

H4: AI acceptance mediate relationship transformational leadership and employee engagement

H5: AI acceptance mediate relationship transformational leadership and quality of work life

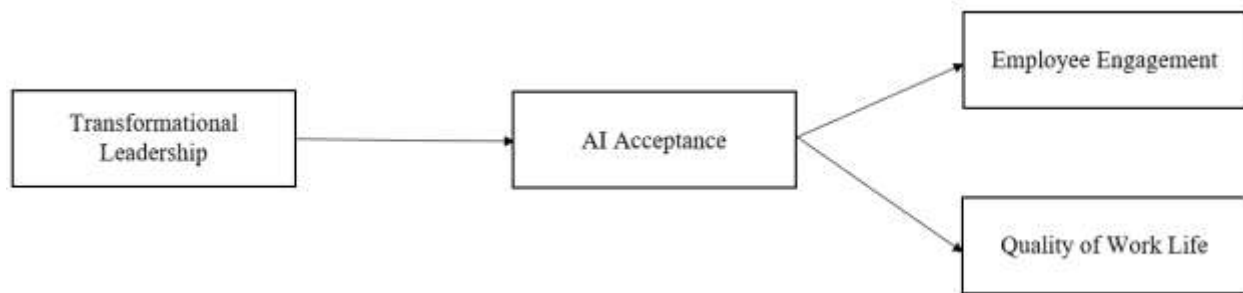


Figure 1. Theoretical Framework

### 3. Research Methodology

#### 3.1 Data Collection Procedure

Convenience sampling is a non-probability sample strategy used to gather data for this quantitative study (Attiq et al., 2023). This sample method is economical and aids in personnel targeting. Employees of numerous sizable manufacturing and service sector companies provided information on their level of involvement, job

satisfaction, and work-life balance. It created a URL to disseminate the completed survey. Data analysis took into account 511 forms in total.

#### 3.2 Demographic Profile

The respondents that participated in the data collection included both men and women from a range of age groups and educational backgrounds. Table 1 displays all the information:

Table 1: Demographic Statistics

Demographic	Category	Percentage (Frequency)
Gender	Male	63.2 (323)
	Female	36.80 (188)
Age (In years)	21-30 years	19.76 (101)
	31-40 years	36.99 (189)
	41-50 years	24.65 (126)
	Above 50 years	18.60 (95)
Education	Matriculation	7.04 (36)
	Intermediate	18.00 (92)
	Bachelors	37.38 (191)
	Masters	25.44 (130)
Experience	Above masters	12.14 (62)
	Less than 5 years	27.00 (138)
	5- 10 years	30.72 (157)

11-15 years  
Above 15 years

25.24 (129)  
17.04 (87)

### 3.3 Measures

A five-point Likert scale, where 1 denotes strongly disagree and 5 denotes strongly agree, was used to evaluate each measurement item. They modified the measurement items from previous studies. Bass and Avolio (1994) developed a five-item scale to measure transformational leadership. We use five items taken from Venkatesh and Davis (2000) to assess adoption of AI. To measure employee engagement, Schaufeli et al. (2002) provided 17 items. Lastly, Huang et al. (2007) provided twelve items to gauge the quality of work life.

### 3.4 Data Analysis Procedure

We employed PLS-SEM for the analysis. Partial least squares structural equation modeling (PLS-SEM) is a statistical method for simulating complex relationships between latent and observable variables (Purwanto & Sudargini, 2021). In this case, using PLS-SEM makes sense and is prudent. This study examines new or relatively understudied interactions in relation to employee job-related outcomes. PLS-SEM is the ideal choice for exploratory research when the theoretical model is being built or updated. This study employed PLS-SEM due to the multi-path complexity of the model, the predictive focus of the research, and the exploratory purpose of understanding the psychological aspects impacting sustainable food consumption behavior. Further supporting its employment were its small sample size and flexibility in dealing with non-normative

data. The two stages of PLS-SEM include analyzing the inner model (structural model) and examining the outside model (measurement model).

## 4. Results

### 4.1 Common Method Bias Test

In cross-sectional research, it is essential to examine common method bias (CMB). The greatest explained variance was 43.74%, which is less than the 50% criterion, per the Harman-Single Factor test results (Hair et al., 2017). These findings demonstrated that CMB is not seriously flawed.

