Invisible Human Capital and Revealed Performance: An Essay on Participatory Innovation in a Constrained Context - The GL1/Z Case

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Abstract:

This paper examines the role of participatory innovation and intrapreneurship in enhancing organizational performance through a case study conducted in an Algerian industrial firm. By comparing two organizational configurations—outsourced maintenance handled by a foreign company and internalized maintenance performed by local engineers during crises such as the pandemic crisis; the study highlights the superior performance of the internal model in terms of cost efficiency, responsiveness, and operational effectiveness. The findings also reveal the presence of latent entrepreneurial potential within local teams, often underutilized due to insufficient recognition and incentive systems. This research contributes to the literature on intrapreneurship and participatory innovation in emerging economies and offers managerial and strategic implications for strengthening organizational sovereignty.

Keywords: Participatory innovation; intrapreneurship, organizational performance; technological dependence; latent human capital.

JEL Classification Codes: O31, O32, L23, L26, J24

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Introduction:

In a context marked by globalization, technological dependence, and rapid transformations in production systems, the economic environment is characterized by intensified competition and a persistent reliance on external expertise. Consequently, firms in emerging economies face a dual challenge:

- Mobilizing and leveraging their human capital as a source of sustainable innovation and organizational performance;
- Improving performance while strengthening their strategic autonomy.

In many developing economies, such as Algeria, organizations have historically relied on foreign service providers for critical functions such as industrial maintenance, reflecting a form of technological dependence often accompanied by knowledge retention. As a result, these outsourcing-based models "frequently entrusted to external expertise" have come at the expense of developing and valorizing internal resources.

However, certain force majeure situations have profoundly challenged these organizational choices. The global health crisis associated with the pandemic crisis acted as a revealing exogenous shock, disrupting international flows of expertise and forcing firms to rely, urgently, on their internal capabilities, thereby testing traditional organizational models. In this context, local teams were required to assume strategic functions, particularly in industrial maintenance, revealing levels of performance, adaptability, and innovation that often exceeded expectations.

This phenomenon is not new. During the period of security instability experienced by Algeria in the 1990s "marked by the Algerian Civil War"similar situations led to the withdrawal of certain foreign expertise, particularly Japanese specialists who had been responsible for the maintenance and monitoring of complex industrial equipment. Under these exceptional circumstances, teams of Algerian engineers took over, demonstrating a remarkable capacity to master technical maintenance, innovate in practice, and ensure operational continuity at significantly reduced costs (LARKECHE, 1990).

Other studies have contributed to a better understanding of the process of participatory innovation in companies within the Algerian context. For instance, a study conducted within the company EL WEJDEN highlighted the contribution of participatory innovation to the

creation of new offerings, which opened up new opportunities for the company (Merine & Rahali, 2021).

These empirical experiences converge toward a central finding: the existence of latent human capital—often invisible, underutilized, and insufficiently valued—largely due to organizational logics based on external dependence and the strategic retention of knowledge by foreign service providers. Despite contractual constraints limiting access to technical knowledge, these episodes have shown that internal capabilities, when mobilized under constrained conditions, can generate innovation dynamics driven by motivation, learning, and creative problem-solving (Ait atmane, 2022)

Thus, innovation cannot be reduced solely to external entrepreneurial dynamics, such as the creation of start-ups. It also emerges within established organizations through participatory innovation processes, including internal crowdsourcing and intrapreneurship, driven by individuals capable of transforming constraints into opportunities. From this perspective, (DURIEUX, 2000) argues that the development of human capital constitutes a fundamental strategic lever, representing an essential intangible production factor, alongside knowledge, organizational learning, and innovation capacity. From this point, a central question emerges:

General research question

How does the activation of latent human capital, through participatory innovation and intrapreneurship, influence organizational performance and cost reduction in firms, particularly in times of crisis?

Based on the theoretical framework and empirical observations, the following hypotheses are formulated:

H1: Intrapreneurship has a positive and significant effect on organizational performance.

H2: Crisis situations (e.g., pandemic crisis, the Algerian civil war) strengthen the relationship between intrapreneurship, organizational performance, and cost reduction.

In this context, the present study aims to analyze, through a case study of an Algerian company, how disruptive situations "whether sanitary or security-related" have revealed the entrepreneurial potential of internal teams, in comparison with an outsourced model. The objective is to demonstrate that the revalorization of human capital

constitutes a necessary condition for triggering sustainable innovation dynamics and strengthening organizational sovereignty.

