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Defining a typology of exploratory innovations in large-incumbent firms

A theory paper in-preparation for the Academy of Management Review

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Agenda

- Motivation
  - Topic and Gap
- Research Question
  - Significance
- Theory development
- Implications

Purpose: to get feedback for soon-to-be-submitted AMR paper

What is the common theme between these firms?

- Kodak
- Research in Motion (Blackberry)
- Motorola
- Polaroid
- Blockbuster
- U.S. Steel
- Fujifilm
- Nokia
- Sears
- Intel

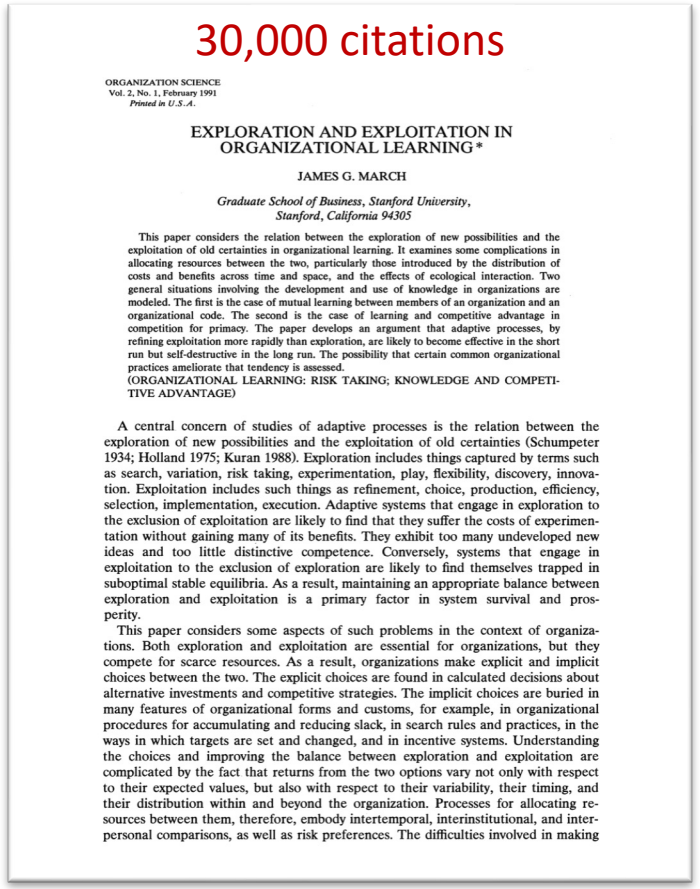
large incumbent firms

fail at non-core exploratory innovation

Agarwal and Helfat (2009); Raisch et al. (2009); Gupta et al. (2006); Sørensen and Stuart (2000); Kaplan and Henderson (2005); Tushman and O-Reilly (2008, 2010, 2011); Adner (2012); Smith and Tushman (2005); Baldwin and von Hippel (2011); Lakhani et al. (2013); Rafaelli, Glynn, Tushman (2019); O'Reilly and Binns (2019)
Gupta, A. K., Smith, K. G., & Shalley, C. E. 2006. The Interplay Between Exploration and Exploitation. Academy of Management Journal, 49(4): 693–706.

Is it surprising that large incumbents consistently fail at exploratory innovation?

30,000 citations



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EXPLORATION AND EXPLOITATION IN ORGANIZATIONAL LEARNING*

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This paper considers the relation between the exploration of new possibilities and the exploitation of old certainties in organizational learning. It examines some complications in allocating resources between the two, particularly those introduced by the distribution of costs and benefits across time and space, and the effects of ecological interaction. Two general situations involving the development and use of knowledge in organizations are modeled. The first is the case of mutual learning between members of an organization and an organizational code. The second is the case of learning and competitive advantage in competition for primacy. The paper develops an argument that adaptive processes, by refining exploitation more rapidly than exploration, are likely to become effective in the short run but self-destructive in the long run. The possibility that certain common organizational practices ameliorate that tendency is assessed.
(ORGANIZATIONAL LEARNING: RISK TAKING; KNOWLEDGE AND COMPETITIVE ADVANTAGE)

