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SOCIAL FACTORS INFLUENCING THE INNOVATION CLIMATE IN ENTERPRISES

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Purpose: The identification and evaluation of the social circumstances of the innovative climate in enterprises of the innovative sector, particularly with regard to the role of department heads in terms of its formation, while also the significance of the level of involvement of employees in the level of innovative climate.
Design/methodology/approach: The data was collected within the framework of a nationwide research project with the use of the method of a phone interview aided by computer techniques (CATI) conducted on 575 employees of the pharmaceutical, energy, automotive and IT sectors. The research encompassed the evaluation of the components of the innovative climate, while also the impact of managerial leadership and level of involvement of employees.
Findings: Research findings have indicated that the innovative climate is relatively high, while a key role is played by the department heads by way of strengthening the vision, motivating the team and supporting cooperation. The dependency between the innovative climate and the level of involvement by the employees is intricate and intensive innovative practices may reduce the feeling of participation in some areas. The findings emphasize the need to balance the innovative requirements with adequate organizational support with the aim of long term strengthening of the innovative potential.
Research limitations/implications: The limitation of the research is connected with its cross-sectional nature which does not allow for an unambigious conclusion relating to the cause-effect relationship between the innovative climate, the role of department heads and the level of involvement of employees. The findings are based on the declarations of respondents, which may be associated with subjectivity in terms of the evaluation, while also the risk of error in the joint method of measurement.
Practical implications: The research findings indicate the necessity to strengthen the role of department heads as leaders of change, while also develop the communication and mentoring competences, as well as supporting the autonomy of employees.
Social implications: The research illustrates that the development of the innovative climate based on supporting leadership and involvement strengthens the adaptive abilities with regard to dynamic change within the organization.
Originality/value: The originality of the research involves an intricate notion of the social circumstances of the innovative climate by means of the simultaneous role of department heads, while also engaging the employees in enterprises of the innovative sectors. Such an approach brings cognitive value by integrating the leadership perspective, team relations and motivating mechanisms in one analytical model.
Keywords: innovative climate, organizational involvement, manager, enterprise.
Category of the paper: Research article.

1. Introduction

Innovativeness is becoming a key factor in terms of competitive advantage and long-term development of the organization. However, the level of innovativeness does not entirely depend on the technical or financial resources, but to a large extent on the social factors in existence in the organization. One of these is the organizational culture based on innovative behaviour that favours openness, freedom of activity, execution of new ideas, tolerating risk or openness to changes that are essential to develop the innovative behaviour of the employees. Part of the organizational culture is that of the innovative climate, which is seen as the perception by the employees of an environment that favours creativity, experimentation and implementation of new ideas.

Although the concept of innovative climate has been widely discussed, it is often analysed as an outcome rather than as a phenomenon shaped by everyday interactions between employees and managers. Similarly, although employee engagement is commonly associated with job performance and commitment, its role in shaping the innovative climate remains insufficiently explored. Moreover, research on leadership and innovation has mainly focused on top management, while the influence of department heads and middle-level managers on shaping the innovative climate has received less attention.

This study addresses these gaps by integrating three perspectives: innovative climate, employee engagement, and the role of department heads in shaping the social conditions of innovation**.** By focusing on enterprises operating in innovative sectors, the research contributes to a better understanding of how social and organizational factors interact to support innovative behaviour and the development of new ideas.

Therefore, the research objective was formulated as the identification and evaluation of the social determinants of the innovative climate in enterprises operating in innovative sectors, with particular emphasis on the role of department heads in shaping it and the significance of employee engagement for the level of innovative climate.

On the basis of the adopted research aim, the following three questions were formulated: To what extent does the innovative climate exist in enterprises of innovative sectors? To what extent do department heads exert influence on the innovative climate? To what extent does the level of involvement of the employees have an impact on the innovative climate?

2. Innovative climate in organizations

Modern-day organizations function in conditions of dynamic technological, social and market changes that force the constant search for new solutions, while also the enhancement of ways of conducting activities. Innovativeness is therefore becoming not only the source of competitive advantage, but also the condition for long-term development and the survival of the organization. A key role in this process is played by the working environment which may both stimulate and hinder the creative activity of the employees. Organizational culture is of particular significance here, while also the innovative climate formed within its framework that determines the level of involvement, creativity and readiness to undertake innovative initiatives.