Firstly -Literature Review

1. Entrepreneurship and Value Creation in Emerging Economies

Entrepreneurship is now considered a central pillar of economic growth and the structural transformation of economies, particularly in emerging contexts. In the Schumpeterian tradition advanced by Joseph Schumpeter, the entrepreneur is viewed as the agent of change, capable of recombining the factors of production to generate innovation and creative destruction. This perspective has been enriched by contemporary approaches that emphasize the role of entrepreneurship in job creation, economic diversification, and the enhancement of competitiveness (Schumpeter, 1934).

In resource-dependent economies such as Algeria, entrepreneurship is also seen as a strategic lever for reducing dependence on hydrocarbons. However, the literature points out that public policies have often prioritized business creation (start-ups) at the expense of valuing entrepreneurial capacities within existing organizations (Kuratko, Hornsby, & Covin, 2014).

2. Intrapreneurship as a Performance Lever

The concept of intrapreneurship, introduced by (Pinchot, 1985) refers to the ability of employees to adopt entrepreneurial behaviors within established organizations. It is part of an organizational transformation logic aimed at fostering innovation, initiative-taking, and value creation.

The work of (Burgelman, 1983) and (Antoncic & Hisrich, 2003) shows that intrapreneurship plays a key role in the strategic adaptation of firms by encouraging the emergence of new opportunities from internal resources. Similarly, (Kuratko D. , 2005) emphasizes that organizations promoting intrapreneurship benefit from a sustainable competitive advantage, particularly through better utilization of human capital.

In this context, intrapreneurship appears to be a relevant alternative to outsourced innovation models, especially in situations where companies seek to reduce their dependence on foreign expertise.

3. Participatory Innovation and the Mobilization of Collective Intelligence

John Bessant argues that participatory innovation is based on the active involvement of employees in continuous improvement processes and the creation of innovative solutions. Unlike traditional top-down models, it values tacit knowledge, often held by operational actors (Bessant, 2003).

According to the work of (Nonaka & Takeuchi, 1995), knowledge creation within organizations relies on dynamic interactions between tacit and explicit knowledge. This process, conceptualized through the SECI model, highlights the importance of socialization and knowledge-sharing mechanisms in generating innovation.

From this perspective, participatory innovation constitutes an essential lever for revealing hidden competencies and fostering organizational learning. It is particularly relevant in constrained environments, where external resources are limited (Bonnafous-Boucher, 2010).

4. Human Capital, Tacit Knowledge, and Organizational Performance:

Human capital is widely recognized as a key determinant of organizational performance. The work of (Becker, 1964)) laid the foundations of this approach by considering individuals' skills, knowledge, and capabilities as productive investments. Subsequently, (RONTEAU & DURAND, 2017) highlighted how organizations develop and cultivate their capabilities.

More recently, the literature has emphasized the tacit dimension of knowledge, which is difficult to transfer but essential for innovation. This form of knowledge, often accumulated through experience, constitutes a competitive advantage that is hard to imitate (Lièvre & Rix-Lièvre, 2012).

In the contexts studied, particularly during crisis situations, this latent human capital can be activated to compensate for the absence of external resources. This aligns with the concept of "dynamic capabilities" developed by (Teece, 2007), according to which organizations must be able to mobilize, reconfigure, and leverage their internal resources in order to adapt to environmental changes.

5. Technological Dependence and Knowledge Asymmetry

Dependence on external expertise can lead to situations of informational asymmetry, in which service providers hold a strategic advantage due to their control of technical knowledge. This situation

limits firms' ability to develop autonomy and internalize critical competencies. The resource dependence theory, developed by Jeffrey Pfeffer and Gerald Salancik, explains how organizations become dependent on their environment to access key resources. In the case of industrial maintenance, this dependence may be reinforced by knowledge-retention practices, thereby limiting opportunities for internal learning and constraining strategic autonomy (Pfeffer & Salancik, 1978).

However, disruptive situations, such as health or security crises, can temporarily reduce this dependence by forcing organizations to mobilize their internal resources.

6. Crises and Innovation: A Transformational Perspective

Crises represent moments of disruption that challenge organizational routines and open the way for new forms of innovation. In this regard, the crisis linked to COVID-19 has been widely studied as a catalyst for organizational innovation.

The work of the Organisation for Economic Co-operation and Development (OECD, 2020) and the (Word Bank, 2021) show that firms capable of mobilizing their internal resources were more resilient to external shocks.

