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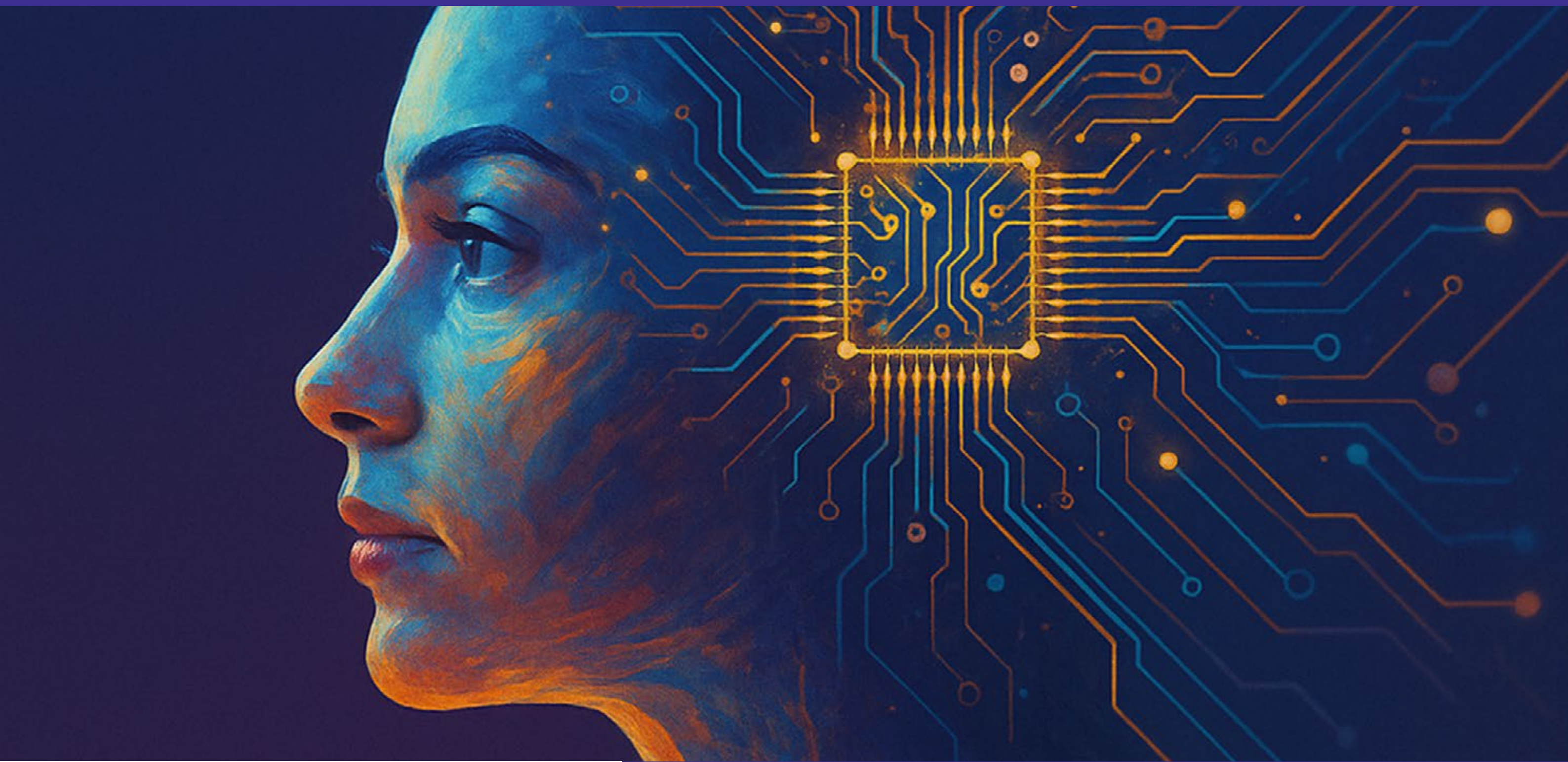