The climate of innovation is a type of strategic organizational climate. It may be described as the combination of the environment of the organization as perceived by the employees, which supports risky behaviour, while also allocating a sufficient amount of resources and promoting a competitive environment that favours innovations at work (Malibari, Bajaba, 2022). The innovative climate is associated with the performance of the organization, such as the better implementation of ideas, greater innovativeness and also general benefits, e.g. the level of satisfaction of the employees (Aarons, Sommerfeld, 2012).

The innovative climate in an organization brings multiple benefits. A favourable organizational climate has a direct positive impact on the innovative behaviour of the employees, while also an indirect impact by way of engaging the team and work itself, while simultaneously the indirect effect is stronger than the direct effect (Song, Inmor, Cuijten, 2024). Its significance results from the fact that it supports undertaking innovative initiatives and promotes highly valued ideas at each level of management (Puni, Hilton, Mohammed, Korankye, 2022). This creates a friendly environment that facilitates undertaking calculated risks, constant learning, while also effective implementation of innovations (Do et al., 2022) and influence on the creative behaviour of the employees (Pham, Le, 2024), as well as stimulating the organizational innovativeness (Le et al., 2024).

The level of the innovative climate in an organization depends on a multitude of factors. Newman, Round, Wang, Mount (2020), split them into individual ones associated with employees, namely, experience, education, skills, demographic data and the level of stress, while also organizational ones, namely, openness, autonomy, organizational support, practices of human resources management and transformational leadership.

A significant individual factor is that of the level of involvement of the employees, which is defined as the state of complete self-activation and mechanism of transforming incentives into the attitudes and behaviour desired by the organization (Schneider et al., 2018). The research conducted by Lin (2016) confirmed the positive correlation between the innovative climate and the organizational involvement. The latest research illustrates that organizational involvement is an important indicator of innovative behaviour and work efficiency (Park, Hwang, 2015). Furthermore, it is the basis for the positive attitudes amongst the employees with regard to their work and is a key determinant of the innovative activities

(Zeng, Song, 2025). Sanamthong and Prabyai (2023) illustrated that a highly involved workforce is more likely to actively discover new ideas and methods with the aim of solving organizational problems.

The organizational factor that has an impact on the innovative climate is that of leadership. Research shows that the activities of managers shape the innovative climate in an organization (Lecic et al., 2023). What is particularly important is the creative leadership abilities that have a positive impact on the innovative behaviour of the employees (Ye, Liu, Tan (2022). One of the types of leadership that strengthens the innovative climate is that of the transformative leadership, which, amongst other things, increases the level of enthusiasm of the employees with regard to innovations, which in turn favours the development of innovativeness. Research has shown that individual and concentrated transformative leadership has a positive impact on the innovative behaviour of the employees, while the identification with the leader fulfils a significant intermediary role in this process. The innovative climate of the team also moderates the relation between the identification with the leader and the individual innovative behaviour, by emphasizing its role as the condition that favours the generation and implementation of new ideas (Wang, Park, Kim, 2025). Transformative leaders have an impact on the organizational innovations by way of implementing new ideas, defining aims and encouraging employees to have initiatives, integrating creativity, resilience, energy and knowledge with the aim of increasing both the quality of products, as well as the processes (Kartono et al., 2021).

In sum, innovativeness in organizations is not the result of random activities, but the effect of consciously shaped working culture and climate. The involvement of employees and inspiring leadership create an environment in which ideas may be developed, while innovations may be implemented. The creation of such a climate is thus becoming a key element in terms of building competitive advantage and long term development of the organization.

Although organizational innovativeness has been widely studied, less attention has been paid to the social determinants of the innovative climate in organizations. Previous research has mainly focused on technological resources and strategic factors, while the role of social mechanisms shaping the innovative work environment remains insufficiently explored. This study addresses this gap by integrating three perspectives: innovative climate, employee engagement, and the role of department heads in shaping the social conditions of innovation. By focusing on enterprises operating in innovative sectors, the study contributes to a better understanding of how social and organizational factors support innovative behaviour and the development of new ideas.

The originality of the theoretical section lies in integrating research on innovative climate with employee engagement and leadership, emphasizing the social determinants of organizational innovativeness and linking them with the specific context of enterprises operating in innovative sectors.

3. Research methods

The CATI survey method (Computer Assisted Telephone Interview) was applied in the research and the research tool was a standardized survey questionnaire. The research was of a nationwide nature and the subject matter of research was that of companies employing over 50 people. On the basis of random selection, a research sample consisting of 575 employees working in enterprises of the innovative sectors was built, namely in sectors such as pharmaceutical (25.2%), energy (23.3%), automotive (26.4%) and IT (25%) (Bylok, 2024).

