

## Teaching Note

# The T-M-O Framework: Strategic innovation across technology, markets, and organization

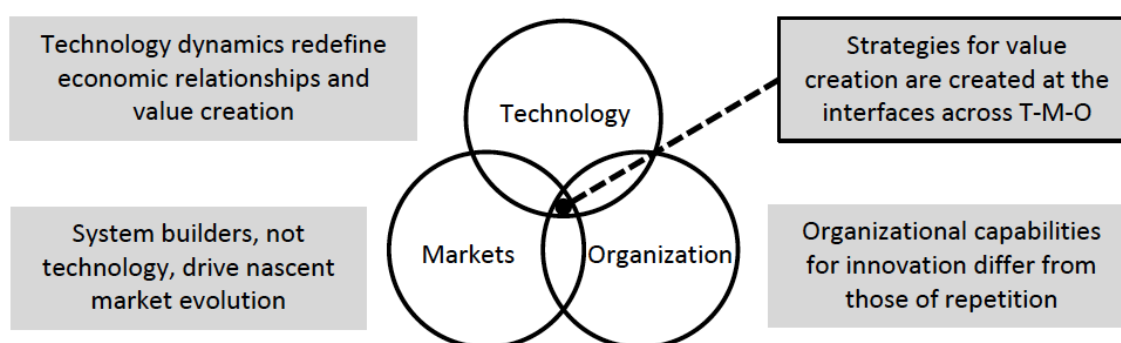
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## Introduction

How to lead on innovation strategy in times marked by complex emerging technologies, dramatic changes in both markets and wider global politics, and changed demands on organizations in every sector to deliver on value creation and value capture? This note provides an overview of integrative framework developed as part of the content of the Oxford Diploma in Strategy & Innovation, Module 2: Innovation Strategy.

Researchers, experienced executives, and innovation gurus provide a rich array of frameworks that help ground this challenge of leading and managing innovation. In this Note we outline the Oxford-sourced toolkit for this work. We introduce an integrated approach incorporating research and practice on **T**echnology Dynamics, **M** nascent Markets, and **O**rganization Capabilities, a framework we summarize as **T-M-O**.

In contrast to past approaches that attempt to find the “one best way” to develop a strategic approach to innovation, our work leads us to advocate managers thinking and integrating across and between three intertwined bodies of research on technology, markets, and organizations (Figure 1).



**Figure 1: T-M-O Framework for innovation strategy analysis and action**

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The starting point for this work is the Schumpeterian challenge to neoclassical economic arguments: This work often goes by the name ‘innovation economics’ and proposes a challenge view of how technology innovation drives the evolution of new markets, in ways that ‘supply and demand’ cannot account for. We note this shift from comparative statics to approaches that grapple and harness flux.

A technological perspective on innovation strategy focuses on analyzing and understanding the evolution of technology performance, where emerging technologies can define new economic and social relationships. A markets perspective highlights the process, challenges, and opportunities of new market creation, where “system builders” do not segment markets but rather drive new market evolution to meet new objectives (Thompson, Purdy, and Ventresca, 2018). These nascent markets are characterized by much ambiguity and incomplete rules of the game, a critical challenge for both entrepreneurs and managers in incumbent firms.

The organization perspective has focused on capabilities needed for continuous innovation, where such capabilities differ from those of already routine activities and repetition of current processes. Importantly, today, the increasing prominence of platforms, so-called ‘ecosystems’ and open strategy and open innovation underscore the importance of recognizing and building relevant, often novel capabilities within a firm or agency and across boundaries. We advocate that some of the most interesting opportunities for value creation will fall at the interfaces between these three sets of tools. By travelling across all three toolkits, drawing on underlying models as needed, iterating that analysis over time, the T-M-O makes available new approaches and plural solution strategies.

### ***What the T-M-O framework is—and what it is not***

The T-M-O Framework integrates a range of literatures and insight-generating tools for practical action. We consolidate these into the three ‘anchor’ ideas of technology dynamics, nascent markets, and organization capabilities to underscore these different starting points and the complementary analysis for leading on innovation. T-M-O is not itself a single stand-alone model, but rather a structured compendium of time-tested, relevant models, each of which helps to answer different questions. Our integration and assembly of these for the Diploma is a ‘living’ tool kit that you will use, adapt, and in turn tell us about what works.

The current expertise in innovation strategy is still plural, with no single composite tool or approach. Hence, unlike a “Five Forces” industry structure analysis, it is not a single framework tool to plug in and get a succinct assessment of the potential for value creation in an unsettled activity space. Recall that ‘innovation’ itself varies in scale, whether focused on a corporate new product development process, on defining a new business model, or engaged with more large-scale societal innovation activity. Rather, the T-M-O is an umbrella framework that provides you a set of resources for analysis that you learn to use judiciously and selectively. T-M-O directs us to use a range of models and tools when analyzing a market in the making or other unsettled space.