LIGHTS - Technology

Towards a machine-readable standard ontology for business strategy

ESCP Impact Paper No.2025-33-EN

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Abstract

Most companies still struggle to turn strategy into action. Our interviews with 20+ C-suite leaders reveal four self-reinforcing gaps: fragmented language, ad-hoc processes, static tools and inadequate capabilities, all reinforcing each other into what we call "the Strategy Chasm". We show that these gaps violate Ashby's law of requisite variety: the business environment is more complex than the organisation's ability to respond. We prescribe a dual fix. First, a universal, machine-readable strategy ontology that distils half a century of research and practice into a common language. Second, AI strategy co-pilots, built on knowledge graphs which converts the universal strategy ontology in a machine-readable standard, and linked to LLM agents which can proficiently process language. This technical architecture has already been implemented in other knowledge-intensive sectors where standard ontologies exist (e.g. legal services or pharmaceutical research). The strategy co-pilots amplify managerial insight, synthesising context, critiquing drafts and suggesting strategic options in real time. With this paper, we suggest design principles for the strategy ontology and a visual representation: the Strategy in Action Canvas™. The result is a scaffolding for a computable, continuously learning, strategy system that compresses planning cycles from months to days.

Keywords: strategy ontology, knowledge graphs, generative and semantic AI, strategy

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The Strategy Chasm: an ongoing problem

In an era when generative-AI copilots draft legal briefs, supply-chain twins anticipate bottlenecks, and chatbots handle first-line customer care, we felt it was important to ask what these transformative technologies could do for the most fundamental managerial task of all: formulating and executing strategy. This question becomes urgent when we consider a stark paradox: despite the academic literature on strategy exceeding 20,000 peer-reviewed articles and leading consultancies selling billions in strategy work each year, most companies still struggle to turn strategy into action.

Prompted by this paradox, we examined how strategy is practised today inside large, multi-division firms, looking for gaps that an AI-enabled research agenda could close.

In the second half of 2024 we conducted in-depth interviews with 20+ senior executives across Europe and North America. Participants included CEOs, Chief Strategy Officers, and board members from organizations ranging from $500M to multi-billion-dollar enterprises across diverse industries. These companies included both public- and private-ownership structures, offering a comprehensive view of the current practice of strategy across different contexts.

Our research uncovered a systemic pattern of dysfunction in how organisations approach strategy. These challenges begin at the core: how organisations define and frame strategic choices; and cascade outward to processes, tools, and organisational capabilities.