In the Algerian context, crises—whether sanitary or security-related, particularly during the Algerian Civil War—have played a similar role by revealing unexpected internal capabilities. These episodes illustrate the role of constraints as triggers for innovation and organizational reconfiguration.

7. Toward an Integrative Framework: Latent Human Capital and Endogenous Innovation

The analysis of the literature makes it possible to propose an integrative framework structured around three dimensions:

- **Latent human capital:** invisible and underutilized skills
- **Participatory innovation:** a mechanism for collective mobilization
- **Intrapreneurship:** transformation of skills into value

This framework highlights that innovation is not limited to the creation of new firms but can also emerge within existing organizations, provided that organizational conditions encourage the expression of internal capabilities (Cheikh Naama & ABRAOUZ, 2023).

Secondly-Methodology

This article adopts a qualitative approach based on a comparative case study conducted within an Algerian industrial complex in the energy sector. It relies on the following elements: Two organizational configurations are analyzed:

- **Outsourced model (pre-COVID):**
  - Maintenance carried out by a foreign company
  - Limited access to technical processes
  - High costs
- **Internalized model (COVID period):**
  - Maintenance carried out by Algerian engineers
  - Process appropriation
  - Adaptive innovation

The data are based on:

- Internal observations
- Informal testimonies from stakeholders
- Comparative analysis of costs, timelines, and performance (internal data)
- Semi-structured interviews conducted with a sample of engineers, technical managers, and maintenance supervisors.

Type of Analysis

- Performance comparative analysis
- Cost analysis
- Organizational analysis

Thirdly – Case Study Context

Since 2014, Algeria has faced prolonged economic instability characterized by austerity policies driven by a structural crisis. This situation worsened in 2020 due to the combined effects of the COVID-19 pandemic, the collapse of oil prices, and governance-related disruptions (the repercussions of corruption scandals linked to the previous system) (Hadjene & Bakhtache, 2022).

In response, the government implemented rapid measures aimed at stabilizing the economy, including reducing dependence on foreign partnerships, promoting national competencies, and introducing fiscal support for businesses (Hadjene & Bakhtache, 2022).

A key illustration of this strategy is Sonatrach, which was required to cut its investments from $14 billion to $7 billion and cancel costly foreign service contracts estimated at $7 billion annually.

Additionally, declining oil prices (from $45 to $35 per barrel) and project suspensions led to a significant drop in export revenues—around 39%—falling from $32 billion in 2019 to approximately $20 billion in 2020 (The court of accounts , 2020).

1. Foreign Partnerships

Although the hydrocarbons sector has often faced several challenges "such as petroleum financing constraints, high exploration and pipeline costs, and a lack of advanced technologies" in order to stimulate the economy, Algeria turned to foreign partnerships, particularly in petrochemicals. A key example is the collaboration between Sonatrach and the American company Air Products and Chemicals Inc.. APCI, an international industrial group specializing in the production and transportation of industrial and medical gases, was founded in 1940 in Detroit (Michigan) by Leonard P. Pool. As of 08/05/2020, its market capitalization stood at USD 50.1 billion, with shareholders' equity of USD 11.4 billion as of 30/09/2019.

1.1. Contract Details of the Partnership

Within the framework of a specific contract (third branch), Sonatrach engaged APCI for the repair of the main heat exchanger 206-E-05.20 of train 200. Sonatrach acts as the client, while APCI acts as the service provider. APCI commits to having the required qualifications, expertise, specialized personnel, financial resources, and material means necessary for the execution of the contract. It agrees to the professional execution of the contract in accordance with all its terms, including the integrated annexes (based on internal company documents).

1.2. Contract Scope

- Repair of leaks in the client's main heat exchanger 206-E-05.20 of train 200
- Internal inspection of the main heat exchanger

- Execution of required tests to verify the quality of the repair
- Internal repair operations of the main heat exchanger
- Conducting all necessary tests to confirm the tightness of the heat exchanger tubes

APCI's Missions and Commitments

APCI guarantees a full intervention: diagnosis, leak repair, hydrostatic and functional testing, and recommissioning of a critical piece of equipment used in gas liquefaction (LNG). This partnership reflects Sonatrach's strategy of integrating foreign technologies in response to internal limitations.

2. Impact of the Pandemic on the Enhancement of Local Skills

Sonatrach—a national institution accustomed to contracting foreign companies, notably the American firm Air Products and Chemicals Inc. for the repair of main heat exchangers—faced entry restrictions imposed by the COVID-19 crisis and nationwide lockdown measures.

