

TOWARD STRATEGIC PLANNING ENGINEERING

Theoretical Foundations, Scientific Specialisation,
and the Proposal of an Integrative Research Field

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Abstract

Strategic planning has progressively absorbed concepts and methods from knowledge management, strategic foresight, decision sciences, systems engineering, organisational learning, evaluation, and research on dynamic capabilities. Yet these contributions remain dispersed across several scientific traditions. This conceptual article examines whether their interfaces can be formalised within an integrative research field termed Strategic Planning Engineering.

The proposal is grounded in a principle of scientific specialisation and integration: as knowledge expands and complexity increases, science tends to create more specialised subfields capable of producing greater analytical precision, while simultaneously creating a need for architectures that reconnect fragmented expertise. The paper adopts a thesis-antithesis-synthesis structure. The thesis argues that strategic planning has become sufficiently complex to be studied as an engineered architecture. The antithesis questions whether a new field is necessary when established disciplines already address its components. The synthesis positions Strategic Planning Engineering not as a replacement for existing fields, but as an integrative architecture focused on their interfaces.

The proposed Doura architecture comprises twelve functions: Strategic Problem Engineering, Knowledge Engineering, Imagination Engineering, Methodological Intelligence, scientifically autonomous Directed Research, Evidence Engineering, Decision Intelligence, Strategic Foresight, Strategic Planning, Action, Evaluation and Institutional Learning, and Re-engineering. The article does not claim that a new discipline is already established. Instead, it proposes a research programme through which conceptual distinctiveness, operationalisation, empirical validity, and disciplinary legitimacy may be tested.

Keywords: strategic planning; systems engineering; knowledge management; strategic foresight; organisational learning; Imagination Engineering; Methodological Intelligence; Decision Intelligence; Directed Research; evidence integration.

1. Introduction

Strategic planning can no longer be reduced to the production of plans, objectives and schedules. Contemporary organisations operate under conditions of information abundance, technological acceleration, interdependence and uncertainty. As a result, they must not only plan; they must also formulate problems, organise knowledge, recognise ignorance, imagine alternative futures, choose methods, produce evidence, decide under uncertainty, act, evaluate consequences and learn.

Classical and contemporary scholarship already contains important elements of this transformation. Simon's work placed decision-making at the centre of administration and rejected assumptions of perfect rationality (Simon, 1947). Mintzberg later criticised the excessive formalisation of strategy-making and distinguished analytical planning from the synthesis involved in strategy formation (Mintzberg, 1994). Strategic foresight research has shown how scenarios can broaden decision frames and support organisational learning (Schoemaker, 1995; Godet, 2000; Bootz, 2010). Dynamic capabilities research has further emphasised the organisational capacities required to sense, seize and reconfigure under change (Teece, 2007).

The central problem is therefore not the absence of relevant knowledge. It is the fragmentation of relevant knowledge across fields. This paper asks whether the interfaces among these fields can themselves become a legitimate object of systematic research.

Research question: Can an integrative architecture be formalised to transform strategic problems into structured knowledge, knowledge into alternative futures, alternatives into researchable questions, evidence into revisable decisions, and action into institutional learning?

2. Methodological Note: Search for Intellectual Antecedents

This article is a conceptual research paper rather than a systematic review. Nevertheless, because it advances a field-building proposition, a preliminary search for intellectual antecedents was conducted to reduce the risk of presenting established ideas as novel.

Searches were conducted using combinations of the expressions Strategic Planning Engineering, engineering of strategic planning, strategic planning and systems engineering, strategic planning and knowledge management, strategic foresight and organisational learning, and related formulations. The search also examined landmark literature in decision-making, strategic planning, scenario planning and dynamic capabilities. The objective was not exhaustive bibliometric coverage, but identification of major conceptual antecedents and of uses of engineering language around strategic planning.

The search identified, among other antecedents, Andrade and Loureiro's systems-engineering-based model of strategic planning, published in 2018, which explicitly applies systems engineering to the elaboration of strategic planning. This finding is important because it demonstrates that engineering approaches to strategic planning predate the present proposal. The contribution advanced here must therefore be defined more narrowly: the proposed novelty lies in the explicit integration of knowledge, imagination, methodology, autonomous research, evidence, decision, foresight, action and institutional learning under a single architecture, not in the general idea of applying engineering principles to planning.