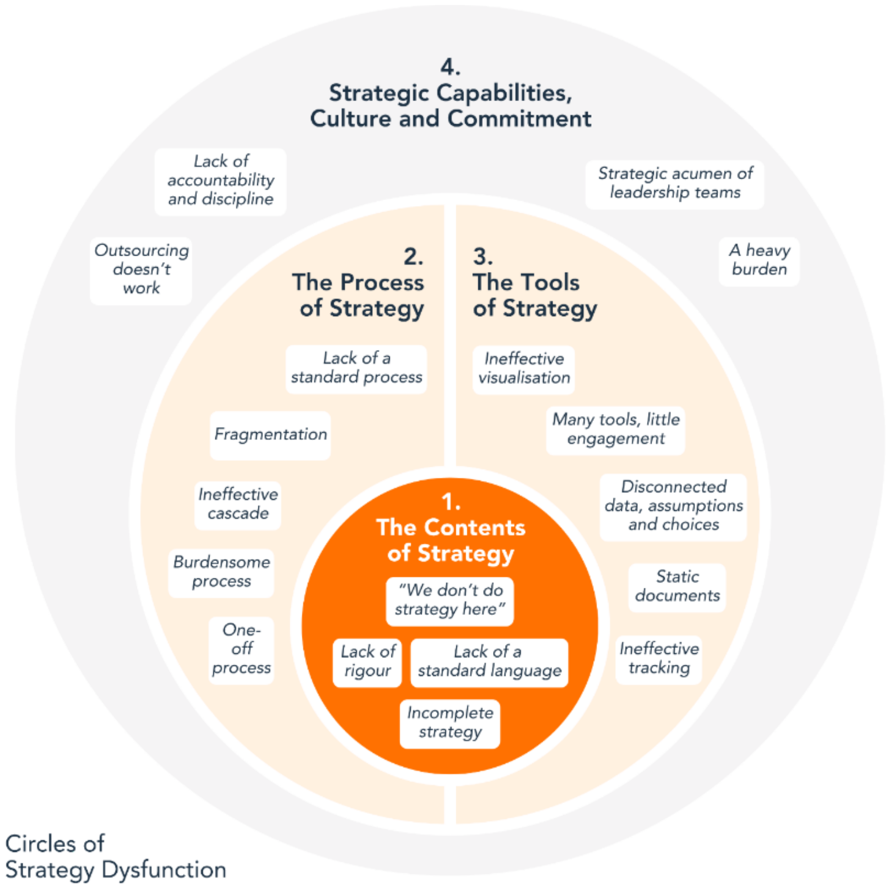

Fig 1: The circles of strategy dysfunction

This dysfunction manifests in four interconnected layers, each building upon and amplifying the weaknesses of the previous one:

The contents of strategy: Many organisations suffer from a fragmented understanding of strategy, often confusing it with financial planning or operational effectiveness. This results in incomplete strategies lacking clarity, focus, and creativity. The lack of a shared standard definition of strategy exacerbates misalignment, while a narrow, disconnected focus on functional siloes such as products, internal operations, or financial results limits customer-centric thinking, competitive insight, and innovation.

The process of strategy: The process of strategy in many organisations is plagued by inefficiencies, fragmentation, and a lack of continuity. Often, strategy lacks a repeatable and formalised methodology and process, instead emerging through ad hoc efforts and siloed planning across departments and levels. Strategic objectives are not cascaded effectively throughout the organisation and follow burdensome processes that consume significant time and resources, resulting in one-off exercises rather than a continuous, adaptive effort.

The tools of strategy: The tools organisations use to formulate, communicate, and execute strategy often hinder rather than help. Static and disconnected documents, as well as overly complex tools, fail to capture the dynamic and interconnected nature of strategy, leaving decision-makers unable to adapt plans as conditions change. The lack of tools that link data, assumptions and choices, undermines coherence and well-informed decision-making, and the absence of robust yet nimble mechanisms to track progress and integrate feedback creates a disconnect between planning and execution.

Strategic capabilities, culture and commitment: Leadership teams often lack the strategic acumen required for effective decision-making, leaving responsibility disproportionately on the CEO and external consultants. A lack of managerial accountability and discipline undermines the ability to adhere to strategic priorities, while over-reliance on external consultants fosters dependency and limits internal ownership and commitment.

We call this systemic dysfunction the **Strategy Chasm**—the growing gap between an organization's strategic aspirations and its actual capacity to formulate and execute strategy effectively. This chasm manifests when the complexity of strategic challenges exceeds the organization's ability to process and respond to them, creating a widening divide between where companies want to be and what they can achieve.

Ashby's Law: the conceptual diagnosis

We have asked ourselves what could be the fundamental root cause of these symptoms?

Framed through Ashby's Law of Requisite Variety—***only variety can absorb variety***[1]—the dysfunction we observe can be seen as a systemic mismatch: the strategic environment presents more complexity than the firm's inadequate capabilities, processes and tools can regulate. Looking at the field of management from a system-thinking perspective, organisational viability hinges on the management system possessing the requisite amount of variety to match the variety of the organization's environment (internal and external). Every significant management innovation in history can be seen as either aiming at attenuating the variety of the environment or increasing the variety of the management system. When H. Ford introduced the discipline of standardization in mass manufacturing, it reduced significantly the variety of the manufacturing environment. When T. Oho introduced the philosophy and practice of continuous improvement in manufacturing, it created a significant increase in the managerial variety by engaging every shopfloor worker in critical problem-solving tasks.

