



**DRIVING OPERATIONAL EXCELLENCE IN AVIATION ORGANIZATIONS THROUGH
ENTREPRENEURIAL AND INTRAPRENEURIAL ORIENTATION**

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Abstract

Organizations in the aviation industry are required to maintain safety and control over services and operations while adapting to changing service requirements and recurring process issues. The focus of this study is to examine the relationship between Entrepreneurial Orientation and Intrapreneurial Orientation on Innovation-Driven Operational Excellence of operational employees at Allama Iqbal International Airport, Lahore. It also provides empirical evidence of the roles of Employee Engagement as a mediator and Perceived Organizational Support as a moderator between Employee Engagement and operational excellence. This study adopted a positivist approach, deductive methods, and a quantitative cross-sectional design. The data were collected using purposive sampling and a non-probability sampling method to select employees with relevant aviation operational experience. Smart-PLS 4 was used to assess measurement and structural models. Employee Engagement and operational excellence were significantly affected by Entrepreneurial Orientation. Intrapreneurial Orientation had a significant effect on Employee Engagement but had no significant direct effect on Operational Excellence. Employee Engagement played a key role in explaining operational excellence and in mediating both orientations. The interaction effect of Perceived Organizational Support (POS) and Employee Engagement (EE) on Innovation-Driven Operational Excellence was not significant; therefore, the moderation hypothesis was not supported. The results indicate that high-quality entrepreneurial leadership and employee participation play a significant role in improving operations. The results further indicate that IO contributed to IDOE indirectly through EE.

Keywords: Entrepreneurial Orientation, Intrapreneurial Orientation, Employee Engagement, Perceived Organizational Support, Innovation-Driven Operational Excellence

1. Introduction

1.1 Background of the Study

The aviation sector operates in a complex and rapidly changing global environment. Airlines, airports, ground handling companies, and other service providers face strict safety requirements, intense competition within the Aviation industry, passenger expectations, and ongoing cost pressures. Operational success therefore depends on more than meeting minimum operational standards. Aviation organizations must effectively utilize human resources, information technology, and facilities while maintaining reliable services.



In this context, operational excellence refers to timely processes, efficient resource usage, reliable service delivery in compliance with operational standards, and continuous improvement (W. Zhou, 2024).

The traditional aspects of efficient aviation are cost reduction, schedule optimization, fuel usage, standardization, and waste control. These factors still occupy an important place but are no longer enough. Employees must identify operational problems and respond effectively to technological developments, changing service expectations, process disruptions, and coordination across organizations. Entrepreneurial Orientation reflects an organization's tendency to support innovation, proactive behaviour, and calculated risk-taking. Intrapreneurial Orientation reflects an employee's willingness to take initiative and contribute ideas within the organization. Employee Engagement may connect these orientations with operational outcomes because engaged employees apply greater focus, energy, and persistence to their work. Perceived Organizational Support may determine whether Employee Engagement leads to stronger operational outcomes. This study combines these factors to examine how aviation organizations can achieve innovation-driven Operational Excellence without weakening operational discipline. (Saeed AlShamsi, Bin Ahmad, & Jasimuddin, 2023)

In this study, Innovation-Driven Operational Excellence refers to operational improvement achieved through innovation, continuous learning, and effective process management. The concept does not focus solely on innovation. A new practice is useful when it improves reliability, service quality, resource use, coordination, or other relevant operational outcomes. In aviation, proposed operational changes must be evaluated carefully before implementation. An idea that improves one aviation activity may create problems in other operational areas if its effects on other departments are not considered. IDOE therefore combines innovation with operational control to improve service reliability, coordination, efficiency, and resource use. There are many interrelated activities at the airport, and process disruptions in one area could affect passengers, baggage, aircraft turnaround, and subsequent flights. Operational employees directly observe delays and communication failures. The extent to which employees align with the organization's priorities and concerns can determine whether a new procedure becomes an established operational practice. Therefore, the study does not examine EO and IO only as abstract strategic concepts. It also considers whether they are linked to the concept of Employee Engagement and whether there is a relationship between Employee Engagement and operational excellence. (Oreschko, Schultz, & Fricke, 2011)

1.2 Problem Statement

Aviation organizations make substantial investments in technology, infrastructure, operational systems, and employee training. Despite these investments, organizations may continue to experience delays, coordination failures, inefficient resource use, limited employee involvement, and limited process improvement. In aviation, formal procedures and hierarchical control are vital as they ensure safety and consistency, a requirement that cannot be overlooked. However, in a workplace where decision-making is highly centralized, staff members may be reluctant to report recurring problems or propose operational improvement. The real challenge now is to integrate operational control with responsible innovation and meaningful employee involvement. This issue is particularly important for frontline and operational employees because they directly experience service failures, communication gaps, and process delays. (Morandini, Fraboni, Hall, Quintana-Amate, & Pietrantonio, 2025)

Some previous studies have focused on entrepreneurial attitudes, employee initiative, employee engagement, innovation, and operational performance. However, these factors are often examined separately or in settings that differ from daily aviation operations in Pakistan. Limited evidence is available regarding how Entrepreneurial Orientation and Intrapreneurial Orientation relate to Employee Engagement and Innovation-Driven Operational Excellence among operational employees at Allama Iqbal International Airport, Lahore. It is also unknown whether the relationships among Innovation-Driven Operational Excellence, Employee Engagement, and Perceived Organizational Support will be strengthened or weakened, and whether Employee Engagement will translate into Innovation-Driven Operational Excellence. This gap is significant because managers must understand that there is an operational response resulting from strategic direction, employee initiative, and organizational support. Therefore, the study tests the proposed direct,



mediating, and moderating relationships without assuming that every relationship is statistically significant. Specific regulations and hierarchical structures govern the aviation sector in Lahore, but alongside these frameworks, there are evolving passenger demands and operational pressures. Managers need information on the organizational factors that correlate with increased employee involvement and improvement. An organization may introduce suggestion programs, training, or employee support initiatives without knowing whether these practices contribute to engagement and operational improvement. The present model focuses on overcoming this issue; it separates the direct effects from mediation through EE and moderation by POS by independently testing each proposed relationship and reporting unsupported expectations.

1.3 Research Questions

There are eight research questions for this study. The questions examine five direct relationships, two mediation relationships, and one moderation relationship among EO, IO, EE, POS, and IDOE.

RQ1: What is the effect of Entrepreneurial Orientation on Innovation-Driven Operational Excellence?

RQ2: What is the effect of Intrapreneurial Orientation on Innovation-Driven Operational Excellence?

RQ3: What is the effect of Entrepreneurial Orientation on Employee Engagement?

RQ4: What is the effect of Intrapreneurial Orientation on Employee Engagement?

RQ5: What is the effect of Employee Engagement on Innovation-Driven Operational Excellence?

RQ6: Does Employee Engagement mediate the relationship between Entrepreneurial Orientation and Innovation-Driven Operational Excellence?

RQ7: Does Employee Engagement mediate the relationship between Intrapreneurial Orientation and Innovation-Driven Operational Excellence?

RQ8: Does Perceived Organizational Support moderate the relationship between Employee Engagement and Innovation-Driven Operational Excellence?

1.4 Research Objectives

The main objective of this study is to examine how Entrepreneurial Orientation and Intrapreneurial Orientation contribute to Innovation-Driven Operational Excellence in aviation organizations. The study also examines Employee Engagement as the response mechanism linking the two orientations to IDOE and tests Perceived Organizational Support as a moderator of the relationship between EE and IDOE. The objectives follow the same order as the research questions and hypotheses.

