



The Function of Paradigms in Scenario Methodology

Scenario 2015

Improving Scenario Methodology: Theory and Practice

December 14th – 15th



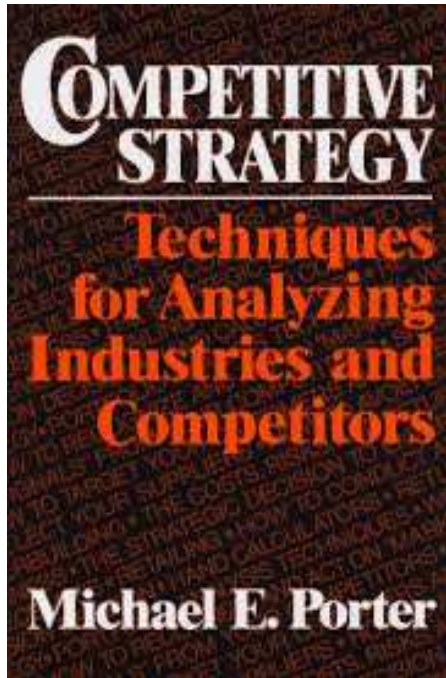
COMPETITIVE PARADIGMS

Building Business Strategies for the Future

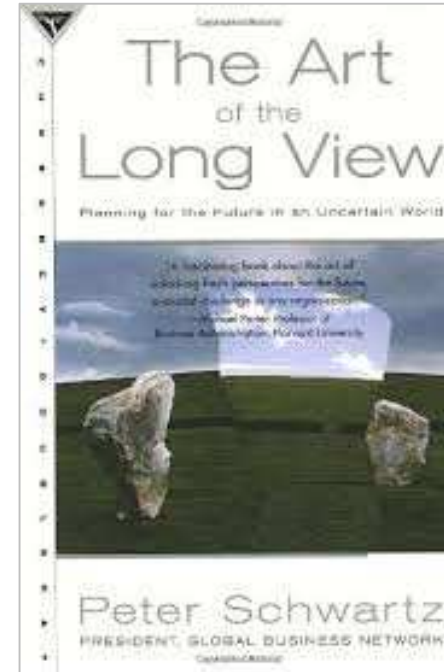
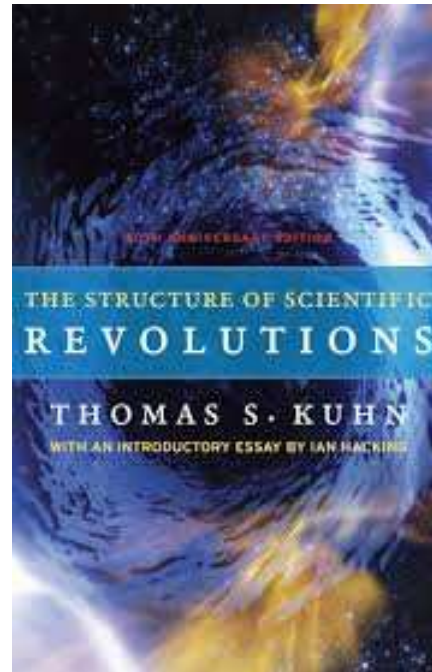




Perspectives on Corporate Strategy



McKinsey & Company





Selected Frameworks and Tools of Corporate Strategy (+ Futures + Foresight Studies + Related Fields)

How to anticipate (and to prepare for) change over time?

	Current Assessments	Processes of Change	Future Views
External Landscape	<ul style="list-style-type: none"> ▲ STEEP forces 	<ul style="list-style-type: none"> ▲ Critical theory ▲ Critical futures theory ▲ Social construction of reality ▲ Theories of change ▲ Causal layer analysis 	<ul style="list-style-type: none"> ▲ Scenario analysis ▲ Econometric modeling ▲ Diamond of national advantage
Industry	<ul style="list-style-type: none"> ▲ Business models ▲ Five forces of competition ▲ Value chain ▲ Consumer needs 	<ul style="list-style-type: none"> ▲ Stakeholder analysis 	<ul style="list-style-type: none"> ▲ Forecasting ▲ Quantitative modeling ▲ Game theory ▲ Disruptive innovation
Corporation	<ul style="list-style-type: none"> ▲ Competitive position ▲ Resource based view ▲ Activity system ▲ Value chain ▲ Dashboards 	<ul style="list-style-type: none"> ▲ Mental maps / models ▲ Strategic paradigms 	<ul style="list-style-type: none"> ▲ Visioning ▲ Real options ▲ Ambidextrous organizations



The Function of Paradigms in Scenario Methodology

A practice-based theory of paradigms improves scenario methodology by clarifying the structures of epistemological and ontological change.