Strategy models and frameworks are, by design, simplifications, hence variety attenuators. They categorise entities, resources and choices so leaders can reason about complex questions. But simplification comes at a price: in applying those models, reality's richness, and messiness, must be re-introduced by someone who deeply understands both the models and the context. Our interviewees call this "re-hydrating the framework" and it demands both deep industry insight and conceptual fluency—an uncommon skill set that drives many firms to outsource the work to consultants. Outsourcing, however, creates a dangerous separation of formulation from execution; when the deck is handed over, tacit knowledge stays with the external team, and internal commitment wanes, making implementation fragile.

A systemic solution for a systemic problem

We posit that resolving such systemic issues requires both levers of variety attenuation and amplification:

1. Developing a universal, standardised strategy ontology that attenuates system variety by harmonising and integrating all the essential constructs of strategy formulation and execution

[1] Variety, in system thinking, indicates the number of distinct states that a system can possess. It is therefore a measure of the complexity of the system. The Law of Requisite Variety states how for a system regulator to be able to effectively control a given system, the regulator must possess at least the same variety (complexity) of the system itself and its environment.

2. Building AI Strategy co-pilots that amplify managerial variety by analysing and synthesizing large amounts of unstructured data, generating insights, surfacing patterns, and generating strategic options at machine speed.

In tandem, ontology and AI align internal and external complexity, supplying the requisite variety that effective strategy formulation and execution demands.

A close analogue to the envisioned strategy co-pilot already operates in another knowledge-intensive field: **Thomson Reuters' Westlaw Edge** legal-research platform. Westlaw Edge sits atop a domain-specific knowledge graph that encodes statutes, regulations, case law and secondary literature in a rigorously curated ontology. Because this ontology—effectively *"the Law itself"*—is already universally standardised (every judgment carries a unique citation, every statute a canonical hierarchy), generative-AI modules can retrieve, reason over and summarise precedents with auditable provenance in real time. Lawyers pose natural-language questions and receive answers linked directly to authoritative sources, compressing days of research into minutes while preserving doctrinal rigour. **By contrast, business strategy lacks such a standard integrative ontology.** Only once this semantic foundation exists can knowledge-graph-enhanced AI co-pilots match external complexity, close the Strategy Chasm and deliver the "months-to-moments" acceleration described in our proposal.

First lever: the universal strategy ontology

The starting point is the development of a standardised, universal ontology of business strategy that harmonises half a century of academic constructs into a stable set of entities and relationships, yet one which is flexible enough that it can be applied effectively in a very broad variety of contexts. This strategy ontology must be visually clear and stimulating for humans, while at the same time expressed in rigorous knowledge-graph languages (RDF/OWL) so it can power LLM reasoning, retrieval-augmented generation and AI agentic systems.

Designing a universal strategy ontology requires balancing the needs of human strategists and AI-driven machines. Below are key design principles to ensure the ontology is intuitive for human use—enhancing clarity, integrative thinking, creativity and decision-making—and robust for machine reasoning—supporting explainability, structured analysis, and generative AI applications.

Human-centred design principles:

· **Integrative synthesis of strategy theory**: The ontology must integrate and reconcile the multitude of strategic models developed over the past decades into one coherent schema. A universal ontology should capture the essential entities from each model and map their relationships, enabling practitioners to see how they interconnect within a unified language.

· **Normalization of redundant concepts**: With many frameworks covering adjacent ideas under different terminologies, the ontology should normalize overlapping or synonymous concepts to eliminate duplication and confusion. For instance, the notion of a firm's unique strength appears as "core competency" in one theory and "distinctive capability" in another; a well-designed ontology would reconcile these into a single conceptual node.