For the purpose of analysing the innovative climate and the factors that have an impact on its level in enterprises of the innovative sectors, research tools were created on the basis of the existing subject-related literature. All the scales were measured with the aid of multi-elemental reflective scales by availing of a five-level Likert scale (1 = I totally disagree, 5 = I totally agree).

4. Research findings

In an enterprise geared towards the creation of innovations, the factor which favours their formation is that of the climate of innovativeness which supports, amongst other things, openness to new concepts, new ideas, while also the creation and sharing of knowledge. With the aim of defining its level, a scale was applied that consists of 18 statements built on the basis of a modified version of the Krot and Lewickiej scale (2016). The results indicate a clearly positive evaluation of innovative culture in the organization under analysis (Table 1). The highest indicators in terms of responses were observed in the area of strategic circumstances and the significance of innovations in the organization (75% of evaluation were high or very high), particularly in the case of the existence of cohesive aims of development of innovative undertakings and the ease of access to information relating to the mission and principles of innovation. This certifies to the strong embeddedness of innovativeness in the strategies of an organization, while also effective communication with regard to its significance.

The high values in terms of the responses were also observed in the case of innovative leadership and managerial support (75% of high indicators), particularly with regard to accepting risk associated with innovations and support for employees who search for new solutions. These results indicate a favourable leadership climate.

A significant element of the innovative climate is that of innovative and entrepreneurial competences (74% of high indicators). The highest indicators of positive responses were noted in the following areas: expectation of enhancement of skills and increasing knowledge, expectation of creativity, as well as innovatory activities, while also granting aid to employees

from other departments. This indicates that the organization is not only declaring the significance of innovation, but also promoting the development of competences and active attitudes of employees as the condition for the execution of this.

In the case of the element of organizational cooperation and flow of knowledge, slightly lower results were attained (71% of high indicators), albeit they are still high indicators, particularly relating to the creation of conditions for cooperation between departments, while also the utilization of the creativity of employees with the aim of achieving a profit and the opportunity to use untypical solutions in everyday work. The greater share of the neutral responses to these questions may suggest that the practical dimension of cooperation and creative freedom is less explicitly assessed than strategic declarations.

In the case of attitudes relating to risk and errors in innovative activities (71% of high indicators), a relatively higher acceptance of risk associated with innovations than the adherence to innovative processes was observed in the context of the possibilities of errors, which signifies openness to potential risk.

In the area of the element of barriers and tension in innovative culture, the percentage of positive responses is still high (64% of high indicators), yet they are the lowest values of the whole set of data. This may indicate the existence of operating pressure, while also certain interpersonal tension, which could potentially hinder full use of the innovative potential.

Hence, it is possible to conclude that employees in most cases perceive the working environment as being favourable to innovations.

Table 1.
Indicators of innovative climate in percentage form

Dimension	Indicator	Type of answer		
		1+2	3	4+5
ICS Strategic conditioning and significance of innovations in an organization	ICS1 Ease of access to information, (mission, aims, principles relating to innovation)	1,2	24,2	74,6
	ICS2 Existence of cohesive aims of development of innovative undertakings	5,2	19,1	75,6
	ICS3 Conviction that innovations are key values	3,8	21,7	74,4
	ICS4 Open communication with employees about expectations regarding innovativeness on part of managers	2,8	21,4	75,8
	ICS5 Encouragement of department heads by their superiors to take risks and take opportunities to develop the company	3,8	21,4	74,7
ILM Innovative leadership and managerial support	ILM1 Accceptance by department heads of new ideas proposed by employees	5,4	19,7	75
	ILM2 Support of employees in search of novel solutions	0	22,8	77,2
	ILM3 Aid for managers in breaking barriers for implementing innovations	0	28,2	71,8
	ILMI4 Large scale autonomy for project head	0	20,3	73,4
	ILM5 Granting aid to employees from different departments in creation of innovations	1,4	20	78,6
	ILM6 Organizational acknowledgement of employees that create new solutions	4,0	20	76

Cont. table 1.