Below, we provide a brief historical perspective the value of such integrated toolkit framework, then describe each of the constituent elements more in turn.

## Historical Background

It is well established that organizations of all sorts need an innovation strategy to effectively use resources invested to realize intended innovations (Pisano, 2015). Rather than rely on a single model or 2x2 matrix, we have found that becoming familiar with a broader range of frameworks leads to the most important insights and conversations within a management team. Innovation can follow somewhat predictable patterns, such as in the patterns of firm entry and exit in the motorcar industry as documented by Geroski (2003), and so it is important to understand these typical patterns of the evolution of new markets as a first order process.

While stable markets are structured, institutionalized arenas of exchange where there is competitive interaction among stable actors (firms), roles (producer and consumer), and products, nascent markets are characterized by high ambiguity and rapid change. Nascent markets have an unclear product definition, unclear industry structure and unclear logic for market actions. Most innovation contexts are characterized by such dynamics, where both content and requirements remain to be explored. To understand such nascent market contexts, you will want to complement the insights of innovation economics (Geroski, 2003) with an approach informed by other research approaches and disciplines.

This is the genesis of the T-M-O framework: We have assembled complementary tools and concepts for full analysis of innovation, that guide action for impact. For example, the concept of “competitive advantage” in strategy is giving way to a focus on distributed ecosystems and implementation for value creation and value capture. The interplay of emerging technologies, market institutions, and organization capabilities is critical for understanding this shift, both in concept and in practice.

### The three perspectives: T-M-O

To help describe how the T-M-O Framework serves to point to questions across a number of analytic perspectives. Table 1 provides an overview of the three elements along with classic research studies that develop each toolkit. We recognize that no study is grounded only in the perspective upon which we anchor it. For example, studies of “technology” are naturally concerned with organizational capabilities to develop the technology and convert that ‘bundle of possibilities’ into innovation. However, many scholarly studies of innovation arguably have had a primary grounding in either technology dynamics, nascent markets, or organizational capabilities.

#### *Technology Dynamics*

Those studies and models centered on the technological perspective has been concerned with patterns of the evolution of innovations, driven by the cumulative application of new knowledge. An exemplar of this strategic management model would be Foster’s (1986) S-curve of technological performance, which helps us to gain a perspective on the main phases a technology will travel through, with associated implications for firms seeking to compete in different phases. Other work in this field includes work on dominant designs, the setting of standards, along with other themes. Some of the main questions and related scholars associated with this perspective are listed in the table.

### ***Nascent Markets***

Those studies and models centered on the market perspective have been concerned with the challenges and opportunities associated with early markets and markets in the making when compared with market analysis, segmentation, and associated themes. From Geroski's work on the general dynamics of new markets to more recent work on how new categories are identified and created, this body of research takes the market creation process as fundamental.

In this perspective, markets are complex systems of rules, categories and conventions that have histories. Studies that have importance here deal with the questions of how do markets get built? Who are the system builders and what key cultural-political processes are involved? What linkages are there between market development and technological innovation? How do categories and conventions solve key questions of ambiguity in market information? An increasing area of focus in this domain is on network strategies in shaping markets and on the role of intermediaries (Obstfeld, Ventresca and Fisher, 2020). Scholarly work on how entrepreneurs use social networks to claim, demarcate, and control new markets has been important in forming this perspective (Santos & Eisenhardt, 2009), as well as how these skills and efforts engage with wider networks of resources, rules, and relationships.

### ***Organizational Capabilities***

Finally, the organizational capabilities line of research has traditionally been concerned primarily with what firm-level practices lead to sustained innovative activity, and how these practices need to shift when we move from routine work to more exploration-focused efforts. Increasingly the organizational form includes the work of online communities in innovation, and so "organizational capabilities" can include how organizations partner with new forms of organizing as a means to promote sustained innovation (Reidl et al, 2020) and important work on the role of platforms. Table 1 summarizes example research questions in this tradition.

While classic strategy and organization theories dealt with issues of designing an optimal organization, increasingly the focus has been on inter-organizational issues and organization-community interfaces through the work on platforms, open innovation, and ecosystems. A designer's toolkit has increasingly been employed across these levels as well, affording new opportunities for value creation (Seidel & Fixson, 2015).

Moving across the toolkits of T-M-O has the opportunity for value creation due to the multiplicative ways in which elements can interact across these domains, which we sometimes illustrate in shorthand as

$$\text{Value creation} = f[\text{Technology dynamics} \times \text{nascent Markets} \times \text{Org capabilities}]$$

Some of the most transformative organizations do not work from a toolkit in only one domain, but their leaders are working across these three areas in a way that amplifies their effect.