### 4.2 Measurement Model

According to Cheah et al. (2018), the three crucial elements of the measurement model evaluation are discriminant validity, convergent validity, and reliability. The Dijkstra Henseler ( $\rho_A$ ), Cronbach's alpha ( $\alpha$ ), and composite reliability (CR) values are consistent because scores are greater than 0.70 (Hair et al., 2017). These results demonstrate that each variable is reliably and consistently measured. Furthermore, outer loading scores are higher than the recommended requirement, i.e., 0.60 (Hair et al., 2017), and average variance extracted (AVE) values exceed the recommended threshold, i.e.,  $> 0.50$ , which verifies the convergent validity (Fornell & Larcker, 1981). Using convergent validity values, all constructs are related and share a reasonable degree of variance (see Table 2).

**Table 2: Reliability and Validity Analysis**

Construct	Dimensions	Code	Loadings > 0.60	Alpha > 0.70	CR > 0.70	AVE > 0.50
Transformational Leadership Bass and Avolio (1994)		TL_1	0.773	0.877	0.911	0.671
		TL_2	0.848			
		TL_3	0.845			
		TL_4	0.831			
		TL_5	0.796			
AI Acceptance Venkatesh and Davis (2000)		AI_1	0.797	0.852	0.894	0.628
		AI_2	0.821			
		AI_3	0.794			
		AI_4	0.794			
		AI_5	0.755			
Employee Engagement Schaufeli et al. (2002)	Vigor	EE_V1	0.726	0.932	0.940	0.535
		EE_V2	0.784			
		EE_V3	0.820			
		EE_V4	0.735			
		EE_V5	0.758			
		EE_V6	0.755			
	Dedication	EE_D1	0.670	0.816	0.872	0.578
		EE_D2	0.806			
		EE_D3	0.784			
		EE_D4	0.766			
		EE_D5	0.768			
	Absorption	EE_A1	0.777	0.845	0.885	0.563
		EE_A2	0.747			
		EE_A3	0.751			
		EE_A4	0.798			
		EE_A5	0.711			
		EE_A6	0.715			
		Quality of Work Life Huang et al. (2007)	Work Life Balance			
QL_W2	0.874					
QL_W3	0.861					
Job Characteristics	QL_J1		0.833	0.768	0.866	0.683
	QL_J2		0.796			
	QL_J3		0.849			
Supervisory Behavior	QL_S1		0.841	0.773	0.869	0.688
	QL_S2		0.808			
	QL_S3		0.839			
Compensation and Benefits	QL_C1		0.848	0.804	0.884	0.718
	QL_C2		0.860			
	QL_C3		0.835			

Note: Alpha- Cronbach Alpha, CR- Composite Reliability, AVE- Average Variance Extracted

The study assesses discriminant validity using the heterotrait-monotrait (HTMT) ratio. Notably, every variable under study (Table 3) consistently maintains values below 0.90, suggesting strong discriminant validity (Kline, 2023).

**Table 3: HTMT Validity Analysis**

Variables	TL	AI	EE	QL
Transformational Leadership (TL)				
AI Acceptance (AI)	0.890			
Employee Engagement (EE)	0.754	0.810		
Quality of Work Life (QL)	0.798	0.887	0.836	

### 4.3 Structural Model

The structural model uses the five-step process after assessing the measurement model to confirm its validity and reliability. The collinearity problem is addressed by evaluating the variance inflation factor (VIF). Table 4 shows that the VIF values are still much below 5 (Hair et al., 2017).

We conclude from this result that there are no multicollinearity issues with the model. We then assess the hypothesis results using 5000 resamples and the bootstrapping technique. Table 4 shows that transformational leadership (H1:  $\beta = 0.77$ ,  $p < 0.00$ ) has a positive impact on AI

acceptance. This means that employees are more inclined to embrace and use AI when leaders exhibit significant transformational behavior in their firms. AI adoption has a favorable impact on employee engagement (H2:  $\beta = 0.72$ ,  $p < 0.00$ ), meaning that workers who embrace AI are typically more engaged at work. AI acceptance (H3:  $\beta = 0.79$ ,  $p < 0.00$ ) has a favorable impact on work life quality; this indicates that people who are receptive to AI typically have higher work life quality (also see Figure 2). According to Table 4, the R<sup>2</sup> for each predictor in AI adoption, employee engagement, and work-life quality is 59%, 52%, and 62%, respectively.