IEC Innovative and entrepreneurial competences	IEC1 Expectation of enhancement of skills and increase in knowledge	2,4	19	78.6
	IEC2 Expectation of creativity and novel activity	1,2	20,2	78,6
	IEC3 Expectation of initiative at work	4,0	27,1	68,9
	IEC4 Expectation of flexibility and rapid adaptation to change	1,4	28,2	70,4
	IEC5 Encouragement to accept challenges brings benefits	3,8	21,6	74,6
	IEC6 Skill of transforming ideas into profitable undertakings	2,6	20,2	77,2
OCK Organizational cooperation and knowledge flow	OCK1 Easy access to information and knowledge	2,6	20,2	77,2
	OCK2 Creation of conditions for cooperation between sections/departments	1,4	29,6	69.1
	OCK3 Availing of suggestions of clients in enhancing products	3,7	24,3	72
	OCK4 Identification of individual contribution of employees in innovative projects	9,2	23	68
	OCK5 Utilizing creativity of employees in generating economic value	5	28,5	66,4
ARM Attitudes towards risk and mistakes in innovative activities	ARM1 Perception of innovative processes as being connected with risk and possibility of mistakes	5,2	25,9	68,9
	ARM2 Acceptance of risk associated with innovations	1,2	23,8	75
BIC Barriers and tension in innovative culture	BIC1 Excessive burden of current tasks that limit level of involvement in innovative activities	9,2	28,5	62,3
	BIC2 Existence of envy towards success of co-workers	8	24	68,2
	BIC3 Restricted freedom to express non-standard solutions	2,6	34,1	63,4

Scale: 1- I totally disagree, 2 – I disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 - I totally agree.

Source: Self-analysis.

Department heads have an impact on the level of the innovative climate. Analysis of the distribution of responses indicates a very high level of evaluation of the role of the department heads in terms of building the innovative climate (Table 2). One of the factors in building the innovative climate is that of strategic leadership and the vision of the development of the enterprise (78.9% of high indicators). The lowest indicators were attained with relation to decision making on the basis of principles and values, while also the perception of conflict as a constructive phenomenon, as well as the formation of an organization by means of a vision and its translation into strategies.

A further factor is that of the motivating and strengthening of employees (77.1% of high indicators). Public appreciation of creative efforts and implementation of systems of rewards strengthen the motivation of the team towards the further search for new solutions. Very high indicators were noted for statements relating to the motivating role of department heads and gaining potential from employees by means of strengthening them in the execution of tasks, while also building and maintaining good relations with subordinates.

An important factor as an element of the innovative climate is the inclusion of differentiation and organizational values (77.2% of high indicators) which involves translating declarations into specific systems and behaviour that create the culture of belonging.

Another equally important factor stimulating the innovative climate is that of the communicative competences of the department head (73.2% of high indicators). These high values, albeit lower than in the previous areas, were noted in the sphere of interpersonal communication as a factor that arouses effectiveness, the skill of listening to and calming others, while also searching for and utilizing feedback.

Table 2.
Role of department heads in development of innovative climate in percentage form

Dimension	Indicator	Type of answer		
		1+2	3	4+5
SLV Strategic leadership and vision	SLV1- taking decisions on basis of principles and values	1,2	24,2	74,6
	SLV2 – perceiving conflict as constructive phenomenon	5,2	19,1	75,6
	SLV3 – ability to form organization by way of vision and translate to strategies	3,8	1,2	74,4
	SLV4 – implementing changes in the firm	2,8	21,4	75,8
MSE Motivating and strengthening employees	MSE1 – motivating employees and gaining potential from them	3,8	21,4	74,7
	MSE2 – strengthening employees in terms of execution of tasks	5,4	19,7	75
	MSE3 – building and maintaining good relations with subordinates	0	22,8	77,2
	MSE4 – conviction of necessity to implement innovations by department head	0	28,2	71,8
CIC Communication and interpersonal competences	CIC1 - interpersonal communication as factor that arouses effectiveness	0	20,3	73,4
	CIC2 – searching for and using feedback	1,4	20	78,6
	CIC3 – skill of listening to and calming others	4,0	20	76
IDOV Including differentiation and organizational values	IDOV1 – respect for values and differentiation	2,4	19	78.6

Scale: 1 – I totally disagree, 2 – I disagree, 3 – I neither agree nor disagree, 4 – I agree, 5 – I totally agree.

Source: Self-analysis.

In the subsequent step in research, the relations between the indicators of the innovative climate and the role of a department head in its development were analysed. In Table 3 Spearman's Correlation Coefficient has been presented with regard to the particular indicators of the innovative climate (ICS, ILM, IEC, OCK, ARM, BIC) and the various roles of department heads (SLV1-SLV4, MSE1-MSE4, CIC1-CIC3, IDOV1). The detailed analysis of relations indicates that ICS2 illustrates high correlations with SLV2 and MSE4. Likewise, IEC6 has very strong correlations with SLV4 and IDOV1 and CIC3. In turn, OLK2 is strongly associated with SLV4 and moderately so with IDOV1. However, ILM2 displays high correlations with MSE4 and IDOV1.