**Table 1: Examples of innovation strategy questions addressed across Technology, Market, and Organization toolkits**

<i>Toolkit:</i>	<b>Technology Dynamics</b>	<b>Nascent Markets</b>	<b>Organizational Capabilities</b>
Example questions each perspective addresses	<ul style="list-style-type: none"> <li>– How does technological performance evolve? (Foster, 1986)</li> <li>– How do “dominant designs” become established (Anderson &amp; Tushman, 1990)</li> <li>– What is the role of architectural innovation? (Henderson &amp; Clark, 1990)</li> </ul>	<ul style="list-style-type: none"> <li>– How do new technology markets get their innovations adopted? (Rodgers, 2003)</li> <li>– How does one claim, demarcate, and control a nascent market? (Santos &amp; Eisenhardt, 2009)</li> </ul>	<ul style="list-style-type: none"> <li>– What range of practices support innovation? (Tushman &amp; O’Reilly, 2002)</li> <li>– How is knowledge brokered? (Hargadon &amp; Sutton, 2000)</li> <li>– How to best use communities (Reidl et al. 2020, Boudreau &amp; Lakhani, 2009)</li> <li>– How design gets adopted? (Seidel &amp; Fixson, 2015)</li> </ul>

***Where to start?***

When analyzing a context of innovation, one question that is often asked is where does one start: in analyzing the technology, in understanding market evolution, or at uncovering organizational capabilities? There is no one starting point when applying the T-M-O Framework, as any one area might be the appropriate beginning. For example, a new technology may emerge in one’s industry that causes one to first understand where it fits within the Technology S-curve model (Foster, 1986), using this to then consider elements of its market adoption and what organizational capabilities will be most important in commercialization. Other examples may start with the standpoint of a new organizational form creating new opportunities for repeated innovation. The important aspect to keep in mind is that whatever the starting point for your investigation, the framework suggests that a complete analysis uses underlying models from across T-M-O.

**Concluding Remarks: The right questions, not the “right” answers**

Any good strategic tool doesn’t promise to give the “right” answers in a complex, often unsettled strategic context, but rather a tool points us toward ‘better’ questions – questions that help us see and engage the complexity of an evolving situation. This is true of the T-M-O Framework as well, as an umbrella framework that calls us to draw upon plural disciplines and approaches. By travelling through the elements T-M-O, one can find new insights that prompt you to raise different questions, then puzzles on the range of challenges in fresh ways to come to an actionable strategy in an emergent or changing innovation context.

## References for prior work relevant across the T-M-O perspectives

- Anderson, P., & Tushman, M. L. (1990). Technological discontinuities and dominant designs: A cyclical model of technological change. *Administrative Science Quarterly*, 604-633.
- Boudreau, K. J. & Lakhani, K. R. (2009) 'How to Manage Outside Innovation', MIT Sloan Management Review, 50(4): pp.69-76.
- Foster, R. (1986). *Innovation: The attacker's advantage*. New York: Summit books
- Geroski, P. (2003). *The evolution of new markets*. New York: Oxford University Press
- Hargadon, A., & Sutton, R. I. (2000). Building an innovation factory. *Harvard Business Review*, 78(3), 157-157.
- Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 9-30.
- Obstfeld, D., Ventresca, M., & Fisher, G. (2020). An assembly perspective of entrepreneurial projects: social networks in action. *Strategic Entrepreneurship Journal*, forthcoming.
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93(6), 44-54.
- Riedl, C., Seidel, V. P., Woolley, A. W., & Kane, G. C. (2020) Make Your Crowd Smart, *Sloan Management Review*
- Santos, F. M. & Eisenhardt, K. M. (2009) 'Constructing Markets and Shaping Boundaries: Entrepreneurial Agency in Nascent Fields', *Academy of Management Journal*, 52(4): pp.643--671.
- Seidel, V. P. & Fixson, S. K. (2015) 'Design-Thinking for Non-Designers: A Guide for Team Training and Implementation', in *Design Thinking: New Product Development Essentials from the PDMA* K. Scott Swan, Michael Luchs, and Abbie Griffin (Eds.), New York: Wiley, 2015
- Thompson, T. A., Purdy, J. M., & Ventresca, M. J. (2018). How entrepreneurial ecosystems take form: Evidence from social impact initiatives in Seattle. *Strategic Entrepreneurship Journal*, 12(1), 96-116.
- Tushman, M. L., and C. A. O'Reilly (2002) *Winning through Innovation: A Practical Guide to Leading Organizational Renewal*, Harvard Business Review Press.