

Charting the Future: Analyzing Innovative Strategies in Strategic Management for Sustainable Performance Excellence and Business Leadership in the Telecom Industry

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Abstract: This paper aims to explore how sustainable performance excellence can be achieved and business leadership enhanced in the telecom industry through innovative approaches. It analyzes the role of organizational culture of innovation (OCI), employee engagement in innovation (EEI), technology adoption and integration (TAI), and customer-centric innovation (CCI) in achieving long-term strategic success. The research design was quantitative, utilizing a structured questionnaire that was sent to 300 managers and employees of large telecom companies, including Huawei, Vivo, Samsung, and Oppo, operating in Pakistan by 2025. The data were tested with structural equation modeling (SEM) with the partial least squares (PLS) algorithm to test the hypothesized relationships. The findings show that all four relevant variables, namely OCI, EEI, TAI, and CCI, have a positive effect on sustainable performance excellence with strong path coefficients of 0.398, 0.415, 0.387, and 0.429, respectively. The model explained sustainable performance at a considerable rate ($R^2 = 0.682$) of 68.2%. The results highlight the significance of business leadership in fostering a culture of innovation, rewarding employee efforts, strategically embracing new technologies, and being customer-oriented. This work offers a multi-dimensional model of realizing resilience and sustainable excellence, with implications for industry leaders, as well as adding to the literature in strategic management in the emerging markets.

Keywords: business leadership, customer-centric innovation, employee engagement, organizational culture of innovation, strategic management, sustainable performance excellence, technology adoption.

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INTRODUCTION

The telecommunications sector of the world today is undergoing unprecedented flux leading to fast-moving technological innovation, the accelerated rate of digitalization, and continuously shifting consumer expectations. The Pakistani telecom industry is no exception, as it is at the crossroads of these disruptive forces. To businesses in this industry, this complexity is not just a business task but a strategic management challenge and a business leadership test. This capability to attain and maintain performance excellence is now pegged on the capacity to engage in sustained and integrated innovation. This paper postulates that a synergistic strategy is required, one that goes beyond individual strategies to a holistic approach where culture, talent, technology, and customer focus are strategically aligned.

Although the role of innovation has been widely recognized in management literature (Osman et al., 2023), a significant gap remains in understanding how interrelated innovation strategies collectively contribute to long-term success. The available literature tends to study these factors independently or in the context of developed and stable markets. Nonetheless, these models do not apply in the case of emerging economies such as Pakistan, where the regulatory environment is unique, there are infrastructural problems, and consumer dynamics are particular. The conventional strategic management methods tend to be ineffective in these dynamic environments, as they lack the agility and robustness needed to ensure sustainable performance (Shehadeh et al., 2023). This poses a pressing issue to the Pakistani telecom companies: unless there is a coherent and contextually relevant structure, they will continue having their different innovation initiatives living in silos, and they will not be able to leverage their flexibility to the full extent of their competitiveness in an industry that continues to evolve at a steady pace. This study aims to fill this gap by creating and experimenting with a sustainable performance integrated model.

This paper focuses on four critical constructs, namely, organizational culture of innovation (OCI), employee engagement in innovation (EEI), technology adoption and integration (TAI), and customer-centric innovation (CCI). The main assumption is that the combination of these factors, in which an enabling culture enables engaged employees utilizing modern technologies to provide customer-centric solutions, has a synergistic effect, which is even greater than the whole.

This study is theoretically supported by the resource-based view (RBV), which presents a firm as a distinct set of resources and capabilities that are the major determinants of competitive advantage (Kahn, 1990). OCI, EEI, TAI, and CCI in this framework are not operational tactics but rather strategic and intangible capabilities. When nurtured and integrated, they create a strong source of long-term differentiation and performance that would be difficult for competitors to imitate. Experimentation requires psychological safety and values that are promoted by an innovative culture.

Such culture, consequently, contributes to EEI, making the workforce no longer passive contributors but active contributors of innovative ideas. It is these inspired employees who will drive the successful adoption and integration of new technologies, serving as multipliers of innovation. Lastly, all this internal engine should be guided by a profound intelligence-based knowledge of the market and customer needs, so that all the innovative activities generate real value and build a stronger market presence.

The topicality of the given work is dual. To the practitioner, it offers a validated, empirically developed model of Pakistani telecom leaders. It provides concise direction on how strategic efforts should be concentrated to create organizational resilience, leading to growth and attaining a sustainable competitive advantage in a dog-eat-dog market. To academia, it contributes to the strategic management literature by further generalizing the application of RBV to the dynamic, emerging market settings, demonstrating the synergistic strength of integrating particular innovation-oriented abilities.

This study offers a critical roadmap on the direction to follow in the future of the Pakistani telecom industry by answering the main question of how OCI, EEI, TAI, and CCI can be combined to create sustainable performance excellence.

LITERATURE REVIEW

The contemporary business landscape, characterized by intense global competition, has necessitated the adoption of innovative business strategies as a cornerstone of effective strategic management. The primary requirement for organizations is to respond quickly to a changing market environment and adapt to shifting customer demands in order to maintain and enhance their long-term performance. The literature review gives a comprehensive analysis of four key innovation-related constructs, namely TAI, EEI, OCI, CCI, and their synergistic outcome, namely sustainable performance excellence (SPE).