**Table 4: Structural Model Evaluation**

Hyp.	Path	Beta	t value	p-value	R <sup>2</sup>	VIF	f <sup>2</sup>	Q <sup>2</sup>
H1	Transformational Leadership → AI Acceptance	0.77	33.41	0.00	0.59	1.00	1.46	0.36
H2	AI Acceptance → Employee Engagement	0.72	27.11	0.00	0.52	1.00	1.10	0.24
H3	AI Acceptance → Quality of Work Life	0.79	30.90	0.00	0.62	1.00	1.67	0.35
Mediation Analysis					LCL (5%)	UCL (95%)		
		Beta	t value	p-value				
H4	Transformational Leadership → AI Acceptance → Employee Engagement	0.55	19.08	0.00	0.51	0.60		
H5	Transformational Leadership → AI Acceptance → Quality of Work Life	0.61	20.97	0.00	0.56	0.65		

VIF- Variance Inflation Factor, LCL- Lower Confidence Limit, UCL- Upper Confidence Limit

The effect size (f<sup>2</sup>) was then calculated to ascertain each pathway's relative significance (Sullivan & Feinn, 2012). One can categorize effect sizes into three groups: tiny (0.02), medium (0.15), and large (0.35). Table 4 displays the effect size (f<sup>2</sup>) data. A blindfolding method is used to assess the model's

predictive significance (Q<sup>2</sup>). Hair et al. (2017) state that the endogenous constructs have Q<sup>2</sup> values between 0.24 and 0.36, which are more than zero. This implies that the model is capable of making predictions.

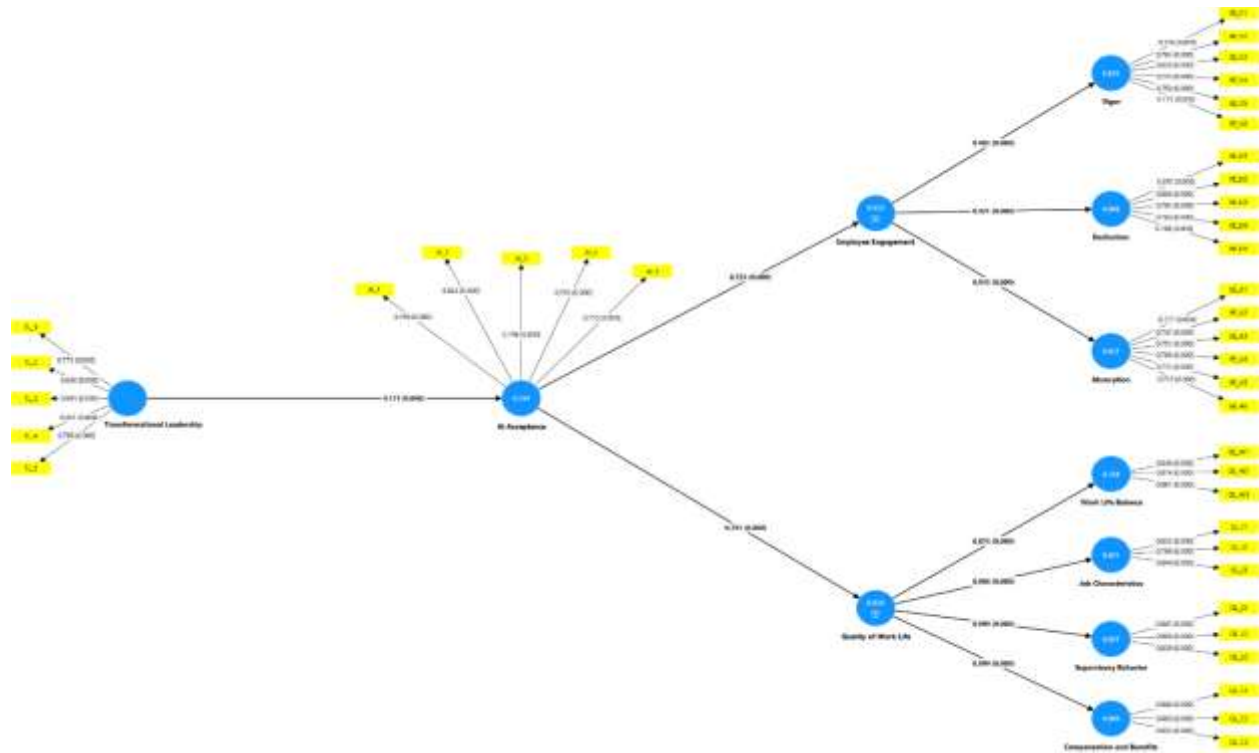


Figure 2: Structural Model

#### 4.4 Mediation Analysis

Mediation analysis is used to examine the indirect impact of AI adoption (see Table 4). The connection between transformational leadership and employee engagement is mediated by AI acceptance (H4:  $\beta = 0.55$ ,  $p < 0.00$ ; LCL = 0.51, UCL = 0.60). This indicates that transformational leadership increases employees' acceptance of AI, which improves their engagement at work. The connection between transformational leadership and quality of work life is mediated by AI acceptance (H5:  $\beta = 0.61$ ,  $p < 0.00$ ; LCL = 0.56, UCL = 0.65); this indicates that transformational leadership increases employee acceptance of AI, which improves employees' quality of work life.

