Evaluating and Developing the R&D Process by Applying the Burke-Litwin Model in an International Industrial Context

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Abstract

Based on a study by Tajhya (supervised by Varis), this article examines the utility of the Burke-Litwin model for evaluating R&D processes in international industrial technology organizations. It addresses the challenges in aligning strategic intent with daily R&D operations, proposing that understanding this alignment improves organizational efficiency amidst complex internal and external pressures (Kaplan & Norton, 2008; Tidd & Bessant, 2021).

Keywords: R&D process development, the Burke-Litwin model, strategic road mapping, innovation management

1. R&D Process as a System-Level Challenge

Modern industrial R&D organizations face the competing demands of structural stability and operational agility. R&D frameworks must execute structured strategic plans while simultaneously adapting to dynamic customer needs, technological advancements, and market competition (Tidd & Bessant, 2021). In practice, balancing these priorities often compromises decision-making and workflow consistency. Because these challenges stem from complex organizational interactions rather than isolated failures, analyzing individual processes is insufficient (Tidd & Bessant, 2021). Ambiguous prioritization, for example, degrades strategic alignment and disrupts communication, accountability, and collaborative decision-making. Operational inefficiencies during execution typically expose these underlying alignment gaps rather than independent execution flaws (Kaplan & Norton, 2008). Therefore, optimizing R&D performance requires a systems-thinking approach that examines the interdependencies among strategy, structure, processes, and people (Kaplan & Norton, 2008; Tidd & Bessant, 2021).

2. How the Burke-Litwin Model Supports Evaluation in This Context

The Burke-Litwin model provides a structured framework for analyzing organizations, including R&D units, as interconnected systems rather than isolated functions (Burke & Litwin, 1992). Critically, the model categorizes organizational variables hierarchically, spanning macro-level strategic and leadership dimensions down to micro-level operational practices and individual experiences. This hierarchical structure is highly effective in international R&D contexts, where outcomes depend on longitudinal interactions among systemic variables rather than isolated causal factors (Burke & Litwin, 1992; Tidd & Bessant, 2021).