- ▲ Historical developmental perspective
- ▲ Dual function generalization
- ▲ Epistemological and ontological change
- ▲ Theory choice

Thesis

The function of paradigms is to unify theory and practice
(for a particular community)

Central Questions of Method

What is their ontological status?
What is their epistemological authority?



Origins of *The Structure of Scientific Revolutions* (1962)

Thomas S. Kuhn, Summer of 1947

- ▲ **Finishing a dissertation in theoretical physics**
- ▲ **Assisting an experimental course in the history of science (Harvard President James B. Conant)**
 - Rising managerial class (soldiers returning from WW2)
 - Case-based approach rather than historical survey
 - Goal was “[t]o develop in the student some idea of the interrelation between theory and experiment and some comprehension of the complicated train of reasoning which connects the testing of an hypothesis with the actual experimental results” (Conant 1957, xvi-ii)
- ▲ **Developing a case study on Newtonian mechanics**
 - Context of “what came before”

*“I could easily believe that Aristotle had stumbled but not that, on entering physics, he had totally collapsed. Might not the fault be mine rather than Aristotle’s, I asked myself. **Perhaps his words had not always meant to him and his contemporaries quite what they meant to me and mine.**” (Kuhn 1980/2000, 16)*



Kuhn's Aristotle Experience

"Suddenly, the fragments in my head sorted themselves out in a new way and fell into place together. My jaw dropped, for all at once Aristotle seemed a very good physicist indeed, but of a sort I'd never dreamed possible. **Now I could understand why he had said what he'd said, and what his authority had been.** Statements that previously seemed egregious mistakes now seemed at worst near misses within a powerful and generally successful tradition." (Kuhn 1980/2000, 16-7)

"When the term 'motion' occurs in Aristotelian physics, it refers to change in general. . . . all varieties of change are seen as like each other, as constituting a single natural family."
(17)

"A second aspect of Aristotle's physics – harder to recognize and even more important – is the centrality of qualities to its conceptual structure. . . . **Aristotelian physics inverts the ontological hierarchy of matter and quality**
(17)

*"The conception of **motion-as-change** and the conception of a **qualitative physics** prove deeply interdependent, almost equivalent notions, and that is the first example of the fitting or locking together of parts" (18)*



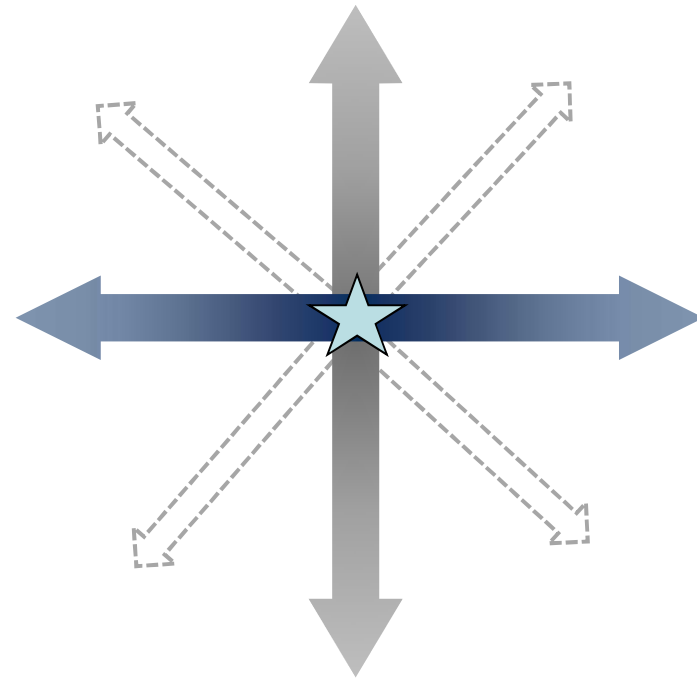
Kuhn's Historical Developmental Perspective

"...a sketch of the quite different concept of science that can emerge from the historical record of the research activity itself" (Kuhn 1962/2012, 1)

- ▲ **Historiographic accounts situated within a particular time and place**
 - Avoid "Whig" history or "textbook" history by focusing on actual practice