A central concern of studies of adaptive processes is the relation between the exploration of new possibilities and the exploitation of old certainties (Schumpeter 1934; Holland 1975; Kuran 1988). Exploration includes things captured by terms such as search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. Exploitation includes such things as refinement, choice, production, efficiency, selection, implementation, execution. Adaptive systems that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of its benefits. They exhibit too many undeveloped new ideas and too little distinctive competence. Conversely, systems that engage in exploitation to the exclusion of exploration are likely to find themselves trapped in suboptimal stable equilibria. As a result, maintaining an appropriate balance between exploration and exploitation is a primary factor in system survival and prosperity.

This paper considers some aspects of such problems in the context of organizations. Both exploration and exploitation are essential for organizations, but they compete for scarce resources. As a result, organizations make explicit and implicit choices between the two. The explicit choices are found in calculated decisions about alternative investments and competitive strategies. The implicit choices are buried in many features of organizational forms and customs, for example, in organizational procedures for accumulating and reducing slack, in search rules and practices, in the ways in which targets are set and changed, and in incentive systems. Understanding the choices and improving the balance between exploration and exploitation are complicated by the fact that returns from the two options vary not only with respect to their expected values, but also with respect to their variability, their timing, and their distribution within and beyond the organization. Processes for allocating resources between them, therefore, embody intertemporal, interinstitutional, and interpersonal comparisons, as well as risk preferences. The difficulties involved in making

Continuum

Exploitation ---------- Exploration

Compete for scarce tangible organizational resources

Success trap

Failure trap

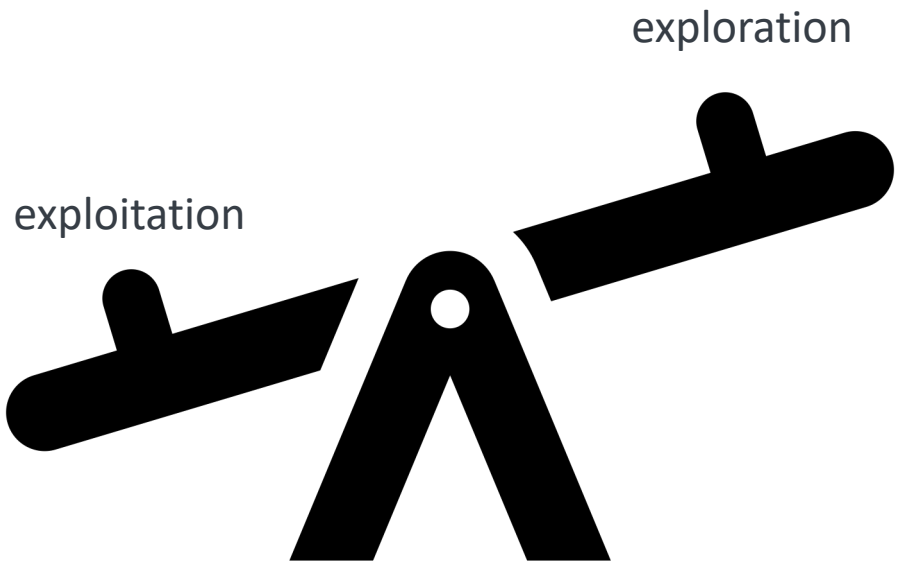
March, J. G. (1991). Exploration and exploitation in organizational learning. Organization science, 2(1), 71-87.
Gupta, A. K., Smith, K. G., & Shalley, C. E. 2006. The Interplay Between Exploration and Exploitation. Academy of Management Journal, 49(4): 693–706.