These constraints forced Sonatrach to adopt alternative solutions to ensure production continuity, with the most effective option being the mobilization of its internal engineering teams.

2.1. Between Successes and Challenges

Already in 2012, the management of the GL1/Z complex considered breaking away from the foreign partnership in favor of internal resources; however, this initiative remained theoretical and was never implemented. The same refit proposal re-emerged in 2018, but it failed to gain the approval or support of top management, in a context of continuously rising repair costs and production shutdowns that negatively affected the site's profitability. It was only with the outbreak of the pandemic that the national team was given a concrete opportunity: in August 2020, it successfully carried out the repair of train 600 in just 15 days, achieving a level of precision and quality standards comparable to those of the American delegation.

This performance attracted the attention of senior management and ultimately led to formal approval.
These operators, composed of a group of experienced experts who had worked for several years alongside the American team, were able—through careful observation and rapid learning—to demonstrate their competence despite multiple constraints.

2.2. Obstacles Faced by the National Team

In addition to the critical condition of the main heat exchanger, the national team had to overcome several structural barriers:

- Lack of trust and encouragement from senior management
- Insufficient resources allocated and limited opportunities to demonstrate capabilities
- Systematic comparisons with the American delegation
- Bureaucratic rigidity.

2.3. Reasons for Transitioning Away from the American Partnership at the GL1/Z Complex

Several factors led the GL1/Z complex to progressively reduce its reliance on the American partnership:

- Increasing repair costs of main heat exchangers
- Rising prices of materials
- COVID-19 pandemic-related restrictions
- Desire for autonomy from external dependence
- Government directives to rationalize public expenditure
- Production interruptions while waiting for the American team to arrive in the country
- Strict security protocols applied to foreign delegations

These factors prompted the institution to reassess its practices and explore endogenous alternatives.

3. Summary of Semi-Structured Interviews

In addition to internal observations and a comparative analysis of costs, timelines, and performance (internal data), an interview was conducted with a sample of engineers, technical staff, and maintenance managers from the GL1/Z complex (approximately six individuals), in order to understand the dynamics that led to the internalization of maintenance operations.

The analysis of responses reveals that the project primarily involved repairing the main heat exchange system by identifying and sealing internal leaks. Initially, this task was performed by a foreign partner;

however, the pandemic crisis acted as a major trigger for its internal takeover.

The shift toward internalization did not result from a top-down managerial decision, but rather from an autonomous initiative by local engineers, driven by a sense of saturation with external dependence and strong confidence in their own capabilities. Despite initial resistance and several organizational constraints, the team persisted until it demonstrated its ability to complete the work.

At the operational level, the results are particularly significant. The repair duration of an industrial train (train 600) was reduced to 15 days, compared to 25 days under the partnership with the foreign company. This performance improvement was also accompanied by operational continuity, as the equipment has not experienced any shutdown since its recommissioning.

In terms of costs and resources, the maintenance process reveals a major structural transformation. While outsourced operations relied entirely on imported inputs, internal teams progressively succeeded in localizing the production of spare parts, achieving near-industrial autonomy. Only one specific component (the Hand Hole) is still imported and is currently subject to local development initiatives.

Furthermore, the costs of outsourced repairs were extremely high, reaching approximately USD 1.2 million, whereas the internal approach enabled a substantial reduction in expenditures, notably through the elimination of ancillary costs (logistics, travel, accommodation, etc.).

Finally, a spillover effect at the organizational level is highlighted. The success of this experience led other industrial complexes, such as GL2/Z, to abandon foreign contracts in turn and adopt a similar approach based on internal capabilities.

4. Comparison Between External and Internal Service Provision

The American delegation and the Algerian delegation both achieved notable performance levels; however, significant differences emerge in terms of duration, costs, and spare parts sourcing. The comparative table below summarizes these differences, illustrating the superior efficiency and cost-effectiveness of the Algerian team in the repair of train 600, which was put back into service without failure or interruption, compared to the American team’s intervention on train 200.

Table 1 : Comparison of Costs and Duration of Services Provided by the Two Teams

Criteria	American Team	Algerian Team
Performance	Excellent	Excellent
Repair Duration	25 days	15 days
costs	Very high	Very low
Spare Parts	Imported from abroad in foreign currency	Locally manufactured at significantly lower costs

Source: Prepared by the author based on data collected within the company.

4.1. Performance Comparison

For several years, the American delegation was supervised by an Algerian team during its interventions on national territory for the repair of main heat exchangers. This close observation enabled the local team to acquire valuable expertise; combined with their accumulated skills and learning, they exceeded management expectations during the intervention on train 600, achieving a performance evaluation superior to that of the American team.