The change innovation within the organization is characterized by a culture of innovation that applies across various levels within an organization.

Organizational Culture of Innovation

Innovation change is defined as the culture of innovation present at different levels within an organization. The term 'organizational culture of innovation' refers to the norms, values, and behaviors that foster constant innovation in firms by encouraging creativity, experimentation, and risk-taking (Muchtadin & Sundary, 2023). This kind of culture enables organizations to be flexible and resilient, incorporating innovation into both day-to-day operations and the strategic planning process. According to Martins and Terblanche (2003), OCI emphasizes open communication, failure tolerance, and cross-functional working as key aspects. Additionally, this argument is supported by Osman et al. (2023), who also demonstrate how innovative culture can align activities with organizational goals across different fields.

In the Pakistani telecommunications industry, OCI is the catalyst of radical and incremental innovations. This strategy is exemplified by Huawei's extensive R&D efforts in deploying 5G technology, as well as the participatory culture of product development in Xiaomi and the AI-enhanced user experiences in Oppo, which represent various forms of innovative cultures (Guo et al., 2019b). These different methods point out the ways the companies differentiate the culture of innovation from their own organizational background and market orientation.

The empirical evidence consistently demonstrates that, financially, organizations with strong OCI are more successful in terms of market share than their competitors (Saoudi et al., 2023). Such a competitive advantage remains in place despite various market conditions, as confirmed by Qureshi et al. (2024) in their longitudinal analysis. The innovation culture enables organizations to collaborate on finding solutions to problems and learn collectively, thereby allowing them to navigate volatile markets (Guo et al., 2019).

A good example is when Vivo, a company developing smartphone cameras, uses collaborative teams, and Huawei, with a culture of failure tolerance, facilitates the process of development of its products through an iterative approach (Fan et al., 2025). The cases demonstrate how cultural aspects can become tangible outcomes of innovation. Another strategy employed by Samsung in Pakistan involves cross-functional involvement, integrating marketing and engineering skills to create consumer-focused products (Yan et al., 2021). These strategic measures enable telecommunications firms to continue gaining competitive advantages as they respond to new technologies, such as 6G, and shifting consumer preferences. According to Alamuri et al. (2025), essential facilitative factors include targeted training programs, innovation labs, and policies with a focus on R&D, whereas Zhang (2023) highlights cross-functional partnerships as important in maintaining the culture of innovation.

Employee Engagement in Innovation

EEI) refers to the voluntary involvement and mental dedication of employees towards innovation activities, driven by intrinsic motivation, creativity, and enthusiasm (Kwon & Kim, 2019). This involvement takes the form of employees who are willing to perform tasks that go beyond their regular duties, driven by their genuine interest in innovative activities. Kuntari (2022) also addresses the psychological aspects, which include the importance of emotional attachments in supporting innovative behaviors in the long run. An effective OCI is an inherent factor that fosters EEI because it provides the employees with the feeling of psychological safety, autonomy, and appropriate resource support (Kahn, 1990). This base builds up slowly on the innovative ability of employees and fomentation of risk-taking.

In the telecom sector of Pakistan, the EEI behavior takes multiple forms: Huawei workers driving 5G development, Xiaomi workers improving products based on customer feedback, and Oppo workers developing AI-driven camera technology (Guo et al., 2019b). These instances demonstrate how the involvement converts to tangible breakthroughs in various areas of technology. A study conducted by Ali et al. (2023) establishes EEI as the essential linkage between OCI and the final innovation results, facilitating evolutionary and radical innovations, such as the development of 6G. This correlation makes a considerable contribution to productivity and responsiveness within the organization. Vo and Tran (2024) prove it with technology companies. The strategic importance of engaged employees continues to increase as one of the competitive differentiators in the knowledge-based sectors.

Several approaches to EEI can be used to foster it, considering various motivational factors. The innovation workshops at Vivo promote creative thinking within the context of systematic ideation, whereas prototyping at Huawei embraces failure and fosters an experimental approach to working (Fan et al., 2025). Similarly, Samsung Pakistan's autonomous R&D teams empower technical employees to explore new solutions (Yan et al., 2021). Both methodologies focus on specific drivers of engagement and promote the overarching goal of innovation. Various techniques are used to improve EEI in Pakistani telecom companies. The technical capabilities of Huawei are developed through AI and 5G training programs, whereas Xiaomi crowdsourcing systems can collect employee ideas in an organized manner (Meng et al., 2019). Oppo uses

recognition systems to award creative input, while Vivo uses cross-functional teams to find a solution to complicated problems. These different strategies enable firms to utilize their human resources well during periods of dynamism in the market.

Technology Adoption and Integration

Technology adoption and integration (TAI) is a proactive process of integrating technologies, such as 5G, AI, IoT, and cloud computing, to enhance operational efficiency, innovation capability, and organizational flexibility (Liang et al., 2023). TAI enhances the decision-making process, improves the accuracy of operations, and increases responsiveness to customers when correctly aligned with business goals, leveraging highly developed data analytics and automation (Wang, 2021). This alignment has provided technological investments to generate significant business value as opposed to being isolated technical upgrades.