Large incumbent firms frequently reject non-incremental innovations

'biased towards exploitation because its outcomes have spatiotemporal proximity and precision' *March (1991)*

'skewed in favor of knowledge and experience' *Arthur (1984)*

Yet, exploratory innovation is key for large incumbent firms, as it drives long-term growth and competitive advantage



O'Reilly, C., & Binns, A. J. M. (2019). The Three Stages of Disruptive Innovation: Idea Generation, Incubation, and Scaling. California Management Review
March, J. G. (1991). Exploration and exploitation in organizational learning. Organization science, 2(1), 71-87.
Arthur, W. B. (1984). Competing technologies and economic prediction. IIasa Options, 2, 10-13.

Firms that do explore, typically stop before scaling-stage

Resource type	Ideation	Incubation	Scaling
Personnel	Small group R&D	Expanded R&D, Commercial, Industrial design	Dedicated R&D, commercial, industrial design, external partners, & CEO attention
Plant & Machinery	❌	Pilot plant	✅
Budget approver	R&D leader	CEO	Board of Directors
Organization redesign	❌	❌	✅
Speed of capital outflow			

O'Reilly, C., & Binns, A. J. M. (2019). The Three Stages of Disruptive Innovation: Idea Generation, Incubation, and Scaling. California Management Review

Also, not all exploration is the same

However, several studies in corporate entrepreneurship and other literatures treat exploration as one independent variable

Knowledge: Most ⟷ Least

Risk: Least ⟷ Most

‘Innovation streams’ introduced an innovation portfolio notion

They define markets using customer categories and define technology using innovation archetypes. This does not tell us much about the firm or its capability to pursue innovations

2,800 citations

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DOI 10.1287/orsc.1050.0134

Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams

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Sustained organizational performance depends on top management teams effectively exploring and exploiting. These strategic agendas are, however, associated with contradictory organizational architectures. Using the literature on paradox, contradictions, and conflict, we develop a model of managing strategic contradictions that is associated with paradoxical cognition—senior leaders and/or their teams (a) articulating a paradoxical frame, (b) differentiating between the strategy and architecture for the existing product and those for innovation, and (c) integrating between those strategies and architectures. We further argue that the locus of paradox in top management teams resides either with the senior leader or with the entire team. We identify a set of top management team conditions that facilitates a team’s ability to engage in paradoxical cognitive processes.

Key words: top management teams; innovation; exploration and exploitation; paradox; cognition

It is precisely the function of the executive to facilitate the synthesis in concrete action of the contradictory forces, to reconcile the concrete forces, instincts, interests, conditions, positions, and ideals (Barnard 1968, p. 21).

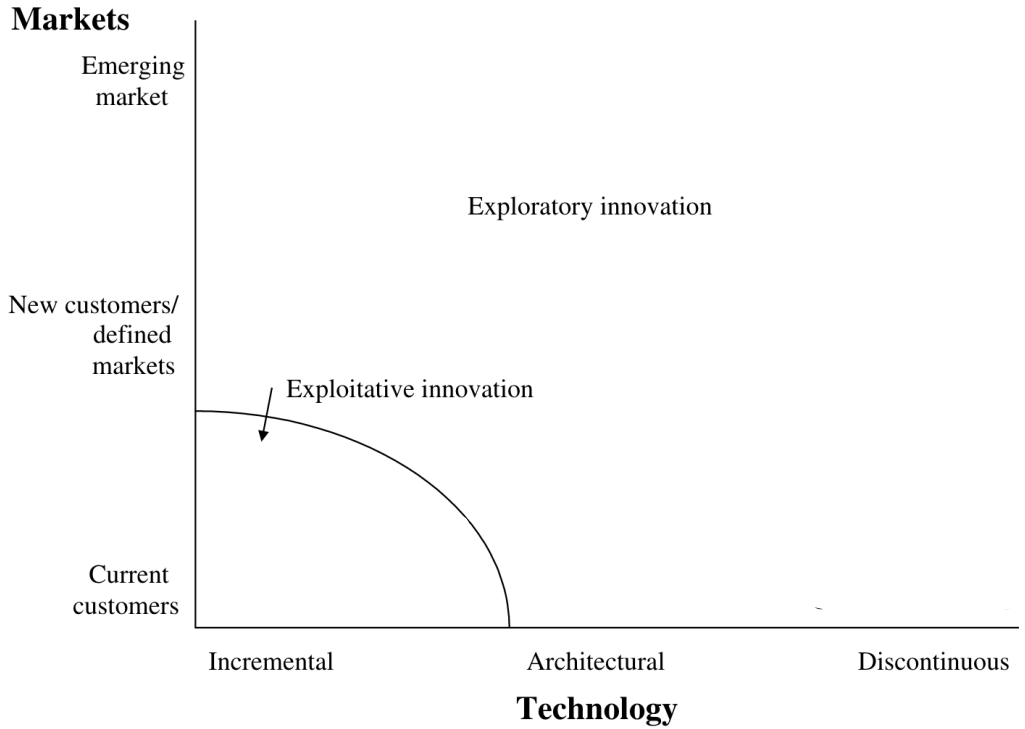
The paradox of administration [involves] the dual searches for certainty and flexibility (Thompson 1967, p. 150).