1. To examine the effect of Entrepreneurial Orientation on Innovation-Driven Operational Excellence.
2. To examine the effect of Intrapreneurial Orientation on Innovation-Driven Operational Excellence.
3. To examine the effect of Entrepreneurial Orientation on Employee Engagement.
4. To examine the effect of Intrapreneurial Orientation on Employee Engagement.
5. To examine the effect of Employee Engagement on Innovation-Driven Operational Excellence.
6. To examine the mediating role of Employee Engagement in the relationship between Entrepreneurial Orientation and Innovation-Driven Operational Excellence.
7. To examine the mediating role of Employee Engagement in the relationship between Intrapreneurial Orientation and Innovation-Driven Operational Excellence.
8. To examine the moderating role of Perceived Organizational Support in the relationship between Employee Engagement and Innovation-Driven Operational Excellence.

1.5 Research Scope

Allama Iqbal International Airport, Lahore, was selected as the sample for this study. The participants were working in airline operations, airport operations, ground handling, maintenance, and other related aviation departments. The study measured employees' perceptions of EO, IO, EE, POS, and IDOE. External factors such as fuel cost, weather conditions, geopolitical events, or changes in national regulations were outside the scope of the study.

Only organizational and employee-related factors were included in the scope. Technical aspects of aircraft performance, airport capacity, national policy, and macroeconomic conditions were not measured in the study. The study did not assess airport performance through independent operational records; instead, it examined employees' perception of organizational practices and operational improvement. It instead analyzed



whether there was a relationship between employees' perceptions of enhanced entrepreneurial direction, intrapreneurial opportunity, and innovation, and their support for higher levels of innovation-driven operational excellence. This boundary helps keep the research question manageable and aligns with the conclusions drawn from the data collected through the questionnaire.

2. Literature Review

The proposed relationships are organized based on the Stimulus-Response-Outcome model. Entrepreneurial Orientation and Intrapreneurial Orientation are organized as stimuli, which are cues for how the organization deals with innovation and employee initiative. Employee Engagement is what is created when employees respond; it is their energy, involvement, and commitment to work. Innovation-Driven Operational Excellence is the result. Positive Perceived Organizational Support is placed in the middle as a moderator of EE and IDOE. The framework does not assume that support will improve the relationship. Instead, it proposes testing whether the relationship improves. (Sarılğan, Şahap, Bakır, & Süleç, 2022)

Organizational performance is no longer determined solely by operational systems, technology, and infrastructure. Employees' behaviour also influences organizational and operational outcomes. The aviation industry operates in a complex and dynamic environment in which employees' actions, decisions, and participation influence operational efficiency, service, and reliability. To understand differences in performance, it is therefore important to know how organizational characteristics affect employees' responses to organizational conditions. The SRO framework provides a general description of this, conceptualizing organizational functioning as a series of behaviours that interact with employees' psychological and behavioural responses to organizational events or stimuli, leading to organizational outcomes. The stimuli in the workplace include managerial practices, leadership styles, and policies that convey expectations and priorities to workers. The stimuli shape employees' perceptions and understanding of their work, as well as the effort they devote to their responsibilities. (Saeed AlShamsi et al., 2023)

Employees respond to their work through their thoughts, feelings, and actions. They may take initiative, suggest practical ideas, and contribute beyond their basic job responsibilities. However, some employees may perform only the tasks required by their roles. These different responses can affect operational efficiency, innovation, service quality, and the use of organizational resources. Entrepreneurial Orientation (EO) and Intrapreneurial Orientation (IO) are two organizational stimuli that are proposed in this context. EO is at the organizational level and represents a direction of corporate activity based on innovation, risk-taking, and being proactive. In contrast, IO operates at the employee level and reflects employees' willingness to identify operational problems, propose solutions, experiment with responsible improvement, and take initiative within the organization. They are supposed to be independent, experiment, and innovate from within, acting as entrepreneurs by taking initiative. These orientations and others give rise to an organization's climate, which affects employee attitudes and activities (Bessant & Tidd, 2007).

2.1 Entrepreneurial Orientation and Innovation-Driven Operational Excellence

Entrepreneurial Orientation (EO) describes an organization's strategic proclivity toward innovativeness, proactiveness, and risk-taking. A high EO organization is always looking to see what is out there, chooses the innovative route to solve problems, and is proactive rather than reactive in its approach to the environment. Through entrepreneurial practice, the enterprise can adopt advanced technology, optimize aviation operations, provide better service, and improve its adaptability in the aviation industry. (L. Zhou, Wang, Jiang, & Zhang, 2026). Studies reveal that, from the perspective of Stimulus – Response – Outcome (SRO) theory, EO, as an organizational stimulus, could elicit an innovative process among employees, mediated by innovative thinking. Openness to new opportunities and innovative processes has contributed to improved organizational performance and innovation capacity in organizations with a high entrepreneurial orientation, as demonstrated by previous studies. Moreover, in the aviation industry, entrepreneurship can drive improvements in operational excellence, including innovations in flight scheduling, passenger handling, safety management, aircraft maintenance, and resource utilization. As a result, an organization with more entrepreneurial orientation is likely to achieve greater levels of innovation-driven operational excellence. (Sylva, 2020)



H1: Entrepreneurial Orientation positively influences Innovation-Driven Operational Excellence.

2.2 Intrapreneurial Orientation and Innovation-Driven Operational Excellence

Intrapreneurial Orientation (IO): How willing employees are to share ideas, try new solutions, and engage in organization development efforts. IO differs from EO, which operates at the organizational level; IO encourages employees to be entrepreneurial within the organization. IO under SRO stimulates an environment conducive to creativity, autonomy, and innovation. Employee knowledge is critical to the efficiency and day-to-day operations of aviation organizations, and so are their line-of-business decisions. Heads of ground handling, passenger service, maintenance, and airport operations may have important insights to enhance these functions. Research indicates that workplace environments that foster intrapreneurial activity are associated with higher levels of innovation, improved process efficiency, and better organizational performance. When employers engage employees in thinking and decision-making, they are more likely to identify inefficiencies in the workplace and develop inventive solutions. (Charoensak, Chamroonkul, Payon, & Sakulkrit, 2025) argued that the intrapreneurial orientation would positively affect operational excellence in the aspect of innovation.

H2: Intrapreneurial Orientation positively influences Innovation-Driven Operational Excellence.

2.3 Entrepreneurial Orientation and Employee Engagement

Employee engagement is the emotional, cognitive, and behavioural commitment to the job and company. Employees are enthusiastic and committed and do above and beyond their job requirements. In the context of SRO, entrepreneurial orientation has been shown to serve as an organizational stimulus influencing employees' attitudes and behaviours. Innovative, entrepreneurial, and proactive actions by organizations indicate a dynamic workspace as perceived by employees. These can boost employee motivation, involvement, and psychological ownership. Research to date suggests that an entrepreneurial organizational culture positively affects employee engagement by increasing employees' feelings of being valued, trusted, and motivated to help the organization succeed. In aviation-related organizations, entrepreneurial practices can boost employees' enthusiasm and support operational improvement initiatives, thereby improving employee engagement. (Christopher, Aizpú, & Jurado, 2025)

H3: Entrepreneurial Orientation positively influences Employee Engagement.