#### 5 Discussion

The acceptability of AI was thought to be positively impacted by transformational leadership. The findings of hypothesis 1 demonstrated that transformational leadership has a favorable and significant impact on workers' acceptance of AI in Pakistan's manufacturing and service sectors. These results are consistent with

earlier studies (Agarwal & Prasad, 1998; Dwivedi et al., 2021) that indicated transformative leaders had a major influence on how employees view technology advancements.

According to hypothesis 2, the results show that acceptance of AI has a favorable and considerable impact on employee engagement at work. This indicates that AI contributes to increased worker engagement. Because of digitalization, our work is always evolving (Meyer et al. 2022; Parker and Grote 2022), and it is typically still technology-centered—that is, driven by technological improvements rather than the needs of human workers.

The study's findings also showed that AI acceptance mediates the connection between transformational leadership, employee engagement, and work-life quality (H4 and H5). It implies that the impact of transformational leadership helps employees perceive and embrace AI, which in turn affects their job satisfaction and quality of life at work. According to Bass and Riggio (2006), transformational leaders are those

who inspire, support, and encourage their colleagues, create a work atmosphere where staff members can work with confidence, and implement new technology like artificial intelligence. Employees become more at ease, embrace organizational change, and accept AI as a helpful tool rather than a source of worry when leaders demonstrate their value and trust in them (Dwivedi et al., 2021).

### 5.1 Implications

This paper provides some theoretical insights. First of all, it gives a clear picture of how AI may help with work engagement in organizational settings. These findings support the fundamental premise of SET, which holds that positive connections between employees and organizations are advantageous to employees. The results show that by enabling effective communication between organizational actors and providing accurate and timely information, AI applications in organizational contexts have a positive effect on work engagement. This outcome aligns with the SET ternate, which asserts that organizational resources and support (such the use of AI in the workplace) reciprocate beneficial employee actions. Therefore, our study broadens and unites the theoretical underpinnings of SET with modern technology by actually demonstrating that AI facilitates mutually beneficial interactions.

### 5.2 Limitations and Future Recommendations

This study has limitations even though it offers insightful information about how transformational leadership affects AI adoption and how it affects employee engagement and work-life balance. First, the study's cross-sectional design limits the capacity to determine the causal linkages between variables. Future research could use an experimental or longitudinal methodology to look at how these interactions change as AI technology advance inside businesses. Second, the study's emphasis on big businesses in Pakistan's industrial, technology, and service sectors restricts the applicability of its conclusions to small and medium-sized businesses (SMEs) or institutions functioning in other cultural and economic environments. To confirm the robustness of this

model, researchers could expand it to include cross-country or multi-sectoral comparisons. Third, social desirability effects or common method bias could affect data gathered from self-reported questionnaires. To improve validity, future studies should take into account multi-source data, such as supervisor ratings or objective performance metrics. In addition, although training and development is considered a moderator, other contextual elements like corporate culture, technological preparedness, or leadership support for innovation may also have an impact on the adoption of AI and its results. Investigating these factors may improve theoretical comprehension. Last but not least, qualitative methods like case studies and interviews may reveal more in-depth information about how employees interpret and react to the use of AI.

### 5.3 Conclusion

According to the study's findings, transformational leadership is crucial in influencing workers' acceptance of artificial intelligence (AI) and improving important workplace outcomes including worker engagement and quality of work life. Positive work environments that encourage receptivity to AI technologies are created by leaders that motivate, encourage, and support their staff. The results also imply that the adoption of AI serves as a key mediating factor in the ways that transformational leadership affects workers' attitudes and experiences at work. These observations highlight the significance of workforce preparedness and leadership in managing AI-driven organizational transformation in the context of Pakistan's manufacturing, technology, and service industries. Businesses that make leadership development investments stand a better chance of reaping the rewards of adopting AI. Overall, by combining human-centric and technological viewpoints, the study adds to the body of knowledge on leadership and technology management, providing both theoretical enhancement and useful advice for creating a workforce that is more engaged and adaptable in the age of digital transformation.

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