Accordingly, this article avoids claims of historical primacy. A later systematic or bibliometric review would be required before any priority claim could be justified.

3. Doura's Principle of Scientific Specialisation and Integration

The proposal rests on a broader epistemological observation: the growth of knowledge pushes science toward increasing specialisation. As domains become more complex, specialised subfields emerge in order to isolate variables, improve measurement, refine methods and generate more precise explanations.

Doura's Principle of Scientific Specialisation and Integration: As knowledge expands and complexity increases, science tends to create increasingly specialised sub-disciplines capable of producing clearer and more precise knowledge; their collective strategic value, however, depends on architectures capable of reconnecting these specialised contributions.

This principle implies a dual movement. Specialisation increases precision; integration restores coherence. Strategic Planning Engineering is proposed at the intersection of these two needs: a specialised field concerned specifically with the architecture connecting strategic knowledge processes.

4. Intellectual Foundations

4.1 Decision-making and bounded rationality

Simon's Administrative Behavior established decision-making as a central object of administrative analysis and challenged models based on unlimited rationality (Simon, 1947). This tradition is foundational for any strategic architecture because strategic decisions are necessarily made under incomplete information and cognitive constraints.

4.2 Strategic planning and its limits

Mintzberg's critique of strategic planning is particularly important for the present proposal. He argued that formal planning should not be confused with strategy formation, which also depends on synthesis, learning and judgement (Mintzberg, 1994). Strategic Planning Engineering must therefore avoid becoming a new form of rigid formalism.

4.3 Strategic foresight and scenarios

Scenario planning provides structured ways to explore uncertainty. Schoemaker (1995) presented scenarios as a tool for strategic thinking that can counter overconfidence and tunnel vision. Godet (2000) likewise emphasised scenario methods as tools that stimulate imagination and reduce collective biases. Bootz (2010) demonstrated strong links between strategic foresight and organisational learning while noting that the precise nature of this relationship remains conceptually ambiguous.

4.4 Foresight and organisational learning

Later work by Bootz, Monti, Durance, Pacini and Chapuy (2019) analysed dozens of foresight projects and showed how foresight practices can extend from decision support toward more operational forms of organisational learning. This literature provides an important antecedent for the feedback mechanisms proposed here.

4.5 Dynamic capabilities

Teece (2007) conceptualised dynamic capabilities through sensing, seizing and reconfiguring. These processes demonstrate that strategy requires not only plans but adaptive organisational capabilities. Strategic Planning Engineering builds on this insight but focuses specifically on the architecture that connects knowledge production to adaptation.

4.6 Systems engineering applied to strategic planning

Andrade and Loureiro (2018) explicitly proposed a strategic planning model based on systems engineering. Their contribution is a direct antecedent because it demonstrates the use of systems-engineering logic to broaden the scope of organisational strategic planning. The present model differs by extending the integration toward research autonomy, evidence synthesis, imagination, methodological choice and institutional learning.

5. Thesis - Antithesis - Synthesis

5.1 Thesis: strategic planning has become an object of engineering

The thesis advanced here is that contemporary strategic planning now contains enough interacting functions, interfaces and feedback mechanisms to be studied as an engineered architecture. Engineering is used in a methodological sense: the systematic design of components, interfaces, validation rules and feedback loops.

Strategic planning would therefore be redefined not only as the production of plans, but as the design of systems capable of producing, testing, implementing, evaluating and revising strategies.

5.2 Antithesis: why create a new field?

The strongest objection is that all proposed components already exist. Knowledge management studies knowledge; foresight explores futures; decision sciences analyse choice; systems engineering designs systems; organisational learning studies adaptation; and strategic management studies strategy. A new label may therefore create unnecessary fragmentation.

A second objection concerns the limits of engineering metaphors. Human organisations contain culture, values, conflict, politics, ambiguity and emergent behaviour. No strategic architecture can eliminate these phenomena. Mintzberg's critique of excessive formalisation is therefore a permanent warning against presenting strategy as a mechanically optimisable process.

5.3 Synthesis: an integration field rather than a replacement field

The synthesis proposed here is that Strategic Planning Engineering should not replace existing disciplines. Its distinctive object would be the design and validation of interfaces among them. Its core scientific question would be: how should knowledge, imagination, methods, research, evidence, decisions, foresight, implementation and learning be connected so that the overall strategic system remains rigorous and adaptive?