Simultaneously, multiple indicators of the innovative climate, e.g. IEC2, ARM1, OCK1, BIC2, illustrate very low correlations (<0,15) with the majority of the roles of department heads. This indicates that not all the elements of the innovative climate are strongly dependent on the activities of department heads as some of them may be determined by other factors, e.g. individual attitudes of employees or organizational structure.

Table 3.
Spearman's Correlation Coefficient between innovative climate (ICS, ILM, IEC, OLK, ARM, BIC) and roles of department heads (SLV, MSE, CIC, IDOV)

	SLV1	SLV2	SLV3	SLV4	MSE1	MSE2	MSE3	MSE4	CIC1	CIC2	CIC3	IDOV
ICS1		0,511		0,553				0,585		0,416	0,554	0,506
ICS2		0,627		0,466				0,576		0,313	0,542	0,365
ICS4	0,089		0,117	0,099		0,083		0,541		0,115	0,094	
ICS5		0,126	0,113									
ILM1					0,103			0,422		0,399	0,642	
ILM2			0,093					0,563	0,101			0,625
ILM3			0,094					0,500	0,455	0,295	0,576	0,480
ILM4									0,402			0,345
ILM5		0,087								0,473		
ILM6		0,087						0,604			0,490	0,464
IEC1	0,134	0,367		0,502		0103	0,507	0,507	0,108	0,362	0,381	
IEC2			0,110	0,113								
IEC4		0,267	0	0,329				0,449		0,407		0,372
IEC5			0,104								0,356	
IEC6		0,511	0,110	0,669				0,462		0,443	0,565	0,535
OCK1	0,130		0,158						0,142			
OCK2		0,414		0,605				0,394		0,324		0,582
OCK3		0,157		0,161		0,104	0,159	0,128	0,142	0,082	0,161	0,142
OCK4	0,096	0,497		0,556				0,558		0,426	0,523	0,450
OCK5	0,152	0,430		0,565	0,104			0,558	0,110	0,403	0,313	0,431
ARM1	0,146		0,112	0,113	0,095				0,097			
ARM2	0,097	0,470		0,626				0,514		0,484	0,589	0,593
BIC1			0,102	0,111								
BIC2				0,115								
BIC3			0,107		0,087	0,094			0,086			0,082

$p > 0,01$.

Source: Self-analysis.

The social factor that has an impact on the level of innovativeness of the employees is their level of involvement. The highest level of involvement relates to task support, namely, support for other employees despite the heavy workload, passing on useful information and interest in problems of other employees at the workplace.

The involvement of employees in everyday work and in replacing other employees was assessed at a lower rate, particularly in the case of voluntary support for co-workers in the workplace and replacing other employees during their absence in spite of conducting their own work duties.

The involvement of employees in terms of emotional and developmental support was rated at the lowest level, namely, devoting time to listening to the problems of employees and devoting time to teaching other employees.

Table 4.
Degree of involvement of employees in a team within last month in percentage form

Dimension	Indicator	Type of answer		
		1+2	3	4+5
TS Task support	TS1- aid in situations of great burden	7,8	39,3	52,9
	TS2 – passing on useful information	7,8	39,3	52,9
	TS3 – showing interest in problems of co-workers	25,4	28,0	46,6
	ESR1 – voluntary aid	10,3	60,9	28,8
	ESR2 – replacing absent workers	14,8	51,5	33,7

Cont. table 4.

EDS Emotional and developmental support	EDS1 – devoting time to listening to problems	33,2	51,7	15,1
	EDS2 – support in teaching other employees	29,6	50,6	19,8

Source: Self-analysis.

Scale: 5 – very large, 4 – large, 3 – moderate, 2 – sligh, 1 – lack of involvement.

From the perspective of the research aim, it would seem to be significant to analyse the relations between the indicators of the innovative climate and the level of involvement of the employees. Analysis of Table 4 indicates that the majority of indicators of the innovative climate (ICS, ILM, IEC, OCK, ARM, BIC) indicate a negative relation with the particular dimensions of involvement. The strongest negative correlation occurred between ILM6 and TS2, which indicates the relatively strong inverse correlation between the indicator of the innovative climate and the dimension of the level of involvement of passing on useful information. Apart from this, moderate correlations occurred between ILM2 - TS2, ILM3 - TS2, IEC4 - TS2 and ARM2 - TS2. Only individual indicators (ICS2, ILM3, IEC6, OLK2, ARM2) have a slightly positive correlation, which is so weak that it is difficult to refer to it as a significantly positive relation. The findings suggest that in certain circumstances a high emphasis on innovations may be connected with the reduction of subjective involvement, e.g. due to increased levels of stress or innovative pressure.