Some of the successful TAI implementations can be found in the Pakistani telecom market. Huawei applies AI algorithms to maximize the performance and reliability of 5G networks, whereas Xiaomi uses big data analytics and develops personalized smartphone experiences (Guo et al., 2019). In the meantime, Oppo uses IoT functions in connected devices to create ecosystem values. These diverse applications reveal that firm positioning and market strategy vary in the adoption strategies of technologies.

The implementation of technology presents significant organizational challenges, including resistance to change among employees, incompatibility with existing systems, and high training needs. The study by Parida et al. (2019) shows that a good OCI and EEI can overcome these obstacles by establishing organizational preparedness to implement digital transformation. Human and cultural aspects are usually as significant as technical factors when implementing technologies. TAI achieves high productivity gains, typically 30-40 percent, and significantly shortens innovation cycles through workflow automation and data-driven workflows (Saoudi et al., 2023).

These efficiency gains have become important in sustaining competitive advantage in fast-changing markets. Dwivedi et al. (2020) also confirm the correlation between the adoption of technology and operational performance and report a steady increase in various sectors of industry.

Several case examples well illustrate these advantages. Robotic process automation (RPA) implemented by Vivo can reduce the processing time of the supply chain by approximately 70%, whereas the system of predictive maintenance implemented by Huawei has improved the quality and reliability of the networks (Fan et al., 2025). On the same note, Samsung Pakistan has been utilizing cloud computing infrastructure to streamline R&D processes and accelerate product development. Both cases illustrate the idea that specific business issues can be solved through the targeted application of technology and provide tangible returns. Firms employ various strategies to address adoption challenges. Xiaomi implements special AI training, which enables the development of internal capabilities, whereas Oppo creates specialized task forces to address IoT integration issues (Guo et al., 2019).

Huawei has committed a significant number of resources to nurturing engineering talent, ensuring that TAI meets its strategic organizational goals. These strategies are useful in making companies survive in a changing technological environment through the development of sustainable internal capabilities.

Customer-Centric Innovation

Customer-centric innovation (CCI) is a strategic focus of an organization, involving the design and provision of innovations that directly respond to customer needs, improve customer satisfaction, and create a sustainable competitive advantage by generating long-term customer loyalty. This approach maintains that innovation activities are informed by actual customer data, as opposed to assumptions within (Parida et al., 2019). Combinations between EEI and CCI provide strong synergies. Direct customer insights would give the innovative work of employees a sense of direction and purpose, which would reinforce their motivation and focus their activities on the market's needs (Kwon & Kim, 2019).

Some of the tools that organizations typically use to capture customer feedback systematically and engage users directly in the innovation process include social media analytics, customer relationship management systems (CRM), and co-creation platforms (Homburg et al., 2009). The mechanisms ensure that customer input is translated into practical innovation projects.

In the Pakistani telecom industry, other companies have achieved success through the application of CCI. For example, Xiaomi utilizes social media analytics to customize smartphone features, whereas Huawei employs CRM systems to tailor 5G offers to specific customer groups (Meng et al., 2019). On the same note, Oppo is developing its AI camera technology based on direct customer feedback, and Vivo is streamlining camera performance based on detailed user input (Zhang, 2023). These practices explain how the customer insight may be directly utilized to facilitate product development and improvement. There are also some

challenges that CCI can be implemented without, such as data overload, privacy, and cross-departmental coordination. The solution to these problems is to have a strong data management system and a clear strategic orientation towards innovation (Frishammar & Horte, 2007; Zhang, 2023). These complexities may be overcome via a strong organizational culture of innovation (OCI) and through inculcating high levels of EEI, which would enable people to work together and share common aims and objectives within the organization.

Performance CCI has a considerable impact, which, in most instances, may result in quantifiable benefits, such as a 20 percent performance increase and a 15 percent market share (Frishammar & Horte, 2007). Indicatively, Xiaomi's competitiveness in the mid-range smartphone market, despite the presence of other rivals like Huawei, can be attributed to its understanding of customers over time. An analysis of customer trends is the driving force behind Huawei's roadmap to 6G technology (Belussi et al., 2019). These examples demonstrate how customer-centricity not only informs short-term innovations but also a long-term strategy.

Huawei, Xiaomi, Vivo, and Oppo are leading telecommunications companies that have achieved sustainable innovation by effectively managing customer insights. They use the power of sophisticated CRM, analytics software, and training to ensure that feedback from customers is the main driver of innovation decisions (Ali et al., 2024). This strategy is supported by cross-functional integration, which ensures that all departments coordinate their actions in accordance with customer requirements (Fan et al., 2025). These practices combined create robust and customer-driven competitive advantages in highly volatile markets.

Interactions and Synergistic Effects

Sustainable performance excellence in the Pakistani telecom industry is a byproduct of the synergistic relationships that exist between OCI, EEI, TAI, and CCI. OCI provides the necessary background, fostering psychological safety, internal drive, and purpose, which enables employees to adopt new technologies and act on customer feedback (Alamuri et al., 2025). This base culture facilitates the growth of other elements of innovation.