Specialisation produces precision; integration produces strategic coherence.

Antecedent	Primary contribution	Relationship to proposed field
Simon (1947)	Decision-making under bounded rationality	Provides decision-theoretical foundation
Mintzberg (1994)	Critique of formal strategic planning	Boundary condition: engineering must not become rigid formalisation

Antecedent	Primary contribution	Relationship to proposed field
Schoemaker (1995)	Scenario planning for strategic thinking	Supports structured exploration of multiple futures
Godet (2000)	Scenario methods and strategic prospective	Links imagination, scenarios and strategic appropriation
Bootz (2010)	Strategic foresight and organisational learning	Supports the learning interface
Teece (2007)	Dynamic capabilities	Supports sensing, adaptation and reconfiguration
Andrade & Loureiro (2018)	Strategic planning model based on systems engineering	Direct engineering antecedent
Doura framework	Integration of knowledge, imagination, method, research, evidence, decision and learning	Field-building synthesis proposed for testing

6. Proposed Definition of Strategic Planning Engineering

Strategic Planning Engineering is the proposed research field devoted to the design, organisation, integration, evaluation and continuous improvement of architectures that transform strategic problems, knowledge, uncertainty, possible futures, scientific research and organisational experience into structured, evidence-aware, adaptive and revisable strategic decisions.

Its object is not the plan considered in isolation. Its object is the architecture that produces and revises the plan.

7. The Doura Strategic Planning Engineering Architecture

1. Strategic Problem Engineering

Decompose the strategic problem into symptoms, candidate causes, consequences, stakeholders, constraints, time horizons and uncertainties.

2. Knowledge Engineering

Map established knowledge, contested claims, assumptions, ignorance and strategic knowledge gaps.

3. Imagination Engineering

Generate and organise alternative futures, discontinuities and hypotheses without confusing imagined possibility with evidence.

4. Methodological Intelligence

Select, combine and revise methods according to the problem, population, time horizon and evidence requirements.

5. Directed Research

Translate strategic knowledge gaps into research questions while preserving scientific autonomy over methods, findings and conclusions.

6. Evidence Engineering

Assess methodological quality, convergence, contradiction, uncertainty, transferability and limits of the evidence base.

7. Decision Intelligence

Integrate evidence, uncertainty, objectives, values, constraints and risks into explicit and revisable decision options.

8. Strategic Foresight

Stress-test options across several plausible futures and identify robustness, vulnerabilities and contingencies.

9. Strategic Planning

Translate selected options into objectives, responsibilities, resources, indicators, thresholds and alternative pathways.

10. Action

Implement the strategy and observe both intended and unintended consequences.

11. Evaluation and Institutional Learning

Compare expectations with results, revise assumptions and convert experience into new organisational knowledge.

12. Re-engineering

Return to earlier stages when evidence, implementation or environmental change requires reformulation.

Integrated cycle

Strategic Problem -> Knowledge -> Imagination -> Methodology -> Research -> Evidence -> Decision -> Foresight -> Planning -> Action -> Evaluation -> Learning -> Re-engineering

The cycle is intentionally non-linear. Evidence can reformulate the problem; implementation can expose hidden constraints; evaluation can invalidate assumptions; and new knowledge can reopen foresight work. The architecture must therefore support iteration rather than impose sequence.

8. From Data and Big Data to Strategic Knowledge Engineering

The rise of Data and Big Data created an unprecedented capacity to collect, store and process information. Data Engineering then became necessary to make these flows reliable, structured and usable. However, technically organised data do not automatically generate strategic understanding.

The next challenge is therefore an engineering problem of transformation: how can data become knowledge, knowledge become researchable hypotheses, research become evidence, evidence become decisions, and decisions become learning?

Data -> Big Data -> Data Engineering -> Knowledge Engineering -> Strategic Knowledge -> Strategic Planning Engineering

This formulation describes cumulative layers rather than successive eras that replace one another. Strategic Planning Engineering would operate at the level where information infrastructures must be converted into collective capacities for anticipation, decision and adaptation.

9. Field-Building Criteria

A conceptual framework does not become a scientific discipline merely because it is named. For Strategic Planning Engineering to mature into an identifiable research field, it would need to satisfy demanding criteria.