Table 5.
Spearman's Correlation Coefficient between innovative climate (KI) and level of involvement of employees (PZ)

	TS2	**TS3**	**ESR1**	**ESR1**	**EDS2**
ICS1	-0,395	-0,116			-0,114
ICS2	-0,412	-0,141		0,104	
ICS3	-0,093	-0,087			
ILM1	-0,345	-0,250		-0,097	
ILM2	-0,492	-0,297			-0,108
ILM3	-0,452	-0,159		0,095	
ILM4	-0,369	-0,356			-0,109
ILMI6	-0,514	-0,283			-0,105
IEC1	-0,384	-0,219			-0,138
IEC4	-0,444	-0,385			-0,147
IEC6	-0,364	-0,158		0,097	
OLK2	-0,340	-0,230		0,097	-0,123
OLK3	-0,120				
OLK4	-0,413	-0,204			
OLK5	-0,369	-0,132			-0,095
ARM1					-0,126
ARM2	-0,439	-0,224	0,102	0,102	-0,119
BIC2			-0,121	-0,091	

$p > 0,01$.

Source: Self-analysis.

5. Discussion and summary

In this paper social factors that determine the innovativeness of a firm have been analysed. The aim was not to clarify the final innovative performance of firms, but to identify and evaluate the social circumstances of the innovative climate in enterprises of the innovative sectors, particularly with regard to the role of department heads, while also the significance of employees in its formation. The findings of the research conducted facilitated acquiring the answers to the research questions formulated. The research indicates that in the analysed organizations the innovative climate is relatively highly rated, which confirms the presence of favourable cultural and organizational conditions in terms of the development of innovativeness. The most strongly emphasized area is that of the strategic dimension, while also the role of department heads, who by means of strengthening the vision, taking decisions on the basis of values, motivating employees and supporting cooperation have a significant impact on the formation of an environment that is favourable to creativity and the implementation of new solutions.

Analysis of the dependency between the indicators of the innovative climate and the level of involvement of the employees indicates a more intricate nature of these relations. The prevalent negative correlations suggest the intensification of innovative activities, particularly in conditions of organizational pressure may be associated with the reduction of the subjective feeling of involvement in its chosen dimensions. Simultaneously, the occurrence of weak positive dependencies confirms the fact that the appropriately managed innovative climate that is based on support, cooperation and exchange of knowledge may favour the motivation and initative of the employees.

Hence, the research findings facilitate the conclusion that the effective shaping of the innovative climate requires balancing the requirements associated with the execution of innovative aims with the adequate managerial support, development of interpersonal competences of department heads, while also strengthening the proactive and team forms of involvement. In particular, it would appear to be significant to develop the monitoring mechanisms, while also the culture of sharing knowledge and building relations based on trust and identification with the leader. Such an approach may lead to the more complete use of the innovative potential of the organization, while also ensuring long-lasting and balanced growth in conditions of a dynamic environment.

Despite the valuable insights provided by this study, several limitations should be acknowledged. First, the study is based on a cross-sectional research design, which limits the possibility of establishing clear causal relationships between the innovative climate, the role of department heads, and the level of employee engagement. Future studies could therefore adopt a longitudinal approach in order to better capture the dynamics of these relationships over time. Second, the study relies on self-reported data provided by respondents, which may involve

a certain degree of subjectivity. Future research could address this limitation by applying mixed methods**,** combining both quantitative and qualitative approaches. Third, the study focuses on selected innovative sectors (pharmaceutical, energy, automotive, and IT)**,** which may limit the generalizability of the findings to other industries. Further research could extend the analysis to other sectors or conduct comparative cross-sector studies to verify whether similar relationships occur in different organizational contexts. Finally, future research could further explore the mechanisms linking innovative climate, leadership, and employee engagement, for example by analysing the role of additional variables such as organizational culture, knowledge sharing, psychological safety, or organizational support for innovation. Such studies would contribute to a deeper understanding of the social and organizational processes shaping innovative climate and innovative behaviour in contemporary organizations**.**

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