· **Clarity, memorability, and visual structure**: The ontology should be visually structured in a clear and memorable way that aids human cognition. A well-organized visual ontology can serve as a mental model for strategy formulation. The design should be intuitive enough that strategists can sketch it on a whiteboard to facilitate creativity and collaborative sensemaking, while simultaneously enabling a better, simpler and more effective engagement of all employees with the strategy set by their leaders.

· **Enhancing (not constraining) strategic thinking**: While the ontology imposes structure, it must not become a rigid checklist that stifles creativity. Instead, it should function as a flexible guide that prompts holistic thinking. Strategy is highly context-dependent and does not follow a one-size-fits-all formula, so the ontology should accommodate industry-specific factors. Rather than prescribing answers, the ontology should be considered a "question engine" posing all the necessary questions in a coherent and harmonised structure to enhance human practical reasoning.

Machine-oriented design principles:

· **Explainable and formal reasoning**: For AI applications, the ontology should leverage semantic web standards (such as RDF for data modelling and OWL for defining ontologies) to enable rigorous, explainable reasoning. Using a logic-based formalism ensures that knowledge encoded in the ontology can be better processed by LLMs. Crucially, this structured reasoning is explainable: such an AI system can trace why a recommendation was made (e.g. "Objective A is at risk because its enabling Capability X is weak"), because the inference follows the ontology's defined relations.

· **Embedding the ontology into LLM reasoning**: The ontology should be engineered to work hand-in-hand with Large Language Models (LLMs) and AI agenting systems as a source of grounded context and domain knowledge. Whereas LLMs excel at language and pattern recognition, an ontology provides them with a structured strategic context that enhances their reasoning capabilities. By embedding semantic context (via knowledge graph substructures) into the LLM's prompts, we can guide the AI to reason along the lines of strategic logic rather than just statistical text patterns. The ontology thus serves as a reasoning scaffolding for generative AI, ensuring that AI-driven RAG, analyses or reasoning remain grounded in validated strategic theory.

· **Dynamic, evolving knowledge base:** The ontology should not be a static, once-and-for-all map of strategy – it must function as a dynamic knowledge base that grows and adapts with new data. This means the design should support continuous integration of information from both open sources (e.g. market reports, news feeds, industry databases) and proprietary internal sources (e.g. company performance data, internal memos). In technical terms, the ontology-backed knowledge graph can be kept updated via data pipelines, feeding it with real-time signals about the business environment. The alignment with semantic web standards also makes the ontology interoperable, allowing different systems and datasets to link into the strategy knowledge graph. We think of it as a **digital twin** of the company's strategy, updated in near-real time.

· **Modelling human practical reasoning:** The ontology should semantically distinguish between the three fundamental components of human practical reasoning: **beliefs** (facts and properties of the external and internal environment which the organization believes to be true), **desires** (goals, objectives, and future states that the organization aims to achieve), and **intentions** (plans, commitments to specific actions, and strategic choices). This BDI (Belief-Desire-Intention) framework enables AI systems to reason about strategy in ways that mirror human cognitive processes, distinguishing between what is known, what is wanted, and what is planned—enabling a critical role for humans in the reasoning loop.

Overall, these design principles ensure that a universal strategy ontology serves a dual purpose: it provides humans with an integrated "strategy map" that enhances understanding and creativity, and it provides machines with a rigorous "strategy knowledge graph" that enables advanced, explainable reasoning.

Second lever: AI strategy co-pilots

Recent advances in large language models, retrieval-augmented generation and knowledge graphs offer a way forward to augment cognitive processing of managers and systemise strategic learning. Such an AI co-pilot would be able to perform critical tasks that amplify managerial variety:

Automated contextual insights: Processing vast amounts of structured and unstructured data to surface strategic implications in real-time, mapping findings directly to ontology.