4.2. Comparison in Terms of Duration and Costs

The GL1/Z complex was accustomed to a standard repair duration of 25 days for main heat exchangers, generating substantial costs. The Algerian team reduced this timeframe to 15 days while simultaneously minimizing expenditures, thereby strengthening internal confidence and promoting a transition toward technical self-sufficiency.

Table 02: Comparison of Working Conditions Between the Two Teams

Comparison Criteria	Algerian Team	American Team
Remuneration	Regular monthly salary (on average between USD 17,000 and 25,000 per year)	Paid on a daily basis (generally between USD 100,000 and over 200,000 per year for experienced profiles
Overtime Work	Not included	
Accommodation Costs	Not included	High (5-star hotel accommodation)
Transportation Costs	Worker transport provided	High (private transport)
Escort Protocol	Gendarmerie /police escort	Not applicable

Source: Prepared by the author based on data collected within the company.

It is also observed that the American team received high salaries, to which were added transportation costs, accommodation in five-star hotels, and various additional expenditures. All these charges significantly increased the complex's budget over many years. However, this situation evolved with the takeover by the Algerian team, which made it possible to eliminate many unnecessary expenses.

4.3. Review of Operating Expenses of the GL1/Z Complex in 2020: This study focuses on the GL1/Z complex, specialized in gas liquefaction, financed through the central budget to cover its operational needs and expenditures. Like any institution, it experiences periods of financial difficulty and, being dependent on self-financing, adopts a cost-reduction strategy.

4.3.1. Breakdown of Cost-Reduction Efforts In 2020, operating expenses targeted three main accounts (60, 61, and 62) in order to avoid any deficit linked to the pandemic (based on internal company documents).

Account 60: Consumed Purchases This account includes raw materials (601), supplies (602), studies and services (604), equipment and works (605), and purchasing costs (608). Initial forecasts stood at 1,405,121 DZD and 553,872 in foreign currency. These were reduced to 983,585 DZD and 387,693 in foreign currency in June, representing a decrease of -421,536 DZD and -16,615 in foreign currency.

Account 61: External Services

This includes rents (613), insurance (616), studies/research (617), and documentation (618). The strongest reduction was recorded here due to the suspension of non-essential activities (research and studies), decreasing from 2,943,226 DZD and 119,467 in foreign currency to 2,060,258 DZD and 59,680 in foreign currency, with a record reduction of -882,968 DZD.

Account 62: Other External Services

This includes subcontracting (621), fees (622), advertising (623), and transport (624). The reduction was more limited (-194,989 DZD), as essential needs such as employee transport could not be eliminated.

Overall Assessment Unlike other entities, GL1/Z neither reduced wages nor downsized employment, limiting cost-cutting measures to accounts 60–62. Total costs decreased from 10,494,886 DZD to 8,962,694 DZD. The revision rate of expenses stands at -15%, distributed as follows:

- -30% for procurement costs
- -30% for external services
- -33% for other external services

4.3.2. Reduction of Material Resources for the Main Heat Exchanger Repair Project

During the first maintenance operation of the main heat exchanger of train 600 by the Algerian team, temporarily stored and imported resources (via Air Products and Chemicals Inc.) were used, while the workforce was local.

For the maintenance of train 500, 50% of the material resources were locally sourced (e.g., seals – Appendix 02), and 50% were imported (e.g., hand holes – Appendix 03).

With successive repair operations, performance improved and creativity developed. This was demonstrated during the maintenance of train 300, where 50% of the resources were manufactured by the repair team and 50% by an external Algerian subcontractor outside the complex, using advanced technologies capable of producing parts comparable in quality to American standards at lower cost.

In May 2021, the Algerian team repaired leaks in train 200 in just 12 days. The initial materials used were entirely supplied by a local subcontractor (with no internal production within the complex), although hand holes remain imported.

The analysis of invoices reveals substantial discrepancies between the prices applied during imports carried out by Air Products and Chemicals Inc. and those obtained through purchases from local subcontractors or internal production within the complex. Overall, these invoices represent a negligible share compared to the total value of previous services provided by the American company.

Indeed, during interventions by the Algerian team, expenditures were limited exclusively to spare parts, unlike operations conducted by the American company, which generated significant additional costs.