EEI is the main engine in this scenario, with committed employees using the cultural values and technological resources to create solutions that will respond to market reality. Their dedication converts abstract strategies of innovation into tangible organizational results. TAI is a facilitator and catalyst that accelerates innovation cycles by utilizing collaborative tools, data analytics, and automation, and it enhances the role of customer feedback in product development. This technological infrastructure enhances human genius and sensitivity to the market.

CCI provides essential guidance on the changes needed to set market trends and address customer needs, making it worthwhile to invest in technology and culture. This customer orientation keeps the employees motivated by showing the practical value of their innovative work.

Combined, these aspects form reinforcing feedback loops that favor sustainable innovation, organizational alignment, and adaptability (Alamuri et al., 2025). This combined strategy helps businesses navigate uncertain times with a view to capitalizing on new opportunities. A combination of these closely related strategies, applied in a balanced manner, can bring sustained competitiveness to telecom firms in Pakistan, enabling them to counteract the rapidly changing market environment.

Long-term implications and situational factors that impact such relationships should be studied in future research to optimize strategies for sustainable performance excellence further. This type of research would give more information on the way these synergies would change with time and market environments.

METHODOLOGY

Research Design

This study employed a quantitative research design to systematically investigate the relationships between the constructs of OCI, EEI, TAI, CCI, and sustainable performance excellence (SPE). This design was chosen to allow for objective measurement and robust statistical testing of the proposed hypotheses.

Research Questions

The primary research question is *Are OCI, EEI, TAI, and CCI strategies that would allow the Pakistani telecom industry to perform sustainably?*

Sub-questions are:

- Does it really matter whether an organization can innovate as a key to sustainable growth?
- Does the effect of employee engagement in innovation have any impact on long-term performance?
- Does sustained success have a positive relationship with technology adoption?
- Does customer-centric innovation focus improve sustainable performance?

Hypotheses

H1: Better sustainable performance in the telecom industry's strategic management is positively connected with a robust organizational culture of innovation (OCI).

H2: High levels of employee engagement in innovation (EEI) have a big impact on long-term strategic management effectiveness in the telecom industry.

H3: Strategic management performance is improved over time when the telecom industry adopts and integrates technology (TAI) effectively.

H4: The telecom industry's strategic management's pursuit of sustainable performance excellence is favorably correlated with customer-centric innovation (CCI).

The questionnaire was structured into sections that directly corresponded to these hypotheses. Specifically, questions measuring OCI were designed to test H1, questions on EEI were included to test H2, the TAI section provided data for H3, and the CCI questions were formulated to evaluate H4. This direct linkage ensured that each hypothesis could be empirically validated using the collected survey data.

Conceptual Framework

The conceptual framework of this study illustrates the proposed association between the variables. The model is that OCI, EEI, TAI, and CCI are independent variables, which directly affect the dependent variable, SPE. The model is based on the conceptualization of the four constructs found in the theory of resource-based view (RBV), which adds a synergistic effect to the competitive advantage and utilizes these four capabilities strategically and intangibly (see Figure 1).

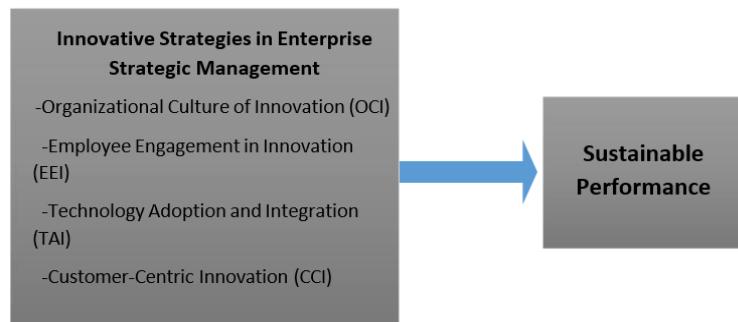


Figure 1. Conceptual Framework

Source: compiled by the authors based on Green et al. (2012); Kwon & Kim (2019); Schaufeli & Bakker (2003).

Figure 1 shows the postulated direct relationship between the four independent variables and the dependent variable in this study. The model is based on the resource-based view (RBV), which considers OCI, EEI, TAI, and CCI as desirable and intangible strategic capabilities. These capabilities are not presented in isolation; they are shown as a set of factors that are synergistic and directly lead to the realization of SPE. According to the framework, a powerful culture of innovation fosters engaged employees, who effectively introduce and adopt new technologies and are guided by profound customer insights. It is postulated that the convergence of these factors will form an effective reinforcing system, offering high competitive advantage and organizational performance in a dynamic competitive market. The references used in each construct represent the defined scales and theoretical basis of the previous literature on which this study has been based in measurement and hypothesis formulation.

Data Collection and Instrument Development

To collect data, a structured questionnaire was created. To achieve content validity, the measurement scales for all five constructs were carefully developed and revised using existing instruments from the current academic literature. The scale, its source, and a brief description are presented in the form given below.

- *Sustainable Performance Excellence (SPE)*. The scale has been modified based on the work of Green et al. (2012). It comprises 8 questions on a 5-point scale to gauge the growth and progress in the main areas of performance of the organization, including market share, profitability, and competitive position, over the last three years.
- *Employee Engagement in Innovation (EEI)*. It is a scale based on the contextual adaptation of Kwon and Kim (2019) and Schaufeli and Bakker (2003) and contextualized by Hogan and Coote (2014). It includes 10 items measured on a 7-point Likert scale, covering the vigor, dedication, and innovative behaviors of employees in the work situation.