- ▲ **Case-based approach**
 - Concrete and crude (avoid philosophical "aetherialism")
 - Establishment of first principles inverts the (apparent) authority of practice and theory

- ▲ **Commitments of a community and boundaries of its activities**
 - "Progress" is defined and achieved through process
 - Influence of judgment over time





The Historical Development of *Structure*

"...a sketch of the quite different concept of science that can emerge from the historical record of the research activity itself" (Kuhn 1962/2012, 1)

Publications and Lectures 1948-1962

Lowell Lectures: "The Quest for Physical Theory" (1951)

"Newton's 31st Query and the Degradation of Gold" (1951)

"Robert Boyle and Structural Chemistry in the Seventeenth Century" (1952)

"The Independence of Density and Pore-Size in Newton's Theory of Matter" (1952)

"Carnot's Version of 'Carnot's Cycle'" (1955)

"La Mer's Version of 'Carnot's Cycle'" (1955)

"The Function of Measurement in Modern Physical Science" (1956/1958)

The Copernican Revolution (1957)

"Energy Conservation as an Example of Simultaneous Discovery" (1957)

"The Caloric Theory of Adiabatic Compression" (1958)

"The Essential Tension: Tradition and Innovation in Scientific Research" (1959)

"The Function of Dogma in Scientific Research" (1961)

"The Historical Structure of Scientific Discovery" (1962)

"A Function for Thought Experiments" (1964)

**Aristotle
experience**

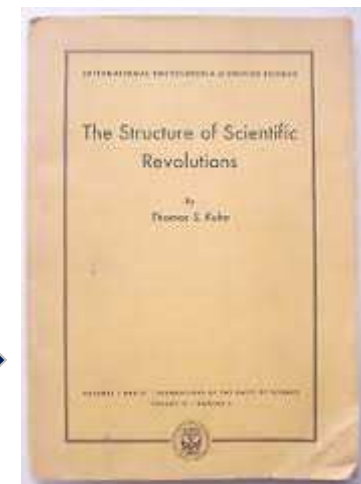
**Gestalt
switch**

Anomaly

**Incommensurability
(Different worlds)**

**Normal science
(Puzzle-solving)**

Paradigms





The Reception of *Structure*

"...a sketch of the quite different concept of science that can emerge from the historical record of the research activity itself" (Kuhn 1962/2012, 1)

▲ History of science

- "a new epistemological paradigm" (Hesse 1964)

▲ Philosophy of science

- "relativistic" (Shapere 1964)
- "irrational" (Feyerabend 1970)
- "governed by mob psychology" (Lakatos 1970)
- "a danger to science and indeed, to our civilization" (Popper 1970)

▲ Sociology of science

- "destroy[s] the authority of science" (Brown 1997)

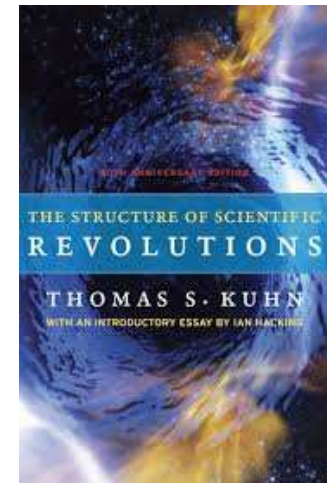
**"The concept of paradigm as shared example
is the most novel and least understood
aspect of *Structure*"**

Consensus

Shared
example

Exemplars

Disciplinary
matrix





Margaret Masterman on “*The Nature of a Paradigm*” (1970)

“...the book is at once scientifically perspicacious and philosophically obscure”

- ▲ **At least 21 different senses of “paradigm,” reflecting 3 generalized types**
- ▲ **To understand the nature of paradigm, look at what it does (i.e., its function)**
 - *Operates when the theory is not there (not primarily metaphysical)*
 - *More than habits (not primarily sociological)*
 - *Must be concrete (at least initially) – reveals the early stages of a science*

Metaphysical paradigms

- Myth
- Set of beliefs
- Successful metaphysical speculation
- “Standard” applied to quasi-metaphysics
- Organizing principle that can govern perception itself
- General epistemological viewpoint
- New way of seeing
- Something that defines the broad sweep of reality
- [Map]

Sociological paradigms

- Universally recognized scientific achievement
- Whole tradition / model
- Concrete scientific achievement
- Accepted judicial decision
- Standard illustration
- Set of political institutions