2.4 Intrapreneurial Orientation and Employee Engagement

An intrapreneurial orientation offers employees several opportunities to engage in problem-solving, decision-making, and innovation. This enables them to feel a sense of ownership and control over their job, fostering responsibility in the workplace. In the SRO framework, Intrapreneurial Orientation serves as an organizational stimulus that encourages positive psychological responses among employees. Employees are more likely to develop an emotional connection to organizational goals when managers value and support their ideas and efforts. (Kim, Kim, Park, & Lee, 2025)

There is a consistent link between everyday practices, such as freedom to make decisions, participation, and innovation-supportive environments, and higher levels of employee engagement. Aviation employees who have the authority to contribute innovative ideas are more likely to exhibit commitment, enthusiasm, and dedication toward the organization's objectives. Therefore, it is expected that the orientation towards intrapreneurs will increase employee involvement. (Vo & Hoang, 2026)

H4: Intrapreneurial Orientation positively influences Employee Engagement.

2.5 Employee Engagement and Innovation-Driven Operational Excellence

Employee engagement measures the response aspect of the SRO Model. Involved workers are more energetic, devoted, and active in organizational activities. They are willing to contribute discretionary effort, collaborate with others, and participate in ongoing improvement efforts. Operational excellence is crucial in aviation organizations, as the quality of service, how reliably services are performed, related safety issues, and process efficiency depend largely on employee conduct. A favourable attitude among employees is positively correlated with the ability to identify problems in their company, propose innovative solutions, and actively participate in efforts to improve performance. Previous studies have found a strong positive correlation between employee engagement and organizational performance, innovation, productivity, and



effectiveness. Innovation-based operational excellence will be better achieved in an environment of higher employee engagement. (Süzen, 2025)

H5: Employee Engagement positively influences Innovation-Driven Operational Excellence.

2.6 Mediating Role of Employee Engagement between EO and IDOE

The SRO framework proposes that organizational stimuli are the mechanism that affects outcomes with employees' reactions. Naturally, entrepreneurial orientation does not produce the desired effect on innovation in the aviation industry without employees' continued involvement and positive response to organizational guidance and support. Employee engagement is a behavioural pathway through which entrepreneurial orientation leads to operational measures. When employees become more engaged, they are more likely to engage in innovation activities and improve operations. The role of employee engagement as a mediator in the relationship between entrepreneurial orientation and innovation-driven operational excellence is likely to be found. (Kariri, 2026) Predicts employee engagement as a mediating variable between entrepreneurial orientation and innovation-driven operational excellence.

H6: Employee Engagement mediates the relationship between Entrepreneurial Orientation and Innovation-Driven Operational Excellence.

2.7 Mediating Role of Employee Engagement between IO and IDOE

An intrapreneurial attitude allows employees to take initiative, participate, and innovate. The effectiveness of the practices, however, depends on the level of employee participation. When employees feel empowered and supported in their work, more of them are likely to be emotionally and cognitively engaged in their work tasks. In the SRO framework, employee engagement serves as the response mechanism that links employee stimuli to organizational outcomes. Greater involvement will lead to better implementation of innovative ideas and greater employee participation in achieving operational excellence. The mediating role of employee engagement between Intrapreneurial orientation and innovation-driven operational excellence is evident, as employee engagement is the bridge between the two variables. Employee engagement is the bridge between intrapreneurial orientation and innovation-driven operational excellence; as a result, the mediators of this relationship are expected to lie in aspects of employee engagement. (Saeed AlShamsi et al., 2023)

H7: Employee Engagement mediates the relationship between Intrapreneurial Orientation and Innovation-Driven Operational Excellence.

2.8 Moderating Role of Perceived Organizational Support in the Relationship between Employee Engagement and Innovation-Driven Operational Excellence

Perceived Organizational Support refers to employees' belief that the organization values their contribution and cares about their well-being. Employees develop this perception through management decisions, fair treatment, recognition, access to resources, and support when problems arise. Organizational support theory suggests that employees may respond positively when they believe that the organization values their effort (Rhoades & Eisenberger, 2002). In the present model, POS is not proposed as a separate direct hypothesis. H8 tests whether POS changes the strength of the relationship between Employee Engagement and Innovation Driven Operational Excellence. This distinction is important because a moderator is evaluated by its interaction effect, not by the significance of its constituent main effect.

H8: Perceived Organizational Support positively moderates the relationship between Employee Engagement and Innovation-Driven Operational Excellence, such that the relationship is stronger when POS is high.

2.9 Summary

The literature examined in this chapter illustrates that, through a blend of strategic orientation, employee involvement, and organizational support, aviation organizations can achieve the operational excellence they seek through innovation. Except in psychology, where the Stimulus–Response–Outcome (SRO) model is commonly used to explain the relationships among stimuli, responses, and outcomes, there is no similar model in Entrepreneurship that applies to the motives behind employees' attitudes and behaviours. Entrepreneurial Orientation (EO) and Intrapreneurial Orientation (IO) influence employees' attitudes and behaviours within the Stimulus–Response–Outcome (SRO) psychological paradigm. Employee Engagement



(EE) represents the response through which employees actively participate in organizational initiatives. Innovation-Driven Operational Excellence (IDOE) represents the operational improvements achieved through innovation, employee participation, and effective process management.(Kipngetich, Kithae, & Mwikya, 2025).

Existing research has repeatedly shown that Entrepreneurial Orientation is related to a range of factors important for aviation organizations seeking to deal effectively with changing operational circumstances, such as innovation, proactive decision-making, and organizational adaptability. Similarly, Intrapreneurial Orientation enables employees to be proactive, experiment with new ideas, and drive continuous improvement. This is because both orientations are intended to have an immediate positive effect on operational excellence, driven by innovation, thereby increasing employee engagement. Emerging literature also argues that Employee Engagement is a critical behavioural mechanism for organizational performance. Engaged employees demonstrate greater commitment, make additional efforts, and contribute to operational reliability, service excellence, innovation, and efficiency. Employee engagement becomes particularly important when employees perceive that their organization values their contributions and supports their well-being. It is expected that using POS will strengthen the positive relationship between employee involvement and innovation-based operational excellence. The literature reviewed is adequate to support and inform the construction of the conceptual framework. This implies that the entrepreneurial and intrapreneurial orientation of staff, employee engagement, and the establishment of an appropriate company culture can be important enablers for aviation organizations to become efficient and sustainable through innovation. Considering these findings, this study proposed that EO and IO have a direct effect on IDOE and an indirect effect on IDOE through EE. The proposed model suggested that POS acts as a moderator in the relationship between EE and IDOE (Won, 2020).