Even with Thompson’s (1967) and Barnard’s (1968) early admonitions, effectively managing strategic contradiction has not been at the center of organizational analysis. While Cameron and Quinn (1988) and Poole and Van de Ven (1989) have explicitly argued that firms must build capabilities to attend to contradictions, the theoretical and empirical work on building teams and architectures to manage these tensions has remained in our field’s periphery. However, contradictions abound. Firms are pressed to be both big and small, efficient and effective, and to operate in multiple time frames, as well as to be prospectors and analyzers (Gavetti and Levinthal 2000, Miles and Snow 1978). Similarly, senior teams are pressed to search both forward and backward, to be both flexible and focused, and to both learn and unlearn (Bunderson and Sutcliffe 2002, Flynn and Chatman 2001, Adler et al. 1999). The purpose of this paper is to encourage scholars to bring the dynamics of attending to and dealing with strategic contradiction more to the center of organization science.

March (1991) clearly articulated contradictory strategic and organizational demands on firms in his work on exploring and exploiting. He argued that organizational adaptation is rooted in balancing exploratory and exploitative activities. Too much exploiting drives inertia and dynamic conservatism; exploitation crowds out exploration (Sull 1999, Benner and Tushman 2002). Similarly, too much exploration drives out efficiencies and prevents gaining economies of scale or learning by doing (He and Wong 2004). D’Aveni (1994) similarly observed that competitive advantage is rooted in both building existing products and in creating products that cannibalize those existing products. It appears that sustained performance is rooted in simultaneously organizing for short-term efficiency as well as long-term innovation.

However, exploring and exploiting are associated with different and inconsistent organizational architectures and processes. These inconsistencies and their associated contradictory logics create fundamental organizational and senior-team challenges. Where exploration is rooted in variance-increasing activities, learning by doing, and trial and error, exploitation is rooted in variance-decreasing activities and disciplined problem solving. Where exploitation builds on an organization’s past, exploration creates futures that may be quite different than the organization’s past. Moreover, products born of exploration are often in direct competition with existing products. For example, Tripsas and Gavetti (2000) described the organizational and senior-team challenges of product substitution at Polaroid as it attempted to excel in its traditional analog technologies even as it tried to move into digital photography.

Figure 1 Innovation Map*



*Adapted from Tushman and Smith (2002).

Wendy K. Smith, Michael L. Tushman, (2005) Managing Strategic Contradictions: A Top Management Model for Managing Innovation Streams. Organization Science 16(5):522-536.

Highly motivated to study exploration typologies in large firms

Why does it matter?

Exploratory innovation is necessary for competitive advantage, but large incumbent firms are biased to exploit

Large firms regularly fail at exploratory innovation

Exploitation-Exploration is widely used as a metric to assess firm-level innovation without acknowledging the nuance of exploration types

Interesting questions

Should firms have different innovation strategy for different innovation activities?