Concrete / Construct paradigms

- Textbook or classic work
- Analogy (used illustratively)
- Accepted device in common law
- Source of tools
- Type of instrumentation or device
- Anomalous pack of cards
- Machine-tool factory
- Gestalt figure that can be seen in 2 different ways

**How can a construct
become a way of seeing?**



The Use of Paradigms and Paradigm Shifts in Scenario Methodology

Metaphysical paradigms

- Tools for ordering one's perceptions
- Mental models / maps
- Patterns of belief



Changes in perceptions of reality (world views)

Sociological paradigms

- Strategic paradigms that influence action
- Established methodologies
- Values and culture
- Stakeholder perspectives



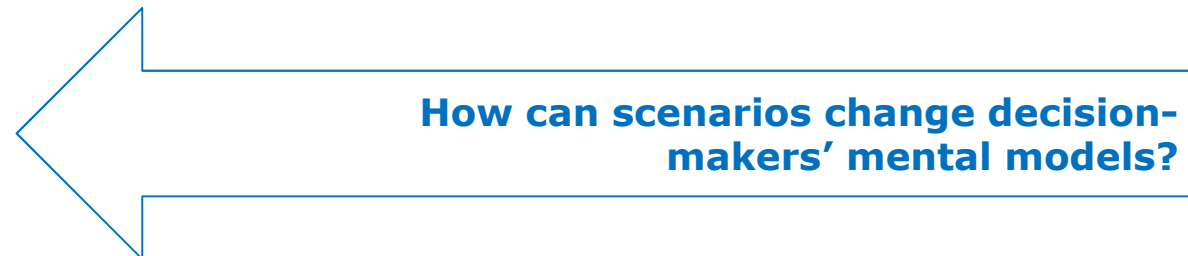
Changes in power structures, institutions, and ideologies

Concrete / Construct paradigms

- Industry structure
- Exemplars (archetypes)
- Activity systems
- Value chains

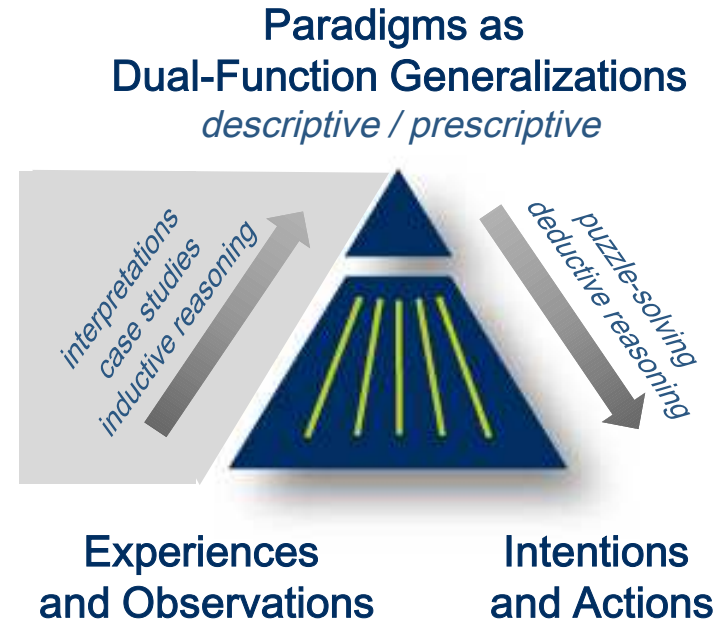


Changes in drivers, activities, operations and analyses





How Can a Construct Become a Way of Seeing? How Can Scenarios Change Mental Models?



Source: Wayland (2004).

“Post-Darwinian Kantianism”

“A Kantian with moveable categories” (Baltas et al. 1995)