Figure 1

Conceptual Framework

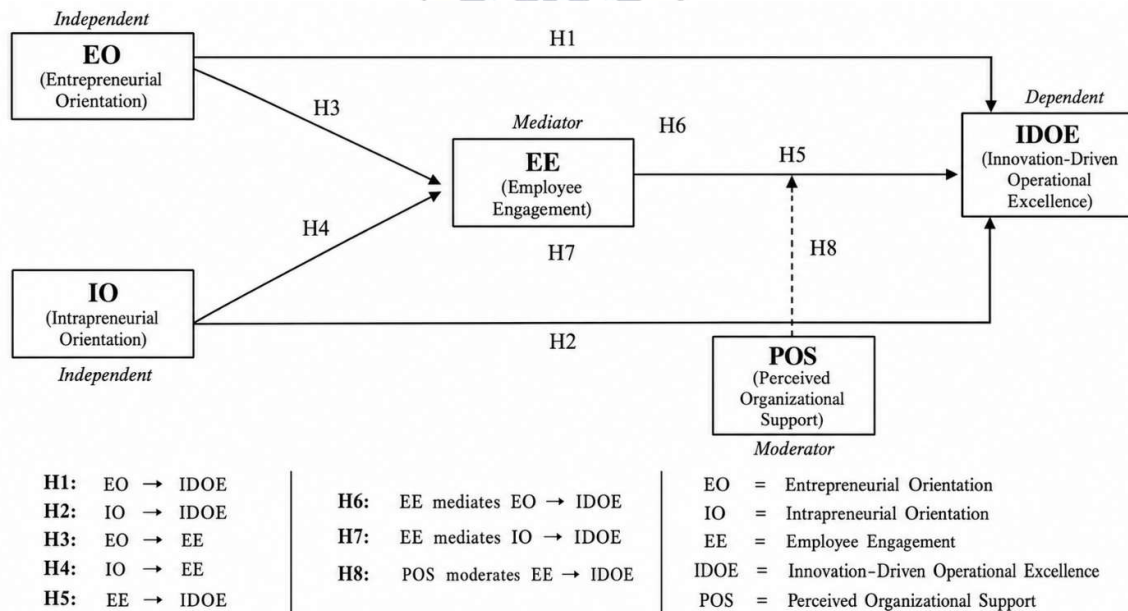


Table 1

Variable and their Measurement

Variable	Definition	Measurement	Source
EO	Organizational tendency to innovate, take risks, and act proactively.	5-point Likert scale	(L. Zhou et al., 2026)



IO	Employees' ability to initiate ideas, experiment, and innovate within the organization.	5-point Likert scale	(Charoensak et al., 2025)
EE	Employees' vigor, dedication, and commitment toward work.	5-point Likert scale	(Schaufeli et al., 2006)
POS	Employees' perception of organizational care and support.	5-point Likert scale	(Eisenberger et al., 1986)
IDOE	Achievement of operational excellence through innovation and continuous improvement.	5-point Likert scale	Adapted from Al-Shami et al. (2022) and Sylva (2020)

3. Methodology

3.1 Research Philosophy

This study is based on a positivist research philosophy and a deductive research approach. The conceptual model and hypotheses were developed prior to data collection, informed by theory and previous studies. Quantitative data were then collected to investigate whether or not the proposed relationships were supported. This sequence is deductive, as it begins with established concepts and theoretical expectations and proceeds to test them empirically. The data measured indicators (EO, IO, EE, POS, and IDOE), and the relationships were statistically analysed, so it is appropriate to adopt a positivist approach.(Champane, 2012)

3.2 Research Design

The research design was quantitative, cross-sectional, and explanatory. Because the study required consistency in subject responses and statistical analysis of the data, a quantitative design was suitable because data were collected from respondents at a single point in time. The study tested the direct effects of EO and IO on EE and IDOE, the effect of EE on IDOE, the two indirect effects via EE, and the interaction between POS and EE. The proposed model did not examine over time; instead, it examined the relationship among the variables at the time of data collection.(Setia, 2016)

The deductive logic entailed defining the constructs and relationships prior to the analysis of the results. So, EO, IO, EE, POS, and IDOE were set in advance as the research constructs, and each category had five indicators. The hypotheses were not modified to fit the statistical results. Only the relationship that had the corresponding pre-specified path meeting the significance criterion was deemed to be supported. This is very relevant for POS. Although the main effect of POS is part of the moderation model, the hypothesis only includes the interaction between POS and EE. Separating terms helps to maintain consistency of the research design.

The explanatory research design follows the stimulus-response-outcome sequence in the study. EO and IO are the stimuli, EE is the response, and IDOE is the outcome. POS is included as the proposed moderator of the relationship between EE and IDOE. The estimated moderation model includes the main effect of POS, the interaction effect, and EE. This main effect is a technical aspect of estimating the moderation effect and is not considered an additional hypothesis. Only the interaction term (POS x EE) was tested under H8.

3.3 Research Technique

This study used a survey method and collected data through a structured questionnaire:

The structured questionnaire used a five-point Likert scale. The use of fixed response options allowed the measurement of the same constructs by employees across various roles. There were five indicators per construct, resulting in 25 questionnaire items in the analysis dataset. The language was directed toward employees' desired thoughts about the practices and improvements of the operation in the organization. A survey was appropriate because the model was a research study that required responses to be comparable across a large sample for multivariate analysis.(Likert, 1932)

The survey method was appropriate for the unit of analysis. Responses were not based on any organizational official record but were answers to respondents' own experiences. By using this method, the



study provided an opportunity to explore employees' experiences of organizational orientation and support. Concurrently, it also has limitations as perceptions can be affected by role, workload, and one's expectations. The analysis aims to identify patterns in staff responses and is not intended to be a substitute for operational data. This is clearly the most effective and dependable way to collect the majority of workers' perceptions of aviation. A survey helped ask the right questions of ground handlers, maintenance technicians, cabin crew, operations planners, and managers who face various challenges in terminals, hangars, flight decks, and corporate offices, while maintaining consistent measurements for each concept. This standardization would be necessary for positivist quantitative research because, if it is not done, the researcher could carry biases, and data would not be comparable, readily analysed, or statistically analysed. (Yilmaz, 2013)

It is about the employee's energy and commitment to work, his or her preoccupation with well-being, fairness and recognition in the workplace as well as caring for the well-being of its employees, the enterprise's operational efficiency, which is possible owing to employees' creativity and innovation, and the need to be efficient by the means of creative and innovative processes within the enterprise. The Likert scale is a measure that balances respondents' understanding and the sensitivity of the analysis to response strength. (Suleiman Awwad & Kada Ali, 2012)

3.4 Sampling Technique

The sampling technique used in this study was purposive non-probability sampling. The operational staff and service personnel working at Allama Iqbal International Airport, Lahore, were selected as participants to provide authentic, knowledge-enriched responses to the various issues discussed in the study. Selection of respondents was based on eligibility criteria, including exposure to airline operations, airport operations, ground handling, maintenance, or related activities. Purposive sampling was used because there was no complete sampling frame of aviation employees, and this approach would have limited access to participants due to shifts and operational responsibilities. This technique limits the use of statistics for generalization, but it allowed access to experienced employees relevant to the research model.

3.5 Sample Size

Power calculation was performed before data collection using G*Power. So, it was calculated using an effect size of 0.15, an acceptable significance level of 0.05, a statistical power of 0.80, and five predictors in the most complex endogenous construct. A minimum sample size of 92 participants was required. Overall, 200 complete responses were obtained, and the complete data set was sufficient for estimating the proposed PLS-SEM model. (Faul, Erdfelder, Buchner, & Lang, 2009).

3.6 Population

The operational employees of Allama Iqbal International Airport, Lahore, who work in airline operations, airport operations, ground handling, and maintenance at the operational level of the airport, were selected from the target population. The study was targeted at employees with direct experience in operations, service delivery, coordination, or process improvement. The employees outside the main target group, such as executive staff who lacked first-hand knowledge of, or exposure to the operational setting, were not represented. The sample therefore consisted of 200 respondents who were eligible to participate in the study.

The selected operational areas reflected various phases in airport operations. Ground handling, airport operations, and activities associated with airlines and maintenance involve different work activities, but all fall under the umbrella of system-based work that requires coordination and reliable performance. These groups were treated as equivalent because department information was not recorded in the final dataset, so no comparisons were made. Their responses were collectively analysed and observed within the targeted aviation environment.