Applications:

- Auto-generated strategic insights refreshed periodically.
- Strategic questions and constructs are formulated in the contextual "language" of the industry.
- Auto-generated executive synthesis of real-time execution status across hundreds of initiatives, projects and OKRs, against initial hypotheses.

Expert critique: Evaluating strategic coherence across all components of the ontology, identifying inconsistencies and gaps that human strategists might miss.

Applications:

- Instant feedback on any given strategic choice.
- Overall strategic coherence assessed throughout the full domain of choices.
- Auto-reformulation of human-generated statements, choices, objectives etc.
- Gaps in insights or reasoning identified and converted into context-specific questions.

Strategic options generation: Combining pattern recognition with ontological structure to generate strategic alternatives that maintain internal coherence while addressing market dynamics.

Applications:

- Automated facilitation of discussions during executive workshops.
- Deep research for analogies across industries and contexts, to inform the generation of strategic options.
- Automated generation of strategic pivots during execution based on real-time evidence from the field.

The Strategy in Action Canvas: a practical implementation

The **Strategy in Action Canvas** provides a visual interface to the machine-readable ontology, translating abstract concepts into a practical framework that executives can use immediately. Rather than presenting yet another strategy model, the Canvas serves as the human-readable manifestation of the universal ontology described above.

It captures *what* an organization aspires to achieve, *where and how* it will compete, *how* it will deliver on its choices, and *how* it will translate plans into action and outcomes.