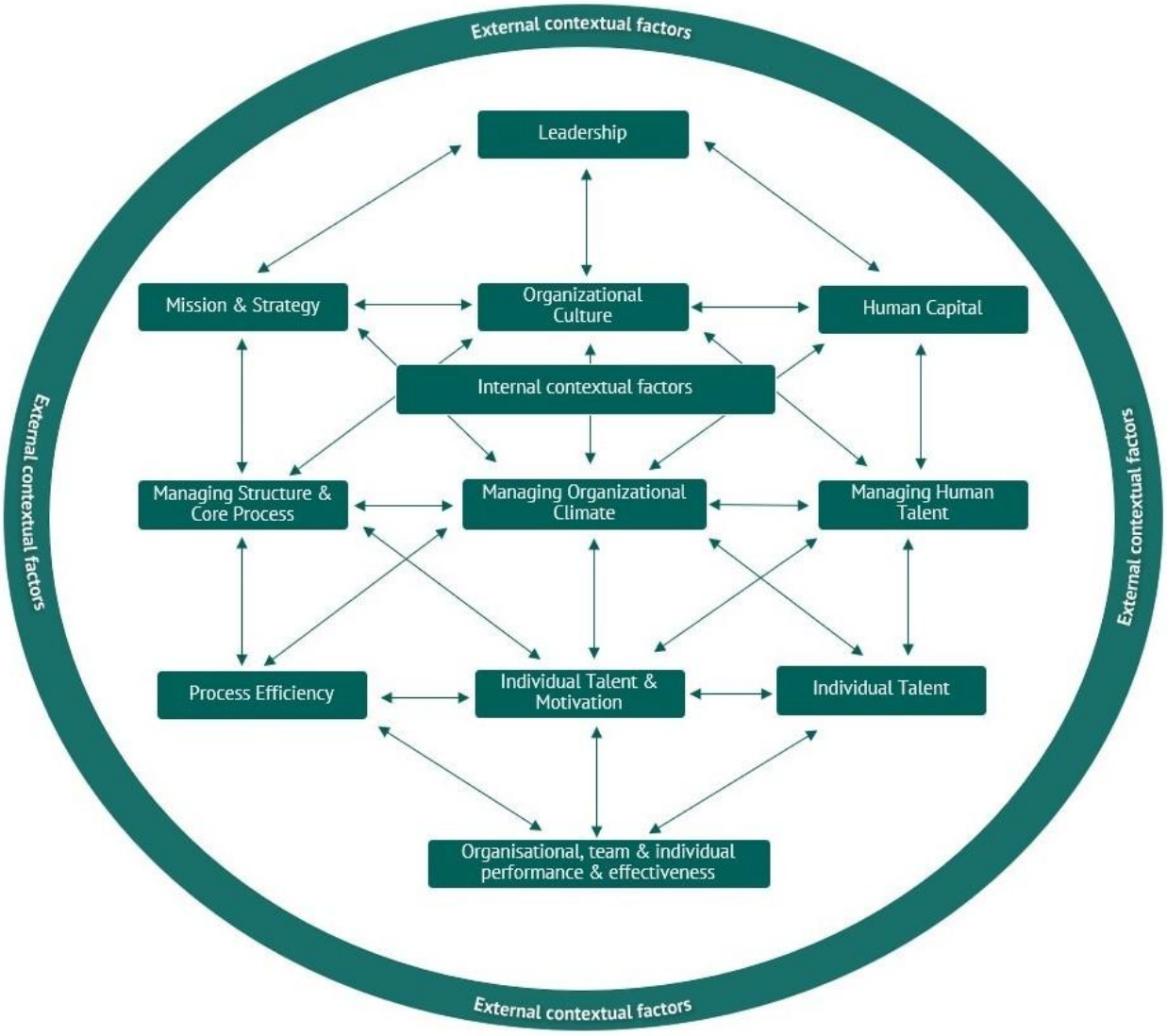

Figure 1. Adapted Burke-Litwin model (Spangenberg & Theron, 2013)

The Burke-Litwin model posits that organizational elements, including leadership, strategy, culture, structure, and processes, operate as an interdependent system. As illustrated in the revised framework by Spangenberg and Theron (2013), these variables continuously exert reciprocal influence, while adapting to external environmental forces, rather than functioning via a strict top-down hierarchy. Within industrial R&D, the external environment, comprising customers, competitors, and regulatory bodies, exerts continuous adaptation pressures.

Diagnostic evaluation within this framework spans multiple organizational strata. At the transformational level, leadership and strategy establish institutional direction. However, strategic intent frequently fails to translate into actionable operational priorities, yielding disparate interpretations and inconsistent execution downstream (Kaplan & Norton, 2008). Conversely, the transactional level comprises organizational culture, structure, management practices, and systems that convert strategic direction into coordinated action (Burke & Litwin, 1992; Spangenberg & Theron, 2013). In R&D environments, these transactional variables dictate project architecture, governance, and daily cross-functional collaboration (Tirpak et al., 2006).

Organizational culture, defined as implicit shared cognitive and operational paradigms (Schein, 2010), heavily mediates these dynamics. While robust informal collaboration and flexibility enhance agility, they can simultaneously obscure structural deficiencies; efficient informal coordination often compensates for, and ultimately supplants, formalized processes rather than supplementing them. Concurrently, structure and management practices govern daily

execution. Structure delineates roles and accountabilities, whereas management practices shape communication and decision-making pathways (Burke & Litwin, 1992; Spangenberg & Theron, 2013). Ambiguous role definitions or erratic decision-making introduce operational ambiguity and project delays, irrespective of individual workforce competence or motivation (Schein, 2010). Formal systems and processes, including planning routines and governance structures, remain ineffective unless aligned with these overarching strategic, leadership, and cultural dimensions (Burke & Litwin, 1992; Spangenberg & Theron, 2013).

At the individual micro-level, employee skills, needs, and motivation reflect the lived experience of organizational alignment. Incongruent role expectations systematically degrade workforce efficacy and perceived contribution, despite high individual commitment and capability (Schein, 2010). Consequently, the primary utility of the Burke-Litwin model lies in its capacity to visualize these systemic interdependencies, exposing latent misalignments that elude isolated functional analyses (Burke & Litwin, 1992; Spangenberg & Theron, 2013). This holistic diagnostic capability is uniquely suited for international R&D operations, where organizational elements and cultural diversities are geographically distributed across heterogeneous sub-units.

3. Bridging Evaluation and Development Through Structured Ways of Working

Although the Burke-Litwin model offers a robust framework for diagnosing organizational phenomena and identifying underlying causal mechanisms, it lacks a prescriptive methodology for operationalizing solutions. To bridge this methodological gap, empirical insights from the case study can be integrated into a structured, execution-oriented framework, such as the Plan-Do-Check-Act (PDCA) approach codified in ISO 56002:2019. ISO 56002:2019 establishes a governance-oriented framework designed to manage innovation as a coordinated, systemic organizational capability. Rather than prescribing rigid structural configurations or specific tools, the standard provides high-level guidance to ensure that innovation initiatives are planned, executed, evaluated, and optimized in a systematic, repeatable manner (International Organization for Standardization, 2019).