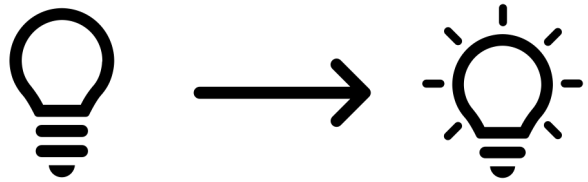
Should firms have different marketing strategy for different innovation activities?

Publication bar in the Academy of Management Review is steep

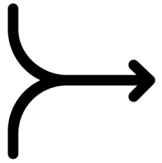
About 500 yearly submissions with a ~5-6% acceptance rate – 25 papers in a year.
Publishes only 4 types of purely theory papers.

Develop a completely new theory

Significantly enhancing existing theory



Synthesize advances into fresh if not entirely new theory



Craft ways to improve the process of theory development

AMR describes three styles for theorizing. We fall into the third

Cornelissen, J. (2017). Editor's comments: Developing propositions, a process model, or a typology? Addressing the challenges of writing theory without a boilerplate. *Academy of Management Review*, *42*(1), 1-9.

	Typology-Based Style
Definition	The specification of a typology that interrelates different dimensions to flesh out new constructs and causal interactions
Common problems with these styles of theorizing	1. Typology is empirical, rather than theoretical
	2. Typology is descriptive and does not offer multidimensional ideal types
	3. Typology only systematizes and summarizes existing research
Remedies	1. Identify whether the proposed typology has a review or theory contribution, or both
	2. Develop the typology from a theoretical angle, incorporating multiple theoretical dimensions
	3. Draw out patterns of causality (using fuzzy set reasoning) and explicate the basic line of argument

Attributes of Each Style	**Proposition-Based Style**	**Narrative-Based Style**	**Typology-Based Style**
Definition	The statement of theoretical propositions that introduces new constructs and cause-effect relationships	The specification of a process model that lays out a set of mechanisms explaining events and outcomes	The specification of a typology that interrelates different dimensions to flesh out new constructs and causal interactions
Recent example in *AMR*	Ashforth, Schinoff, & Rogers (2016)	Hardy & Maguire (2016)	Creary, Caza, & Roberts (2015)
Core idiom—basic expectations	A formal idiom that formalizes contingencies around a subject into basic cause-effect relationships that act as broad signposts and implications for further research	A narrative idiom that explains an important subject and its potential outcomes around a generalized mechanism, as the underlying storyline of a process model	A categorization idiom that explains the fuzzy nature of many subjects by logically and causally combining different constructs into a coherent and explanatory set of types
Common problems with these styles of theorizing	1. Propositions are too narrow in scope and summarize the prior literature (as summary statements)	1. Narrative and process model are too descriptive	1. Typology is empirical, rather than theoretical
	2. Propositions are modeled on hypothesis testing	2. Narrative and process model lack explanatory detail	2. Typology is descriptive and does not offer multidimensional ideal types
	3. Propositions include multiple clauses	3. Narrative features stylized arguments and claims (lacking nuance and contingent variation)	3. Typology only systematizes and summarizes existing research
	4. Propositions lack detail on the causal agent	4. Narrative features complex compounds and phrases as constructs	4. Typology features various degrees of causal entanglement (including circularity and tautology)
Remedies	1. Broaden the scope of the propositions and develop an original line of argument, with a novel set of assumptions as theorized grounds	1. Elaborate the underlying conceptual linkages of a process model, foregrounding a clear mechanism or set of mechanisms	1. Identify whether the proposed typology has a review or theory contribution, or both
	2. Develop the arguments first, before formalizing them into propositions	2. Add details and more contingent variation to the overall narrative, strengthening its explanatory potential	2. Develop the typology from a theoretical angle, incorporating multiple theoretical dimensions
			3. Draw out patterns of causality (using fuzzy set reasoning) and explicate the basic line of argument