- *Organizational Culture of Innovation (OCI)*. This scale was modified according to Alguezaui and Filieri (2014). It comprises 7 questions that are gauged on a 5-points Likert scale assessing the degree to which the environment of an organization encourages and compensates risk-taking, idea generation, and entrepreneurial thought.
- *Customer-Centric innovation (CCI)*. The scale was developed based on the idea of customer involvement in new product development (NPD) and was operationalized according to Cao (2022). It has 5 items on a 7-point Likert scale, which measures the systematic inclusion of customer feedback and active participation in the innovation process.
- *Technology Adoption and Integration (TAI)*. This scale is based on the technology acceptance model (TA Model) created by Davis (1989) and comprises 6 items on a 7-point Likert scale. It is split into two scales, perceived usefulness (3 items) and perceived ease of use (3 items), which evaluate the attitude to technology, which supports customer-centric innovation.

Everything in the constructs was measured using a Likert-scale format, ranging from *strongly disagree* to *strongly agree*, except for the SPE scale, which was measured on an improvement scale with options ranging from *much worse* to *much better* (see Appendix for the full instrument).

Statistical analysis of the primary study data was then used to validate and confirm the reliability of the adapted instrument, where all constructs were found to have high internal consistency and convergent validity, as discussed in the Results section. In 2025, data were collected using an online questionnaire that was sent to the employees and managers of leading telecom service providers in Pakistan, such as Huawei, Vivo, Samsung, Oppo, and Xiaomi.

Population and Sampling Technique

The target population consisted of employees and managers from large mobile phone manufacturing companies in the Pakistani telecom industry. Since the population was specialized and it was challenging to obtain a comprehensive sampling frame, the snowball non-probability sampling method was employed. This approach was based on preliminary contacts in the target companies to recommend other suitable participants.

Sample Size and Demographics

As per the suggestions in Comrey and Lee (2013), a sample size of 300 respondents was to be achieved and met. This is an acceptable sample size to achieve complicated multivariate analyses such as structural equation modeling (SEM). Table 1 below shows the demographic characteristics of the end sample.

Table 1. Demographic Profile of Respondents (N = 300)

Demographic Variable	Category	Frequency	Percentage, %
Gender	Male	192	64.0
	Female	108	36.0
Age Group	20-30 years	125	41.7
	31-40 years	135	45.0
	41-50 years	35	11.7
	Above 50 years	5	1.6
Job Position	Top Management	30	10.0
	Middle Management	120	40.0
	Junior Staff / Engineers	150	50.0
Work Experience	Less than 5 years	75	25.0
	5-10 years	150	50.0
	More than 10 years	75	25.0
Company	Huawei	75	25.0
	Vivo	65	21.7
	Samsung	70	23.3
	Oppo	50	16.7
	Xiaomi	40	13.3

Source: compiled by the authors.

The demographic composition of 300 respondents from the Pakistani telecom industry who participated in this research is shown in Table 1. The sample is composed of 192 men (64.0) and 108 women (36.0). With respect to age, the highest frequency falls within the 31–40-year age bracket (45.0%), and the second highest occurrence is between the ages of 20 and 30 years (41.7%), indicating that the sample is mainly composed of middle-aged career individuals. Regarding the job positions, 50.0 percent of the sample consists of junior staff and engineers, 40.0 percent are middle management, and 10.0 percent are top management. This distribution ensures the inclusion of various organizational levels of perspective. The work experience is balanced, with

half of the respondents (50.0%) having 5 to 10 years of experience, and the other half (25.0%) having experience of less than 5 years or more than 10 years. Lastly, the sample comprises five large telecom companies operating in Pakistan, with Huawei making the largest contribution (25.0%), followed by Samsung (23.3%), Vivo (21.7%), Oppo (16.7%), and Xiaomi (13.3%). Such a profile attests to the fact that the information is a heterogeneous and applicable cross-section of the target group, which is appropriate to study the research questions of the study.

Data Analysis

The data obtained was analyzed using SmartPLS 3.0 software in two steps:

- **Measurement Model Evaluation.** The main study data was rigorously evaluated in terms of assessing the reliability and validity of the constructs. This was done by testing the indicator loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) to test whether the scales were reliable and different, as explained in the Results section.
- **Structural Model Assessment.** The working hypotheses were evaluated through the implementation of the partial least squares (PLS) algorithm. The coefficient of determination (R^2) was used to measure the explanatory power of the model, and the significance of the path coefficients was evaluated using a bootstrapping procedure with 5,000 subsamples. The predictive relevance of the model was tested using Stone-Geisser's Q^2 value (blindfolding).

RESULTS

Measurement Model

A measurement model was tested to assess the reliability and validity of constructs such as OCI, EEI, TAI, CCI, and SPE. Indicator loadings, Cronbach's alpha, CR, average variance extracted (AVE), discriminant validities, and model fit were also conducted by means of Smart PLS 3.0. Initially, the five constructs included a total of 28 items, which were reduced by 5 items (OCI1, EEI2, TAI3, CCI4, SPE1), with outer loadings of less than 0.7, as suggested by innovation (Kwon & Kim, 2019). The model that was retained ultimately consisted of 23 items.