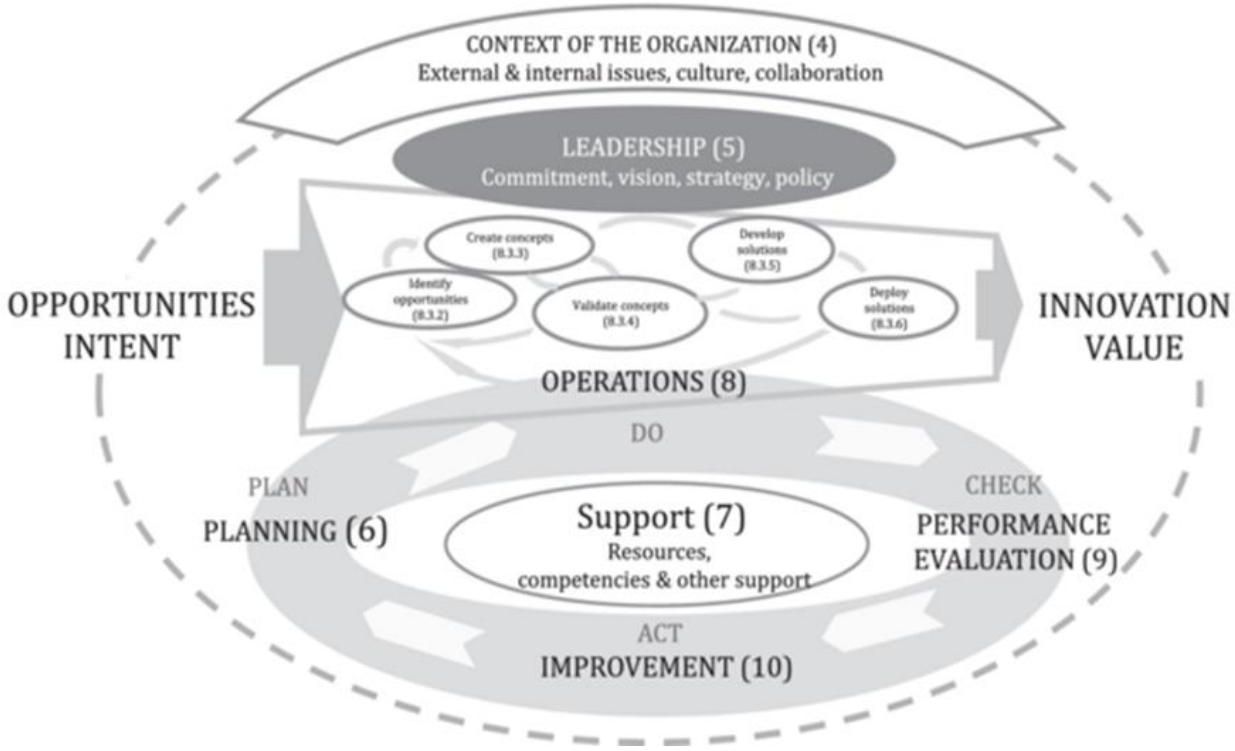

Figure 2. Innovation management system framework (adapted from ISO 56002:2019)

As illustrated in Figure 2, the innovation management system framework codified in ISO 56002 operationalizes the Plan-Do-Check-Act (PDCA) cycle. Within this R&D context, the PDCA cycle serves as a systematic mechanism to mitigate the organizational alignment challenges diagnosed via the Burke-Litwin framework. The *planning* phase

establishes an empirical baseline by clarifying institutional intent, strategic priorities, and resource readiness, thereby reinforcing the nexus between strategy and leadership while minimizing directionless execution. The subsequent *execution* phase operationalizes workflows through an iterative, bi-directional process that permits recursive feedback loops to preceding operational stages. Systemic evaluation occurs during the *checking* phase, which mandates structured reflections to verify that operational outputs remain synchronized with overarching strategic objectives. Finally, the *acting* phase institutionalizes organizational learning, embedding empirical insights into future operational cycles to prevent knowledge degradation.

Beyond iterative process logic, this framework incorporates systemic governance, formalized decision-making pathways, and explicit accountabilities. These components directly map onto the transactional and transformational elements of the Burke-Litwin model, ensuring that structural optimization addresses both process mechanics and cross-functional governance. The utility of the PDCA cycle within complex R&D environments rests on its capacity to balance procedural structure with operational agility. It provides a scalable, repeatable methodology that safeguards strategic alignment without constraining the adaptability required by dynamic market forces, avoiding both rigid bureaucratic paralysis and unstructured operational inconsistency (Tidd & Bessant, 2021). Consequently, the integration of the ISO 56002 PDCA framework enables a seamless operational transition from diagnosing systemic vulnerabilities to executing targeted organizational interventions.

4. Conclusion

This study proposes a holistic, systems-thinking approach for international R&D organizations by integrating the Burke-Litwin model with the ISO 56002:2019 framework. This methodology addresses the stability-agility paradox by mapping systemic dependencies and utilizing the Plan-Do-Check-Act (PDCA) cycle to bridge diagnostic insights with actionable operational improvements, ensuring strategic alignment in complex environments.

5. Limitations

We do not claim that the Burke-Litwin model and the ISO 56002:2019 framework are the only valid models for assessing and developing companies' R&D processes in practice. There are certainly other valid models, and what they might be is a matter for further research.

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