3.7 Data Analysis Tool

Smart-PLS 4 software and the partial least squares (PLS) structural equation modelling procedure were used to analyse the data. For the measurement model, outer loadings, Cronbach's alpha, composite reliability, average variance extracted, and the HTMT criterion were used. The results of the structural model were assessed using the inner VIF values, path coefficients, R-squared values, effect sizes, and SRMR values. t-values, p-values, and confidence intervals for the direct, indirect, and interaction effects were calculated



using bootstrapping. The decision to accept or reject the hypotheses was based on the pathways used for H1-H8. The main effect of POS was not studied as a hypothesis but was instead estimated as a constituent term of the moderation model.(Hair, Babin, Ringle, Sarstedt, & Becker, 2025)

PLS-SEM was used because the research model examined several direct relationships, two mediation effects through Employee Engagement, and one moderation effect involving Perceived Organizational Support. The assessment consisted of two phases. The reflective measurement model was first explored to assess the acceptable reliability and validity of the indicators as measures of their constructs. Second, the structural model was analysed for collinearity, its explained variance, its effect sizes, path estimates, and statistical significance. This sequence ensures that the measurement model is validated before interpreting the structural relationship.

3.8 Unit of Analysis

The individual aviation employee was the unit of analysis because the study examined employees' perceptions of organizational practices, engagement, support, and operational excellence. Each response was assumed to represent a single worker's opinion on EO, IO, EE, POS, and IDOE in the aviation workplace. The notion of operational excellence was recognized as important at the organizational level, but the study measured employees' experiences of organizational practices and evaluated operational improvements. The conclusions were made from the individual's perceptions, and these conclusions should not be used as audits of organizational performance.

3.9 Ethical Considerations

Participation was voluntary, respondents' identities were kept confidential, and the collected data were used solely for academic purposes. Respondents were made aware of the educational nature of the questionnaire and could withdraw without consequences. The analysis did not contain any personally identifiable data.

4. Data Analysis and Results

4.1 Introduction

This chapter presents the analysis of 200 complete responses using Smart-PLS 4. Twenty-five items were used to measure five reflective constructs. The analysis begins with the demographic profile of the respondents, followed by descriptive statistics, measurement-model assessment, structural-model assessment, hypothesis testing, and moderation analysis.

4.2 Demographic Analysis

Demographic analysis was conducted to describe the characteristics of the respondents. Frequencies and percentages were calculated for gender, age, and aviation experience. Frequency represents the number of respondents in each category, while percentage represents their proportion of the total sample of 200 employees. The frequency and percentage distributions are presented in table 2.

Table 2

Demographic profile of Respondents

Demographic characteristic	Category	Frequency	Percentage (%)
Gender	Male	112	56.0
	Female	88	44.0
Age	25–35 years	41	20.5
	36–45 years	79	39.5
	46–55 years	80	40.0
Aviation experience	0-5 years	61	30.5
	6–10 years	69	34.5
	More than 10 years	70	35.0
Total		200	100.0



Table 2 shows that male employees represented 56% of the sample, while female employees represented 44%. The largest age group was 46–55 years (40%), followed closely by employees aged 36–45 years (39.5%). Regarding aviation experience, 35% of respondents had more than six years of experience, 34.5% had four to six years, and 30.5% had one to three years. The sample therefore included employees from different age groups and levels of aviation experience.

4.3 Descriptive Statistics

Descriptive statistics were calculated to summarize respondents' perceptions of the five constructs: EO, IO, EE, POS, and IDOE. The mean represents the average response for each construct, while the standard deviation indicates how closely the responses were distributed around the mean. Higher mean scores indicate more positive perceptions, whereas a larger standard deviation indicates greater variation among respondents' answers.

Table 3

Construct Descriptive Statistics

Construct	Mean	Standard deviation
EO	3.831	.653
IO	3.704	.658
EE	3.929	.578
POS	3.642	.673
IDOE	3.784	.627

Table 3 presents the descriptive statistics of the five constructs. The mean score for each construct was calculated by averaging respondents' ratings across its five questionnaire items. Employee Engagement recorded the highest mean score ($M = 3.929$, $SD = .578$), whereas Perceived Organizational Support recorded the lowest mean score ($M = 3.642$, $SD = .673$). The standard deviation shows the extent to which respondents answers varied around each mean. All mean scores were above the midpoint of the five-point scale, indicating generally positive responses from the surveyed aviation employees.

4.4 Measurement Model

The measurement model was assessed before examining the hypothesized relationship. This assessment determined whether the questionnaire items measured their intended construct's reliability, internal consistency reliability, convergent validity, and discriminant validity, which were examined using outer loadings, Cronbach's alpha, rho_A, composite reliability, AVE, and HTMT. These values were generated by the PLS-SEM algorithm in SmartPLS 4. Outer loadings indicate how strongly each questionnaire represents its corresponding construct. A loading of .70 or above is generally considered acceptable.

Table 4

Outer Loadings

Construct	Indicator	Loading
EE	EE1	0.806
EE	EE2	0.715
EE	EE3	0.842
EE	EE4	0.772
EE	EE5	0.748
EO	EO1	0.766
EO	EO2	0.835
EO	EO3	0.782
EO	EO4	0.827
EO	EO5	0.820
IO	IO1	0.805
IO	IO2	0.804
IO	IO3	0.837



Construct	Indicator	Loading
IO	IO4	0.782
IO	IO5	0.835
IDOE	OE1	0.812
IDOE	OE2	0.834
IDOE	OE3	0.817
IDOE	OE4	0.787
IDOE	OE5	0.854
POS	POS1	0.812
POS	POS2	0.801
POS	POS3	0.859
POS	POS4	0.770
POS	POS5	0.851

As shown in table 4, all 25 reflective indicators had outer loadings above .70. The loadings ranged from .715 to .859, indicating that each item adequately represented its corresponding construct. Therefore, all indicators were retained in the measurement model. These results established acceptable indicator reliability and the reliability and validity of the constructs to be assessed in the next step.

4.4.1 Reliability and convergent validity

Table 5

Reliability and convergent validity

Construct	Alpha	rho A	rho C	AVE
EE	.836	.842	.884	.605
EO	.866	.878	.903	.651
IO	.873	.886	.907	.661
IDOE	.879	.883	.912	.674
POS	.878	.894	.911	.671

The table 4.4 shows Cronbach alpha's value ranged from .836 to .879, rho_A ranged from .842 to .849, and composite reliability values ranged from .884 to .912. All values exceeded the recommended threshold of .70, indicating that the indicators consistently measured their corresponding constructs. AVE values ranged from .605 to .674 and exceeded .50, showing that every construct explained more than half of the variance in its indicators. Internal consistency reliability and convergent validity were established for EE, EO, IO, IDOE, and POS.

4.4.2. HTMT (Heterotrait-Monotrait Ratio) discriminant validity matrix. Discriminant validity was assessed using HTMT. This criterion determines whether the constructs included in the model are empirically distinct from one another. HTMT values below .85 indicate adequate discriminant validity.