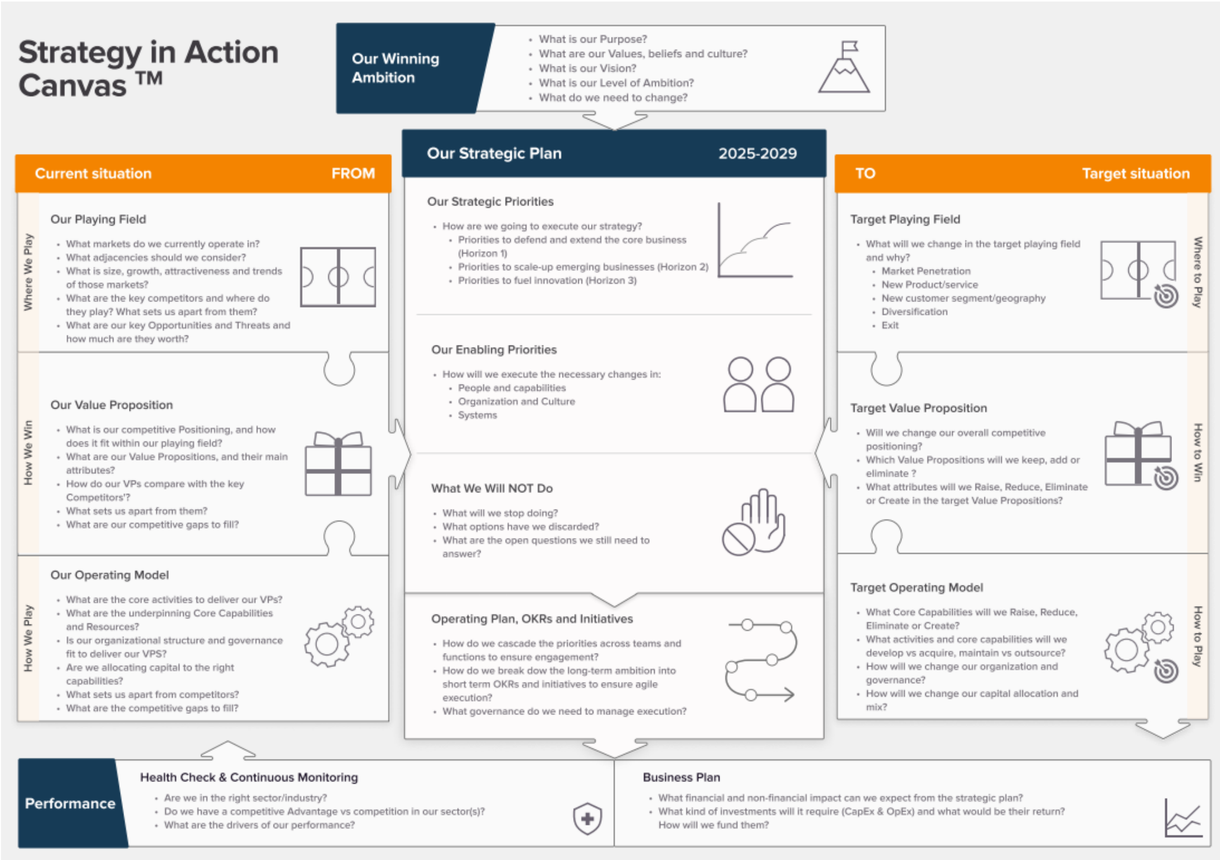

Fig. 2: The Strategy in Action Canvas

The Canvas organizes strategic thinking around four core components that map directly to ontological entities:

1) Winning Ambition: a precursor of strategic choices that defines the organization's overarching purpose and long-term vision. This element encapsulates *why* the company exists and *what "winning" means* for it in the future. It includes the mission (or purpose), core values, and envisioned future state, as well as a balanced score card describing the future state though a choice of metrics.

2) Strategic Choices: This section of the Canvas articulates how the organization will move from its current state to the desired future state across three domains:

> **2.a Playing Field (Where to Play)**: The "FROM" analyses current competitive arenas across six dimensions (customer segments, needs, products/services, channels, geographies, vertical integration). The "TO" defines explicit choices about where to compete in the future to achieve the Winning Ambition and, critically, where not to play.
>
> **2.b Value Proposition (How to Win)**: The "FROM" captures the analysis of the current customer value proposition and competitive positioning, in comparison with competitors. The "TO" defines the specific, deliberate choices about how the company will differentiate and deliver superior value in the chosen playing field.
>
> **2.c Operating Model (How to Play)**: The "FROM" describes the current configuration of capabilities, activities, and organizational resources, in comparison with competitors. The "TO" articulates the envisaged changes in capabilities, systems,

resource allocation policies and organizational structure needed to deliver the new value proposition.

Each "From–To" trajectory, represents a strategic hypothesis of how maintaining or changing the current strategic choices will achieve the winning ambition.

3) Strategic Plan and Execution translates strategic choices into mid- to long-term priorities and actionable initiatives.

3.a Strategic Priorities are the key actionable plans over the planning horizon (e.g. 3–5 years), categorized by growth horizon: defend/extend the core business, scale up emerging opportunities, and fuel innovation.

3.b Enabling Priorities are the plans to build or transform the organisational capabilities required to deliver Strategic Priorities, focusing on people & capabilities, organization & culture, and systems (technology and processes).

3.c Operating Plan breaks down the Priorities into specific Objectives and Key Results (OKRs) and supporting initiatives. This participatory approach engages teams in creating their own strategic contributions, overcoming resistance to change through ownership and accountability.

4) Performance Management and Feedback: no strategy is complete without mechanisms to track performance, and ensure that the strategy remains on track and relevant, including:

4.a Business Plan translates strategic choices into forward-looking financial statements, including budgets, investment requirements and long-term financial metrics that ensure fiscal responsibility.

4.b Health Check monitors financial performance indicators in real time, enabling continuous learning and adaptation. This closes the feedback loop, where strategic outcomes inform possible revisions to strategy, creating a dynamic rather than static system.

The Canvas's power lies not in its visual simplicity, but in its connection to the underlying knowledge graph. When implemented digitally, each Canvas element becomes a semantic node that enables AI-powered reasoning, analysis, and insight generation. This transforms the Canvas from a static planning tool into a dynamic strategic intelligence system.