As shown in Table 2, all outer loading values are above 0.7, indicating that the level of item reliability is acceptable for innovation (Kwon & Kim, 2019).

Table 2. Measurement Model Results

Construct	Item	Loading	Cronbach's Alpha	Composite Reliability
Organizational Culture of Innovation (OCI)	OCI2	0.702	0.815	0.882
	OCI3	0.773		
	OCI4	0.765		
	OCI5	0.761		
Employee Engagement in Innovation (EEI)	EEI1	0.821	0.847	0.893
	EEI2	0.805		
	EEI3	0.788		
	EEI4	0.776		
Technology Adoption and Integration (TAI)	TAI1	0.815	0.832	0.889
	TAI2	0.798		
	TAI4	0.784		
	TAI5	0.771		
Customer-Centric Innovation (CCI)	CCI1	0.803	0.819	0.881
	CCI2	0.776		
	CCI3	0.791		
	CCI5	0.764		
Sustainable Performance Excellence (SPE)	SPE1	0.834	0.856	0.901
	SPE2	0.819		
	SPE3	0.802		
	SPE4	0.787		
	SPE5	0.774		

Source: compiled by the authors.

In Table 2, the values of Cronbach's alpha are between 0.815 and 0.862, with composite reliability being between 0.882 and 0.906, all of which are above 0.7, so internal consistency is good. All AVE values lie between 0.610 and 0.650, which is well above 0.5, indicating that the tests have strong convergent validity.

Discriminant Validity

The Fornell-Larcker criterion was administered as an evaluation of the discriminant validity. As shown in Table 3, the square roots of AVE (in bold) and inter-construct correlation are presented.

Table 3. Fornell-Larcker Criterion

Constructs	OCI	EEI	TAI	CCI	SPE
Organizational Culture of Innovation	0.781				
Employee Engagement in Innovation	0.736	0.787			
Technology Adoption and Integration	0.749	0.762	0.789		
Customer-Centric Innovation	0.728	0.753	0.741	0.797	
Sustainable Performance Excellence	0.717	0.739	0.725	0.764	0.806

Source: compiled by the authors.

As shown in Table 3, the square roots of AVE of every construct are greater than their correlations with the rest of the constructs, proving discriminant validity. The model fit is indicated by the low value of the standardized root mean square residual (SRMR) of 0.073, which is lower than the 0.08 threshold (Dwivedi et al., 2020).

Structural Model

The structural model was fitted to examine hypotheses (H1-H4) with the partial least squares (PLS) algorithm plug-in of Smart PLS 3.0. Explanatory power and effect sizes were determined by calculating the coefficient of determination (R^2) and effect sizes (f^2). In Table 4, the model explains 68.2 percent of the variance in sustainable performance excellence, which means that there is high explanatory power of explanation (Parida et al., 2019).

Table 4. R-Square

Endogenous Construct	R-Square
Sustainable Performance Excellence (SPE)	0.682

Source: compiled by the authors.

The effect sizes (f^2) were determined to determine the substantive effect of each of the predictor variables on sustainable performance excellence (SPE) and are shown in Table 5.

Table 5. F-Square

Predictor	Effect Size (f^2)
Organizational Culture of Innovation	0.305
Employee Engagement in Innovation	0.328
Technology Adoption and Integration	0.294
Customer-Centric Innovation	0.341

Source: compiled by the authors.

Table 5 denotes effect sizes with f^2 between 0.305, 0.328, 0.294, and 0.341 of OCI, EEI, TAI, and CCI on SPE, respectively, indicating moderate to strong effect (Parida et al., 2019).

Direct Relationships

Path coefficients, t -statistics, and p -values were used to test the direct relationships (H1-H4) and were bootstrapped to provide a guarantee of the strength of the estimates made (Table 6).

Table 6. Structural Equation Model Direct Relation Results

Relationship	Original Sample	Sample Mean	Standard Deviation	t-Statistics	p-value
OCI → SPE	0.398	0.401	0.059	6.746	0
EEI → SPE	0.415	0.418	0.062	6.694	0
TAI → SPE	0.387	0.390	0.057	6.789	0
CCI → SPE	0.429	0.432	0.060	7.150	0

Note: t -statistics = 7.150; p -value = probability value.

Source: compiled by the authors.

The analysis proved that all the direct relationships are significant. Table 6 reports that Hypothesis 1 is sustained, establishing that H1: OCI is positively correlated with SPE ($r = 0.398$, $t = 6.746$, $p < 0.000$). H2: A positive relationship exists between EEI and SPE (beta = 0.415, $t = 6.694$, $p = 0.000$), and it is supported. H3: The positive relationship between SPE (beta = 0.387, $t = 6.789$, $p = 0.000$) and the adoption and integration

of technology is established and supported. H4: The CCI is positively associated with SPE (beta = 0.429, $t = 7.150$, $p = 0.000$), and the hypothesis is upheld.