Table 6

Heterotrait-Monotrait Ratio

Construct	EE	EO	IO	IDOE	POS
EO	.331				
IO	.229	.100			
IDOE	.497	.266	.102		
POS	.166	.126	.191	.315	

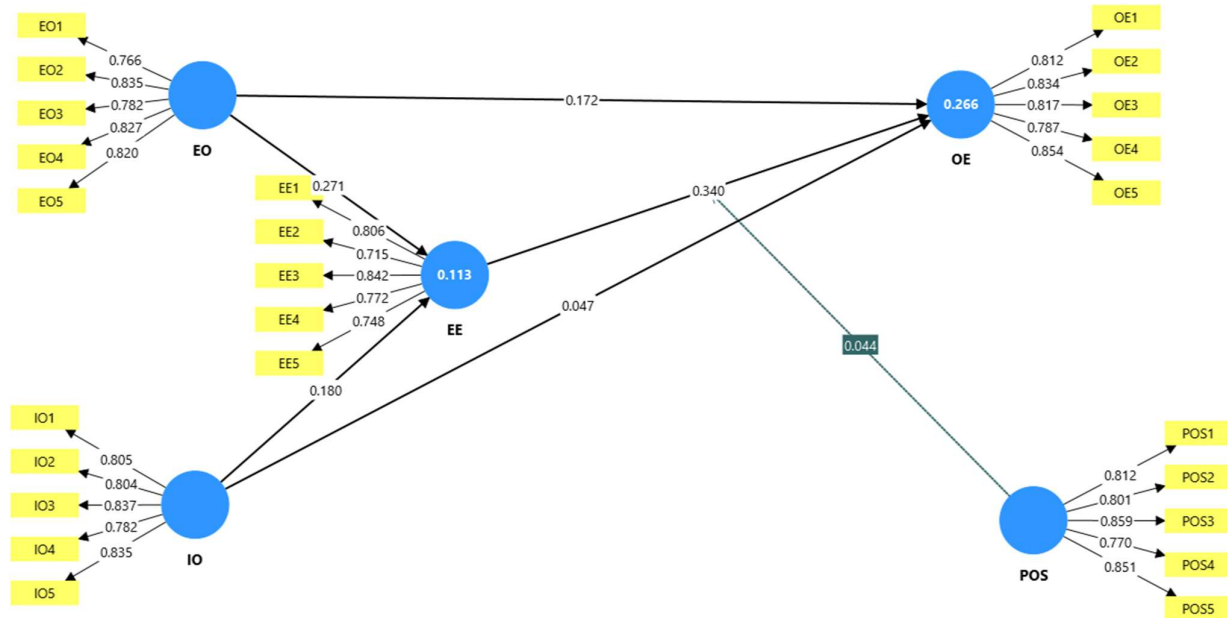
All HTMT (Heterotrait-Monotrait Ratio) values ranged from .100 to .497 and were below .85. Therefore, EO, IO, EE, POS, and IDOE demonstrated adequate discriminant validity.



4.4.3. PLS-SEM model

Figure 2

PLS-SEM model



The Values beside the indicators represent outer loadings, values on the structural paths represent standardized beta coefficients, and values inside the endogenous constructs represent R^2 values. All outer loadings ranged from 0.715 to 0.859 and exceeded the recommended minimum of 0.70. The model explained 11.3% of the variance in Employee Engagement and 26.6% of the variance in Innovation-Driven Operational Excellence.

4.5 Structural Model

The structural model shows the statistical significance of hypothesized paths, along with the explanatory power. It includes the inner VIF values, R-Square and bootstrapping model. The inner VIF (Variance Inflation Factor) values were between 1.005 and 1.190, which does not suggest collinearity problems. The model accounted for 11.3% of the variance in EE and 26.6% of the variance in IDOE. The estimated Standardized Root Mean Square Residual (SRMR) was 0.066, which was below the recommended maximum value of 0.08 and indicated an acceptable model fit. The effect size indicated how much each predictor contributes to the prediction, and the bootstrapping t-test assessed whether the hypothesized coefficients differ from zero. This approach maintained conceptual separation between model quality, explanatory power, practical size, and statistical significance.

4.5.1. Explained variance

Table 7

Endogenous Constructs

Endogenous construct	R ²	Adjusted R ²
EE	.113	.104
IDOE	.266	.248

Employee engagement (EE) has R-square of 0.113 explains variance between entrepreneurial and intrapreneurial orientation, while innovation driven operational excellence has R-square of 0.266 explains variance between employee engagement, intrapreneurial, entrepreneurial, perceived organizational support and the interaction of perceived organizational support with employee engagement.



4.5.2. Hypothesis Testing

Table 8

Hypothesis Testing

Hypothesis	Relationship	β	t	p	Decision
H1	EO $\rightarrow$ IDOE	.172	2.832	.005	Supported
H2	IO $\rightarrow$ IDOE	.047	.618	.536	Not supported
H3	EO $\rightarrow$ EE	.271	4.053	< .001	Supported
H4	IO $\rightarrow$ EE	.180	2.917	.004	Supported
H5	EE $\rightarrow$ IDOE	.340	4.992	< .001	Supported
H6	EO $\rightarrow$ EE $\rightarrow$ IDOE	.092	3.021	.003	Supported
H7	IO $\rightarrow$ EE $\rightarrow$ IDOE	.061	2.380	.017	Supported
H8	POS $\times$ EE $\rightarrow$ IDOE	.044	.669	.503	Not supported

Six hypotheses, H1, H3, H4, H5, H6, and H7, were supported because their p-values were below 0.05. H2 was not supported because the direct IO effect on IDOE was not statistically significant. H8 was not supported because the POS $\times$ EE interaction effect was not significant. Both indirect effects through EE were positive and significant, confirming that EE acted as a moderator. The significant EO direct effect and significant EO indirect effect indicated complementary partial mediation. Both indirect effects through EE were positive and statistically significant, confirming that EE acted as a mediator. For EO, the direct effect on IDOE ($\beta = .172$, $p = .005$) and the indirect effect through EE ($\beta = .092$, $p = .003$) were both significant and positive, indicating complementary partial mediation. For IO, the direct effect on IDOE was not significant, but the indirect effect through EE was significant ($\beta = .061$, $p = .017$), indicating indirect-only mediation. This means that IO contributed to IDOE through its positive effect on Employee Engagement rather than through a significant direct relationship.