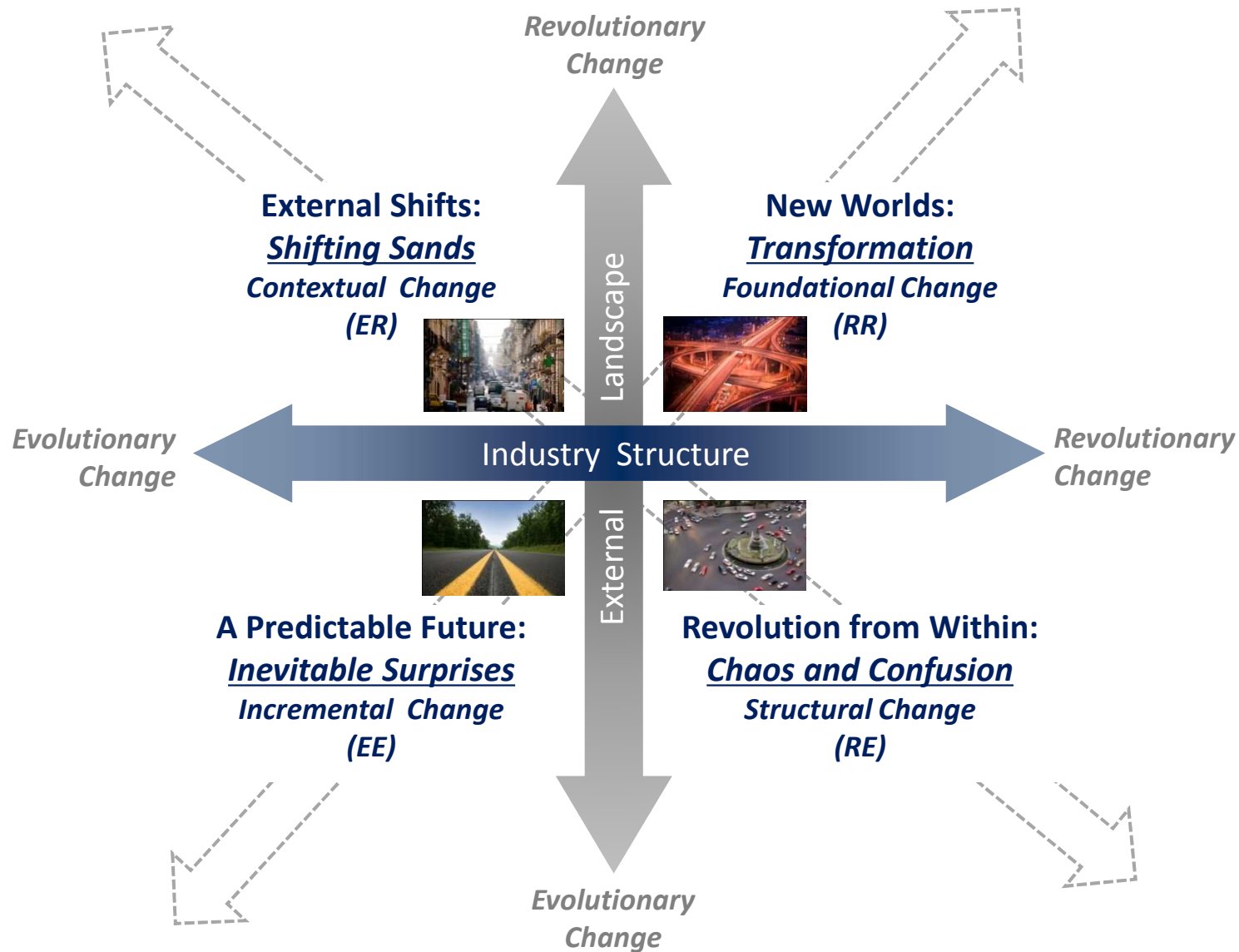
What is the epistemological basis and ontological status of scenarios?

- ❖ How do scenario projects fit established research criteria?
- ❖ What is the nature of the knowledge that results? (Walton 2008)