Predictive Relevance

Using the blindfolding procedures, the Q^2 value was determined in evaluating the predictive relevance of the model. As stated by Parida et al. (2019), small, medium, and large predictive relevance are 0.02, 0.15, and 0.35 in Q^2 , respectively (Table 7).

Table 7. Predictive Relevance (Q^2)

Endogenous Construct	Q^2
Sustainable Performance Excellence (SPE)	0.405

Source: compiled by the authors.

According to Table 7, the Q^2 value of sustainable performance excellence (0.405) depicts large predictive relevance and affirms the predictive accuracy of the models.

DISCUSSION

In this research, the effect of innovative practices, including OCI, EEI, TAI, and CCI, on sustainable performance excellence in the Pakistani telecom industry was determined. The findings provide strong evidence supporting postulated relations and offer considerable insights into theory and practice in strategic management.

These results support the hypotheses that OCI (H1), EEI (H2), TAI (H3), and CCI (H4) all show significant positive correlations with sustainable performance excellence, establishing path coefficients of 0.398, 0.415, 0.387, and 0.429, respectively (Table 6). These findings are congruent with those of previous studies, such as Kopertyńska and Kmiotek (2015), which indicate the importance of a culture that promotes innovation in organizational performance.

Excellence in the telecommunications sector requires flexibility and innovative thinking; a powerful organizational culture of innovation will enable growth in this area. Equally, employee engagement in innovation, promoted by Kopertyńska and Kmiotek (2015), increases the commitment of employees towards innovative practices, which has a direct influence on the performance result.

The significant influence of technology adoption and integration (H3) supports the work of Aboramadan et al. (2019), which indicates that the proper integration of technologies, such as 5G and AI, in the Pakistani telecom market enables efficient operation and a competitive advantage. Customer-centric innovation (H4) highlights the largest impact, as it affects performance in the long term, in accordance with Muchtadin and Sundry (2023), because of the prioritization of customer needs through innovative services and products, which develop long-term performance excellence. It is specifically applicable in the Pakistani telecommunication market, where firms such as Huawei and Xiaomi, as well as amalgamating companies, are contending vehemently to fulfill the changing needs of customers.

These findings are especially relevant in the backdrop of the current global telecom sector, particularly the Pakistani telecom industry, which is characterized by rapid technological advancements and intense competition. This study, however, differs from those conducted in the West, as it involves comparing the dynamics of a developing yet technologically advanced market (Levy et al., 2022). Both the high R^2 value (0.682 SPE) and the large Q^2 value (0.405) show that the models have strong explanatory and predictive ability, thus supporting their appropriateness to the telecom industry as well.

CONCLUSIONS

This paper supports the argument that OCI, EEI, TAI, and CCI are key success factors of sustainable performance excellence in the telecom sector of Pakistan. Employing a quantitative methodology by using partial least squares structural equation modeling (PLS-SEM), the study yields strong empirical evidence that these new strategies generate cumulatively 68.2 percent of the overall variance in sustainable performance ($R^2 = 0.682$), including significant path coefficients that range between 0.387 and 0.429 ($p = 0.000$). The findings can serve as evidence-based strategies for leaders in the telecommunications industry to drive innovation and provide policymakers with ideas that can contribute to the industry's development. The study suggests that longitudinal and cross-industry research would be more generalized, as the study was conducted in only one industry. Strategies to achieve sustainable and continued competitive performance in a changing market should be differentiated. The main findings of the paper have been listed in point-wise form as below:

- OCI is a powerful tool that raises sustainable performance levels due to increased adaptability and innovativeness among telecom companies.

- EEI is a balanced and strong forecaster of long-term performance, which drives innovation and motivates engaged workers.
- The performance of TAI, such as 5G and AI, also has a positive influence and enhances efficiency and the ability to innovate.
- CCI also has the greatest impact on sustainable performance, and the focus should be on customer-driven innovation.
- The synergetic interactions of OCI, EEI, TAI, and CCI are proven to be valid through PLS-SEM by establishing the influence they all have on performance excellence.
- The primary items that telecom executives should focus on are developing a creative organizational culture that will make them more resilient and competitive.
- Companies should invest in the training and engagement of employees to continue with innovative performance results.
- The purposeful integration of new technologies, including 6G and AI, should be valued to keep the competitive position.
- Development policies ought to encourage the use and innovation of technology in telecommunication.
- It is important to note that customer-centric strategies, such as feedback platforms, and CRM applications, are fundamental in the alignment of innovations with market needs.
- In future studies, longitudinal research is recommended to determine the long-term effects of this kind of strategy on performance.
- A cross-industry and cross-country analysis would be recommended to make findings more generalizable in other emerging markets.

Limitations

Although this research is exhaustive in the study of the interaction (relationship) of OCI, EEI, TAI, and CCI in the Pakistani telecom industry, it has a few shortcomings. For the first consideration, the study focuses on the Pakistani telecom industry, which can serve as a scaling factor to disseminate the research outcomes to other markets or industries with similar cross-cultural, regulatory, or other market characteristics. The maturity of telecom development in Pakistan, as well as the state influence and the speed of 5G implementation, might not be supportive of the world telecom context. Second, the paper is based on existing literature and theories, which may not necessarily reflect recent changes in technology on a broad level, especially those related to the telecom industry, including emerging 6G technologies or the use of artificial intelligence innovations.