1. A clearly delimited scientific object.
2. Concepts with demonstrated discriminant validity relative to neighbouring constructs.
3. Reproducible methods and transparent protocols.
4. Testable propositions capable of being contradicted by evidence.
5. Operational measures for its principal constructs.
6. Accumulated empirical findings across organisations, sectors and countries.

7. Critical replication and independent scholarly debate.
8. A body of teaching, research and application that develops beyond the original author.

10. Research Propositions

P1. Institutions with an explicit architecture for transforming knowledge into strategic questions will formulate strategic problems more precisely than institutions relying primarily on unstructured planning routines.

P2. Structured exploration of multiple futures will reduce certain forms of linear extrapolation and tunnel vision in strategic decision-making.

P3. Methodological Intelligence will improve the fit between strategic questions and research designs.

P4. Separating the strategic direction of research questions from the scientific autonomy of methods and conclusions will increase the credibility of Directed Research.

P5. Evidence Engineering will increase the transparency with which uncertainty, contradiction and transferability are represented in strategic decisions.

P6. Organisations with explicit evaluation-learning loops will revise strategic assumptions more rapidly when evidence contradicts them.

P7. Scientific specialisation will increase analytical precision but reduce systemic coherence when integration mechanisms are weak.

P8. The integrated architecture will produce measurable adaptive capabilities that are not fully explained by strategic planning, foresight or knowledge management considered separately.

11. Empirical Research Agenda

The next stage is empirical validation. A field-building programme should first test constructs separately before evaluating the complete architecture.

- Develop and validate scales for Methodological Intelligence and Decision Intelligence.
- Operationalise Imagination Engineering through diversity, novelty, plausibility and traceability of alternative futures generated before major decisions.
- Develop indicators of Evidence Engineering, including source traceability, quality appraisal, treatment of conflicting findings and explicit uncertainty.
- Compare organisations using iterative strategic-learning architectures with organisations using predominantly sequential planning processes.
- Conduct longitudinal studies of how quickly strategic assumptions are revised after disconfirming evidence.
- Test transferability across public administration, territorial development, health, infrastructure, environmental governance and firms.

12. Limits of the Present Proposal

The framework remains conceptual. Several constructs overlap with established literatures and must demonstrate discriminant value. The present antecedent search is preliminary rather than systematic. The architecture may also prove too broad unless its components can be operationalised independently. Finally, the language of engineering may be unsuitable in some institutional settings if interpreted as implying deterministic control.

These limitations are not secondary. They are precisely the conditions under which the framework should be challenged.

13. Scientific Positioning of Jamel Doura's Contribution

The literature reviewed here demonstrates clear antecedents for systems-engineering approaches to strategic planning and for each of the main component fields. Therefore, the contribution should not be presented as the

invention of strategic planning or as the first use of engineering principles in planning.

Recommended positioning: Jamel Doura proposes the formalisation of Strategic Planning Engineering as an integrative research architecture linking Strategic Problem Engineering, Knowledge Engineering, Imagination Engineering, Methodological Intelligence, scientifically autonomous Directed Research, Evidence Engineering, Decision Intelligence, Strategic Foresight, Strategic Planning, Evaluation, Institutional Learning and Re-engineering.

A historical priority claim would require a separate systematic and multilingual bibliometric investigation. Until such a study is completed, the appropriate scientific claim is one of a proposed integrative formalisation.

14. Conclusion

Science advances through both specialisation and integration. Specialisation allows researchers to isolate problems and develop precise methods; integration allows specialised knowledge to regain systemic meaning. Strategic planning increasingly depends on both movements.

The field proposed here is therefore not intended to predict the future mechanically. Its object is to study how strategic systems can be designed to understand the present, explore multiple futures, formulate better questions, preserve the autonomy of research, synthesise evidence, decide under uncertainty, evaluate action and continuously reconstruct their trajectories.

The central proposition of Strategic Planning Engineering is that the quality of a strategy depends not only on the plan that is produced, but on the architecture through which an institution learns how to produce, challenge and revise that plan.

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Author's note

This paper presents a conceptual framework intended for criticism, comparison and empirical testing. Terms introduced or redefined by the author should be treated as provisional constructs until operationalisation and independent validation establish their scientific utility.

Before formal journal submission, a full systematic literature review, terminology-priority study and independent methodological review are recommended.