Figure 3

Bootstrapping results showing standardized path coefficients and t-values

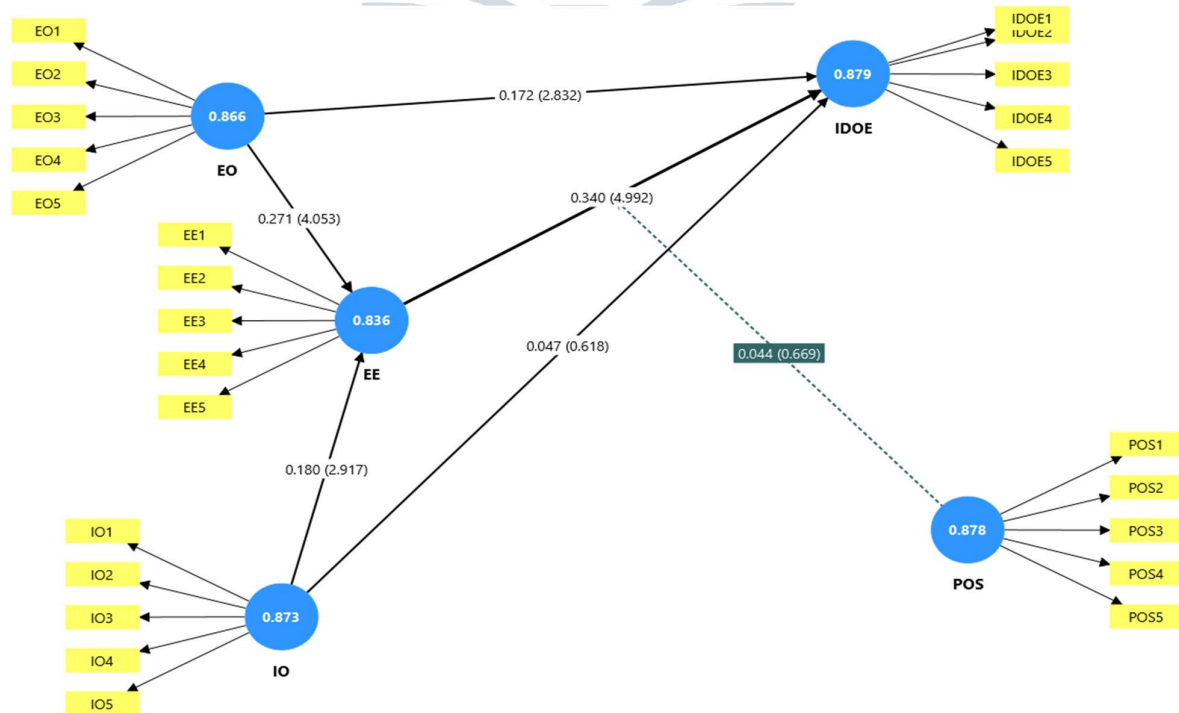




Figure 3 represents the beta coefficient and t-values for each relationship. The first number on each path is the beta coefficient, while the number in brackets is t-value. The values inside the blue circles represent Cronbach's Alpha. A relationship was considered significant when its t-value was above 1.96. The relationship between Intrapreneurial Orientation and Innovation-Driven Operational Excellence, and the interaction between POS and EE, were not statistically significant because their t-values were below 1.96. The p-values for all tested relationships are presented in table 8.

4.5.3. Moderation Analysis. Moderation analysis was conducted to determine whether POS changed the strength of the relationship between EE and IDOE. The conditional effect of Employee Engagement on Innovation-Driven Operational Excellence was examined at low and high levels of Perceived Organizational Support. Although both conditional effects were positive and significant, the interaction effect was not statistically significant.

Table 9

Conditional effect of EE on IDOE

POS level	Moderator value	EE → IDOE effect	T-value	P-value
Low POS	-1 SD	.296	3.591	< .001
High POS	+1 SD	.384	3.651	< .001

The effect of EE on IDOE was significant at both low POS ($\beta = .296$, $t = 3.591$, $p < .001$) and high POS ($\beta = .384$, $t = 3.651$, $p < .001$). However, the interaction effect was not statistically significant ($\beta = .044$, $t = .669$, $p = .503$). Therefore, POS did not significantly moderate the relationship between EE and IDOE, and H8 was not supported. So, -1 SD represents low Perceived Organizational Support, while +1 SD represents high Perceived Organizational Support.

4.5.4 Summary. The measurement model met the stated reliability and validity criteria. EO significantly predicted EE and IDOE. IO significantly predicted EE but did not have a significant direct effect on IDOE. EE significantly predicted IDOE and mediated the effects of both EO and IO. The interaction term (POS x EE) was not significant, so H8 was not supported. The POS main effect was included as a constituent term in the moderation model and was not treated as confirmation of a separate hypothesis.

5. Discussion, Contribution and Conclusion

5.1 Discussion

The study examined the relationship between Entrepreneurial Orientation and Intrapreneurial Orientation with IDOE in aviation industry. It also examined EE as a mediator and Perceived Organizational Support as a moderator. Six hypotheses, H1, H3, H4, H5, H6, and H7, were supported, while H2 and H8 were not supported.

For this reason, H1 suggested that a positive entrepreneurial orientation may influence the IDOE. The path coefficient was positive and statistically significant $\beta = .172$, $t = 2.832$, and $p = .005$; therefore, H1 was supported. This outcome indicates that an organization gains when it is willing to invest in innovation and proactive improvement as a key part of its strategic planning. In aviation, there are procedures to follow, and calculated risk-taking does not mean disregarding them. It refers to examining new methods to increase coordination, service delivery, resource utilization, and operational safety and reliability while avoiding compromises to safety. The findings are compatible with airport research identifying entrepreneurial orientation as related to innovation performance via learning and strategic alignment. This finding suggests that aviation organizations can improve operational performance by innovation, proactive decision-making, and calculated risk-taking in their strategic direction. It involves carefully evaluating new methods before implementation and selecting improvements that maintain safety (Yang, Fan, & Huijuan, 2018).

H1 proposed that management's ability to clarify operational priorities is likely to increase employees' willingness to assist with improvement. The generalization of the demand for innovation can elicit few actions. Innovation that reduces steps, improves information, or reduces repeated service delays puts innovation into practice. Despite this small effect size, estimates of EO on IDOE suggest that EO is a factor of the outcome but not the sole factor in operational excellence. Innovation becomes operationally meaningful



when it simplifies unnecessary process steps, improves the flow of information between departments, and supports more reliable use of resources. EO contributed to IDOE but was not only factor influencing OE.

H2 proposed that Intrapreneurial Orientation positively influences Innovation-Driven Operational Excellence. The direct effect was not significant, with a coefficient of 0.047, a t-value of 0.618, and a p-value of 0.536. This finding indicates that Intrapreneurial Orientation did not directly influence IDOE in this sample. This result indicates that employees' willingness to identify problems, suggest ideas, and take initiative did not directly result in higher IDOE in this sample. Employee initiatives may need to be accepted, supported, and implemented through organizational processes before they produce observable operational improvement. The H7 result indicates that IO contributed to IDOE indirectly by increasing EE, rather than through a significant direct effect on IDOE

The difference between H1 and H2 is helpful. EO is an indicator of organizational-level direction, but IO is an indicator of employees' initiative within the organization. Investment, systems, and priorities can also be impacted directly through strategic direction. Supervisor and other department reactions are often important in determining employee initiative. Intrapreneurship research at airports can also be found, focusing on the need for an organizational environment that allows employees to be involved in improvement. The study on intrapreneurship at airports also emphasizes the necessity of an organizational environment that allows employees to be involved in organizational improvement. (Charoensak et al., 2025).

H3 proposed that Entrepreneurial Orientation positively influences EE. The coefficient of .271 was positive and significant with a t value of 4.053 and a p value less than .001. H3 was supported. Staff become more engaged if there is an obvious interest in improvement on the part of management and if management is prepared to consider responsible change. A proactive organizational environment can make work more meaningful by helping employees understand how their responsibilities contribute to broader organizational goals. Clear innovation priorities may encourage employees to invest greater attention, energy, and effort in operational improvement.

H4: IO has a positive effect on EE. The path coefficient was .180, the t value was 2.917, and the p value was .004. H4 was supported. If employees are involved in identifying problem areas, generating ideas, and making decisions about their jobs, they may feel greater commitment. This applies particularly to airports, where frontline employees directly observe passenger and baggage-handling issues, coordination difficulties, and other operational problems. This is particularly relevant in airports, where frontline employees directly observe passenger and baggage issues, coordination difficulties, and other operational disruptions. Providing employees with opportunities to contribute ideas may therefore strengthen their engagement with their work and organizational objectives.

H5 proposed that EE positively influences Innovation-Driven Operational Excellence. The path coefficient was positive and statistically significant ($\beta = .340$, $t = 4.992$, $p < .001$); therefore, H5 was supported. EE had the strongest direct hypothesized effect on IDOE. Engaged aviation employees are more likely to remain attentive, communicate critical operational information, assist colleagues, and persevere during operational challenges. Previous aviation research has also linked work engagement with innovative work behaviour. (Saeed AlShamsi et al., 2023). This H5 result must not be interpreted as a replacement of equipment, procedures, or staff with training. Instead, engagement affects employees' use of the tools at their disposal. The process is not a success if information is not shared or responsibility is not taken. Similarly, when employees are engaged, they are not the ones to fix all infrastructure and staffing issues. Engagement is identified as a finding and not a systems function.