Third, the extent of data gathering may be limited by the right to know proprietary data of Pakistani telecom companies, which can restrict the level of empirical knowledge about organizational practices. Lastly, the emphasis of the study on the four particular constructs (OCI, EEI, TAI, and CCI) might fail to consider other aspects such as leadership styles, external partnerships, and others that may impact sustainability performance excellence.

Future Directions

These limitations can be addressed in the future through a broader scope and context of the study. First, the generalizability of the findings can be increased through cross-sectional comparative studies conducted across various industries or countries, where the interaction of OCI, EEI, TAI, and CCI can be studied in different contexts, such as the telecom industries of Western or developing economies. Second, the research should be conducted over a long period to understand how these constructs impact sustainable performance excellence as new technologies, such as 6G or advanced AI analytics, transform the Pakistani telecommunication industry. Third, in the future, primary data collection (interviews, surveys) should be conducted among Pakistani telecom executives and employees to gain insight into how to practically implement the new strategies.

Lastly, examining factors such as leadership styles and strategic partnerships with international technological companies may provide a more comprehensive picture of the aspects that influence sustainable performance within the Pakistani telecom industry. The advancements of this study based on these directions would add to the development of knowledge on new strategic management in terms of long-term excellence.

Author Contributions:

Conceptualization: A. S. A. S., M. R. A., M. V., Ch. X., R. M.; data curation: A. S. A. S., R. M.; methodology: A. S. A. S., M. R. A., M. V.; software: A. S. A. S.; validation: A. S. A. S., M. V.; formal analysis: A. S. A. S.; investigation: A. S. A. S., R. M.; resources: A. S. A. S., M. R. A.; writing – original draft

preparation: A. S. A. S., M. R. A., M. V., Ch. X., R. M.; writing – review and editing: A. S. A. S., M. R. A., M. V., Ch. X., R. M.; visualization: A. S. A. S.; supervision: M. R. A., M. V.; project administration: A. S. A. S.; funding acquisition: n/a.

Conflicts of Interest

The authors declare the absence of any potential or actual conflict of interest.

Data Availability

Not applicable.

Informed Consent

Ethical approval has been obtained from the Tashkent State University of Oriental Studies, Uzbekistan.

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APPENDIX

Charting the Future: Analyzing Innovative Strategies in Strategic Management for Sustainable Performance Excellence and Business Leadership in the Telecom Industry

Information about scale

All the items are provided by specific Likert Scales as follows:

- EEI, CCI, and TAI: (7-point): (1 = Strongly Disagree, 7 = Strongly Agree)
- OCI: (5-point): (1 = Strongly Disagree, 5 = Strongly Agree)
- SPE scale (5-point): (1 = Much Worse, 5 = Much Better)

A. Sustainable Performance Excellence (SPE) Green et al. (2012) demonstrates the level of accomplishment of the following by the organization within the past three years.

1. Growth in market share
2. Growth in sales
3. Growth in return on investment
4. Growth in profit
5. Improvement in overall competitive position
6. Improvement in customer satisfaction
7. Improvement in product quality
8. Improvement in on-time deliveries

B. Employee Engagement in Innovation (EEI) (Kwon & Kim, 2019; Schaufeli & Bakker, 2003; Hogan & Coote, 2014) *On the level of the agreement with the following statements, please indicate the extent of agreement.*

1. I am enthusiastic about my job.
2. My job inspires me.
3. I am proud of the work that I do.
4. I get carried away when I am working.
5. At my work, I always persevere, even when things do not go well.
6. I always try to invent new ways of improving the service quality.
7. I always try out innovative ideas at my work.
8. I seek out novel ways to tackle problems.
9. I adopt the latest technology in the industry.
10. I can decide how to go about getting my job done.

C. Organizational Culture of Innovation (OCI) (Alguezaui & Filieri, 2014)

Please specify how much each statement characterizes your organization.

1. Management actively seeks innovative ideas.
2. Innovation is readily accepted in the organization.
3. Management encourages employees to take risks.
4. People are rewarded for being innovative.
5. Management is willing to take risks to capture new opportunities.
6. Our organization has a culture that supports entrepreneurial thinking.
7. Our company emphasizes innovation and creativity.

D. Customer-Centric Innovation (CCI) (Cao, 2022). *Please answer the following statements to indicate the level of your agreement with them.*

1. Our company constantly evaluates the performance of customer participation in new product development (NPD).
2. We always encourage customers to actively participate in the NPD process.
3. Customers are often considered as a vital source of ideas for NPD.
4. Our customers are often involved in the NPD process (development and testing of new products).
5. We pay close attention to after-sales service and customers' comments on product improvements.

E. Technology Adoption and Integration (TAI) (Davis, 1989). *Please specify the degree of agreement with the use of customer-centric innovation technology in your work.*

Perceived Usefulness

Using this technology would improve my ability to develop customer-focused solutions. This technology would make it easier to incorporate customer feedback into our innovation process. I would find this technology useful for co-creating value with customers. Perceived Ease of Use4. Learning to use this technology for customer collaboration would be easy for me. I would find this technology easy to use in daily customer interaction tasks. My interaction with this technology for gathering customer insights would be clear and understandable.