Corporate Scenarios for Structured Change

Concrete Paradigms to Explore the Four Types of Change

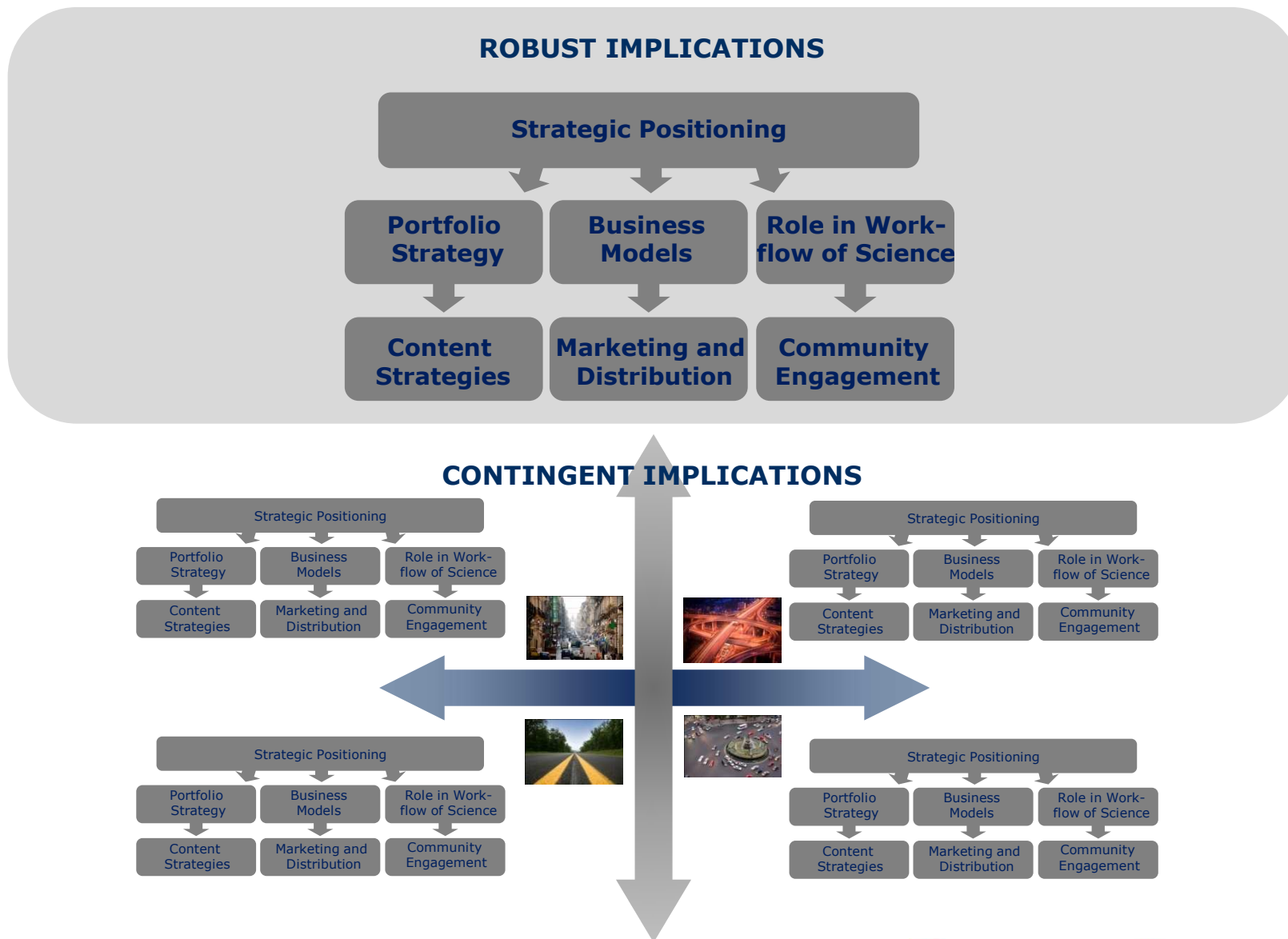


Source: Wayland (2015).



Robust and Contingent Implications

A Framework for Identifying Strategic Initiatives





Implications of Paradigms for Scenario Methodology

Paradigms are not (just) sets of beliefs - they are *practice-based* theories

Dual-function generalizations that define the world and guide puzzle-solving for a community

- ▲ **Scenario methodology must follow Wittgenstein “back to the rough ground” (i.e., away from philosophical aetherialism to the messiness of practice)**
 - Strategic tools and frameworks
 - Cross-functional / cross-regional participants
 - Wittgenstein’s ladder (and language games)
 - Accept exploration
 - Acknowledge inversion
- ▲ **Structured change scenarios provide paradigms for alternative corporate futures – and offer a paradigm for scenario methodology itself**
 - More specialized view of change: evolutionary and revolutionary change in the external landscape and/or industry structure
 - Prioritization of practice over theory
- ▲ **The four types of change define the context and focus of inductive, deductive and abductive reasoning**
 - Exploration, puzzle-solving and visioning
 - Normal and extraordinary foresight (puzzle-solving and boundary-testing)
 - Deep dive analysis by functional experts
- ▲ **Structured change scenarios provide a basis for action**
 - Robust and contingent implications
 - Overarching themes and nuanced approaches
 - Bounded flexibility and ambidexterity
 - Management dashboards
 - Early warning systems
 - Scenario toolkit for organizational roll-out



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