H6 suggested that EE is a mediating role between EO and IDOE. The specific indirect effect was .092, the t value was 3.021, and the p value was .003. H6 was supported. With the direct EO effect still being significant, the result suggests complementary partial mediation. EO helps IDOE by providing employees with an avenue to get involved in EO activities at the organizational level and by organizing IDOE activities that engage employees. Organizational support for innovation and proactive improvement may contribute to operational excellence directly, while also encouraging employees to become more engaged in implementing improvement initiatives.



H7 suggested that EE mediates the relationship between IO and IDOE. The indirect effect was .061, with a t value of 2.380 and a p value of .017. H7 was supported. The direct effect of IO was not significant; the indirect effect through EE was significant. If this is a pattern, it means it is mediated indirectly only. In this sample, operational excellence was significantly associated with employee initiative primarily when it increased engagement. In this sample, employees' ideas and initiatives contributed to operational excellence when they were accompanied by stronger employee involvement, commitment, and participation.

H8 proposed that perceived organizational support positively moderates the relationship between Employee Engagement and Innovation-Driven Operational Excellence. There was an interaction coefficient of .044, t value of .669, and a p value of .503. H8 was not supported. The conditional EE effects were positive at lower, average, and high POS, but the difference between those slopes was not statistically significant. Although the conditional effects were significant at both POS levels, the interaction effect was not statistically significant. Therefore, H8 was not supported.

The moderation model implies a main effect for the POS, but the Smart-PLS output also provides an estimate of a main effect for the POS. That coefficient is a "supplementary" model outcome, and it is not an eighth hypothesis and does not prove H8 is true. Because of the deductive model, the discussion and conclusion focused on the eight hypotheses developed before the data analysis. There is no independent theoretical claim or a practical claim from the unplanned POS direct path.

This model accounted for 11.3 percent of the variance of EE and 26.6 percent of the variance for IDOE. These values suggest that it is a good, but limited model. Other variances may be due to variables such as leadership, safety climate, workload, training, technology, infrastructure, and coordination (inter- or intra-organizational). The implications of the results should thus be considered as evidence of the proposed relationships and not as an exhaustive description of aviation performance.

5.2 Theoretical Contribution

The study is among the first studies to apply the Stimulus Response Outcome in an operational aviation environment. The stimuli used were EO and IO, the employee's response was EE, and the outcome was IDOE. The important indirect benefits reinforce the framework's main sequence. The findings also help to elucidate the difference between EO and IO. EO significantly influenced IDOE, and impacted EE indirectly. IDOE was directly influenced by none of IO's programs, while IDOE was indirectly influenced by programs of EE that were influential and related to IO. This may explain why it is a bad idea to lump organization-level entrepreneurial direction and employee-level intrapreneurial initiative into the same concept. The main explanatory mechanism was Employee Engagement. EO explained that both EE and the hypothesized effect of EE on IDOE were significant. The mediation results indicate that employee energy and involvement are not an extraneous result of organizational practice. They aid in understanding the link between strategic and people-based orientations and in improving operations. The unsupported moderation result has theoretical value. A strong EE/IDOE relationship was expected, but it was not important for POS interaction. The outcome clearly locates the model's boundary and opens the door to a declaration that support always increases the operational effect of engagement.

5.3 Practical Contribution

Aviation managers need to link innovation to specific aviation requirements. Staff should be aware whether there is an emphasis on promoting service reliability, turnaround performance, communication, resource usage, or something else. Clarity of priorities helps to assess ideas and maintain continuous improvement to meet safety needs. Practical channels should be in place where frontline staff can report issues and offer ideas on how to improve service. There should be a way to acknowledge, review, provide feedback, and make a decision in a suggestion process. When employees present an idea and nobody responds, that likely decreases participation. A good description can maintain trust and engagement even if an idea can't be operationalized. Developing congruence with role, providing training that is relevant for the job, distributing work evenly and on time, communicating, recognizing efforts, and including in decision-making can help sustain employee attention. These practices are especially critical when operations deviate from the norm, when employees are expected to respond nimbly and collaborate across departments. Managers should use



tangible measures to identify improvements. Some examples include delay minutes, turnaround time, repeated service failures, baggage performance, passenger complaints, audit findings, and the number of approved employee ideas implemented. This helps keep innovation linked to outcomes, rather than treating many suggestions as successful innovations.

Although H8 was not supported, the findings still suggest that organizations should continue providing organizational support because it remains important for employee well-being. While ongoing management support is essential to the organization's function in supporting employees, the presumption that support alone is enough to improve the impact of engagement on IDOE shouldn't be assumed. This was not supported with the present study. Given these apparent innovation priorities and engagement, a focus for practical recommendations should be on the identified innovation priorities and engagement, supported by the hypothesized results.

5.4 Limitations

Data were collected using a non-probability purposive sampling method and at one airport location. The respondents were relevant to the research purpose, but the sample does not represent a probability-based sample of all the aviation employees in Pakistan. The findings must be considered in the characteristics of the achieved sample and the working environment of Allama Iqbal International Airport, Lahore.

The study employed a cross-sectional design in which data were collected from respondents at a single point in time. Consequently, the study could identify relationships among the constructs but could not examine changes over time or establish causal relationships. Since all constructs were measured using the same questionnaire, common bias method may have influenced some of the observed relationships. Gender, age, and aviation experience were collected to describe the sample; however, differences among these demographic groups were not examined. Other occupational characteristics, including education, department, shift pattern, and supervisory experience, were not collected. Therefore, comparisons based on these characteristics could not be conducted. Furthermore, IDOE was measured through employees' perceptions rather than independent operational records. Consequently, the findings represent perceived operational excellence rather than audited operational performance. The model accounted for some (but not all) of the variation in EE and IDOE.

5.5 Future Directions

More future studies are needed to involve employees of several airports, airlines, and ground handling organizations. Researchers would find it more useful to understand if the results could be replicated in other organizations and job groups if there was a larger and more varied sample. If employees are fully listed and organization access, then using either probability sampling or stratified sampling would enhance representation. If longitudinal studies, EO, IO, and EE could be assessed at one point and operational outcomes assessed at a later time. Demographic and occupational attributes should also be kept investigating differences between groups. Incorporating questionnaire responses with operational data would give a better idea of IDOE. Examples of suitable records might be completing timeliness, baggage performance, safety, service complaints, or projects to improve. There are possibilities to expand model with leader style, psychological safety, safety climate, workload, digital readiness, training quality, and cross-department coordination. Future studies should further analyse the interaction effect of POS in addition to the main effect of POS, which in turn should be retested with larger samples.

5.6 Conclusion

The present study was based on eight hypotheses linking to EO, IO, EE, POS, and IDOE of operational aviation employees at Allama Iqbal International Airport Lahore. The instrument used was reliable and valid. The structural model results confirmed H1, H3, H4, H5, H6 and H7. H2 and H8 were not supported. EO is believed to have a direct impact on IDOE, and an indirect impact through EE. IO did not have a significant direct effect on IDOE; however, it had a significant indirect effect through EE. The integration of both orientations with operational excellence was therefore the centre of EE. The proposed boundary condition was not confirmed because the study did not find a significant interaction between EE and IDOE in the POS category. The results show that aviation companies should merge clear entrepreneurial management with



significant employee involvement. Employees should have a dedicated pathway to share their ideas; managers should define the priorities for creating that pathway, engage employees regularly through day-to-day work practices, and review the outcomes of their actions by measuring operational results. The supplementary POS main effect was not treated as additional hypotheses, the conclusion reports only the relationships specified in H1-H8.

Contribution of Authors

All the authors participated in the ideation, development, and final approval of the manuscript, making significant contributions to the work reported.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

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Informed Consent

Informed consent was obtained from all participants.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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