4.4.Impact of the Pandemic crisis on the GL1/Z Complex

Although the pandemic severely affected many companies, leading some even to bankruptcy, the national institution Sonatrach—and in particular the GL1/Z complex, which is the subject of this study—was relatively resilient. This is explained by a strict cost-rationalization

policy, which was a key factor in the complex's ability to overcome the production crisis by relying on internal entrepreneurial initiative and self-financing rather than external resources.

Invoice analysis highlights substantial differences between prices applied during imports carried out by Air Products and Chemicals Inc. and those resulting from purchases from local subcontractors or internal production within the complex. Overall, these invoices account for only a negligible fraction compared to the total cost of previous services provided by the American company.

Thus, interventions by the Algerian team limited expenditures strictly to spare parts, in contrast to operations led by the American company, which generated considerable additional costs.

It should be noted that this resource-control strategy was not a premeditated plan but rather a measure imposed by the pandemic itself, which can be described as a constrained response.

Fourthly -Results and Discussion

1. Resusts:

1.1. Superior Technical Performance: Contrary to initial expectations, the internal team demonstrated a rapid adaptation capacity and a better understanding of the local context, leading to a significant reduction in response times.

1.2. Drastic Cost Reduction: The absence of costs related to international mobility, high fees, and assistance contracts enabled notable financial optimization.

1.3. Emergence of Latent Entrepreneurship: Local engineers developed improvised innovative solutions and adapted alternative methods, reflecting a collective learning dynamic and revealing untapped entrepreneurial capital.

1.4. Organizational Limits: Despite their performance, internal teams received low financial recognition and lacked institutional valuation. This highlights a failure in the incentive system and insufficient organizational recognition.

2. Discussion:

2.1. Validation of Research Hypotheses: The results confirm that internal entrepreneurship has a positive and significant impact on organizational performance **(H1),** particularly in crisis contexts, which strengthen this relationship and contribute to cost reduction **(H2).** These

findings highlight that constrained environments can also stimulate the activation of internal organizational capabilities.

2.2. The Determinative Role of Participatory Innovation: Participatory innovation appears as a key driver of internal entrepreneurship, emphasizing the importance of employee involvement and collective intelligence. It enables the transformation of tacit knowledge into practical and operational solutions.

2.3. Human Capital as a Strategic Factor: Human capital exerts a dual positive effect on both internal entrepreneurship and organizational performance, confirming its central role in value creation. However, it remains underutilized due to insufficient recognition and ineffective internal management mechanisms.

2.4. Superiority of the Internal Model: Performance and Costs: The findings demonstrate that internal entrepreneurship reduces costs and enhances performance, suggesting that internal teams can be more efficient and responsive than external providers, thus questioning systematic outsourcing practices.

2.5. Crises as Catalysts for Organizational Transformation: Crises act as catalysts that reveal hidden organizational potential and activate intrapreneurial dynamics. This aligns with the dynamic capabilities perspective, where organizations strengthen their adaptability in response to external shocks.

2.6. Highlighting a Managerial Paradox: The study reveals a paradox in which organizations tend to overvalue external expertise while underestimating their internal competencies, reflecting weaknesses in skills governance and leading to excessive reliance on outsourcing.

This study implicitly introduces the concept of **Latent Human Capital Activated Under Constraint**. This concept highlights that human capital exists within organizations but often remains invisible and underutilized; its activation depends on specific contexts, notably constrained situations. Internal innovation thus constitutes a strategic lever that is complementary, or evens an alternative, to innovation from startups. Several key challenges are raised:

- **Rethinking skills governance:** Companies must transition
- From a logic of dependency to one of cognitive sovereignty.
- **Institutionalizing participatory innovation:** Implementing suggestion systems, reward mechanisms, and a sharing culture.

- **Valuing intrapreneurship:** Encouraging initiative-taking, experimentation, and accountability.

Implications for Algerian Companies

- Reducing dependence on foreign expertise;
- Strengthening organizational resilience;
- Developing an internal innovation ecosystem;
- Improving competitiveness.

Conclusion

This study highlights that participatory innovation and internal entrepreneurship are not limited to complementing external innovation but can, in certain contexts, surpass its performance. It thus emphasizes the central role of latent human capital as a lever for organizational transformation and resilience.

From this perspective, mobilizing these internal resources appears to be a rational and strategically superior organizational choice over the systematic recourse to external expertise, as it simultaneously allows for cost reduction, the strengthening of strategic autonomy, and the support of sustainable human capital development. Consequently, the transformation of Algerian companies requires a revaluation of human capital and the institutionalization of participatory innovation.

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