The integration enables AI co-pilots to provide contextual insights ("Competitor X's expansion impacts your Playing Field choices"), expert critique ("Your Value Proposition lacks supporting Operating Model capabilities"), and strategic options generation ("Three pivot scenarios that maintain Canvas coherence while addressing market feedback").

Conclusions: from months to moments

The integration of a universal strategy ontology with AI co-pilots represents a fundamental shift in how organizations approach strategy—compressing months of traditional planning into days or even moments of insight. This system solves the requisite variety problem through a dual mechanism: standardization reduces cognitive complexity, while AI amplifies management's capacity. The result is a more agile strategic process that balances structure with adaptability.

For executives, the implications are profound:

Accelerated strategic cycles: Strategy formulation shifts from episodic to continuous, enabling organizations to sense and respond to market changes in near real-time.

Enhanced strategic alignment: The common language of the ontology ensures every function and level speaks the same strategic dialect, eliminating the costly "Tower of Babel" effect.

Democratized strategic thinking: AI co-pilots allow more employees to engage meaningfully with strategy, expanding participation beyond the executive suite.

Persistent strategic memory: The knowledge graph captures strategic reasoning and learning that would otherwise be lost during leadership transitions or restructuring.

The future of strategy isn't just faster or better strategy—it's a fundamentally different approach that harnesses the complementary strengths of human judgment and machine intelligence through the bridge of a universal, machine-readable ontology.

The strategic advantage will go to those who cross the strategy chasm first.

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Appendix: Literature mapping of Canvas elements to strategy concepts

To highlight the theoretical underpinnings of each component, **Table 1** provides a non-exhaustive reference mapping.

Canvas Element	Related Strategic Concepts/Authors
Winning Ambition	Strategic Intent – Gary Hamel & C.K. Prahalad
	Visionary Goals (BHAG) – James C. Collins & Jerry I. Porras;
	Winning Ambition - Langley & Martin
	Balanced Scorecard; Kaplan and Norton
Playing Field	Product-Market Scope – H. Igor Ansoff;
	Arenas (Where to Compete) – Donald C. Hambrick & James W. Fredrickson
	Where to play - Langley & Martin
	Industry five forces; M. Porter
	Experience curve and Growth-Share matrix; B. Henderson 1970
	Jobs to be done; C. Christensen
	Core vs. adjacencies (Chris Zook, Bain)
Value Proposition	Competitive Advantage and Generic Strategies – Michael E. Porter;
	Blue Ocean Strategy (Value Innovation) – W. Chan Kim & Renée Mauborgne,
	15 pureplays of positioning., Leinwand and Meinardi
	The elements of Value; Bain and Co. HBR
	Value Proposition; J. Magretta; M. Porter
	How to Win - Langley & Martin
	Value Disciplines (Treacy & Wiersema, 1993)
Operating Model	Resource-Based View – Jay Barney;
	Core Competence – C.K. Prahalad & Gary Hamel
	Dynamic Capabilities – David J. Teece et al.;
	Core Capabilities and the coherence advantage, Leinwand and Meinardi
	Value Chain and Activity systems; M. Porter
	Business Model Canvas; A. Osterwalder
Strategic and Enabling Priorities	Three Horizons Framework – Mehrdad Baghai, Stephen Coley & David White;
	Organizational Ambidexterity – Charles A. O'Reilly & Michael L. Tushman;
	Capabilities and Management System; Langley & Martin
	McKinsey 7-S Framework – Robert H. Waterman, Tom Peters & Julien R. Phillips;
	Leading Change (8-Step Model) – John P. Kotter;
	Diagnosis and Guiding Policy; R. Rumelt
	SWOT and Strategic Priorities; Collins
Operating Plan	Management by Objectives – Peter F. Drucker;
	Strategy Execution (Making Strategy Work) – Lawrence G. Hrebiniak;
	OKRs; J. Doer

Table 1: Mapping of Strategy in Action Canvas components to foundational strategy literature and frameworks.