Theory Development – X-axis

Increasing value creation uncertainty

When technology is

- New to the world
- New to the company
- Known to the company

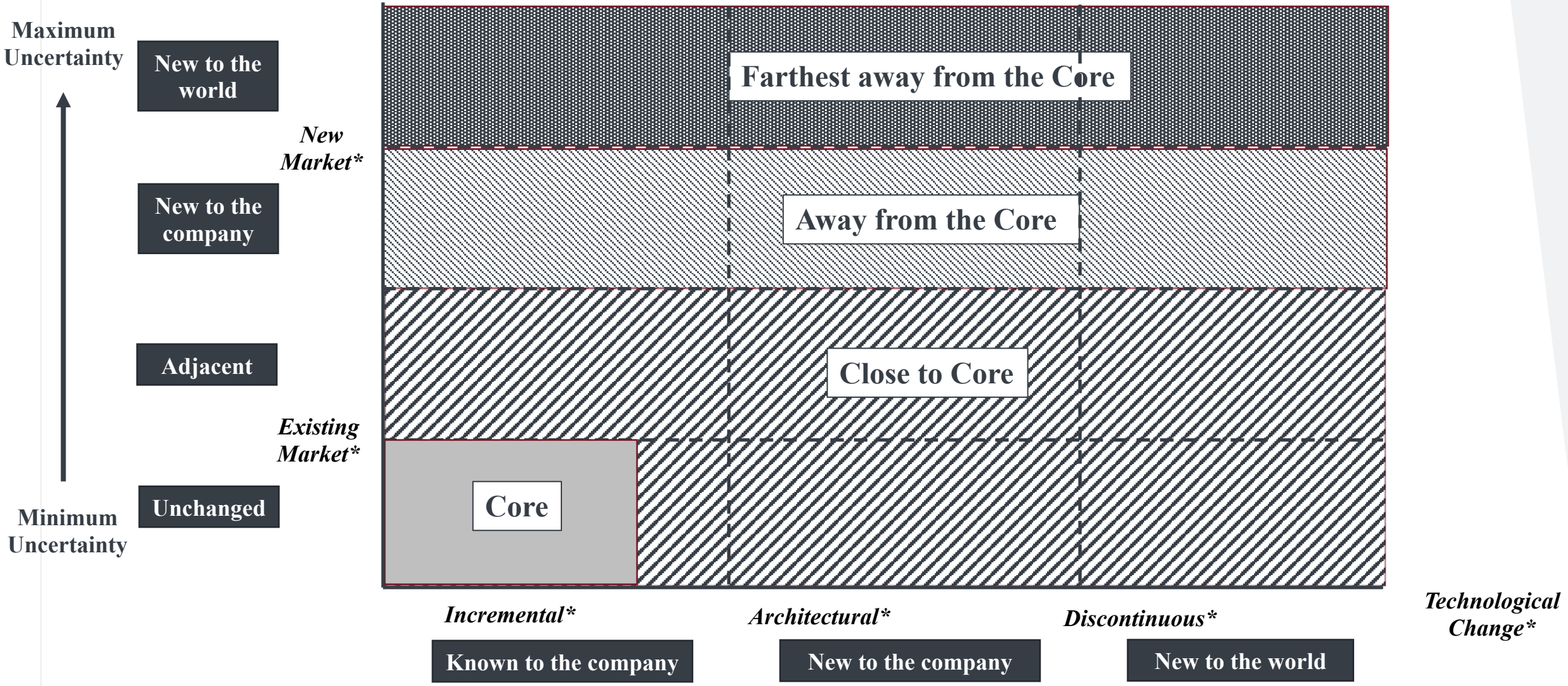
Theory Development – Y-axis

Increasing value creation uncertainty

When business model / customer / market are

New to the world	Underdeveloped opportunity
New to the company	Underdeveloped opportunity
Adjacent	Underdeveloped opportunity
Unchanged	Fully-developed opportunity

* *Tushman et. al. 2010*



Implications of reframing innovation streams extend to several management domains

Implications for theory and empirical studies related to

- corporate entrepreneurship and strategy
- strategy and organization design
- marketing
- management and leadership

- where to play?
- Pursuing new business models
- Product category reinventing innovations
- Implementing organizational ambidexterity

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Thank You

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