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**STRATEGY TOOLS-IN-USE: A FRAMEWORK FOR UNDERSTANDING
'TECHNOLOGIES OF RATIONALITY' IN PRACTICE**

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STRATEGY TOOLS-IN-USE: A FRAMEWORK FOR UNDERSTANDING 'TECHNOLOGIES OF RATIONALITY' IN PRACTICE

Abstract: In response to critiques of strategy tools as unhelpful or potentially dangerous for organizations, we suggest casting a sociological eye on how tools are actually mobilized by strategy makers. In conceptualizing strategy tools as tools-in-use, we offer a framework for examining the ways that the affordances of strategy tools and the agency of strategy makers interact to shape how and when tools are selected and applied. Further, rather than evaluating the 'correct' or 'incorrect' use of tools, we highlight the variety of outcomes that result, not just for organizations but also for the tools and the individuals who use them. We illustrate this framework with a vignette and propose an agenda and methodological approaches for further scholarship on the use of strategy tools.

STRATEGY TOOLS-IN-USE: A FRAMEWORK FOR UNDERSTANDING 'TECHNOLOGIES OF RATIONALITY' IN PRACTICE

In business schools, when we teach strategy we introduce students to various strategy tools – such as Five Forces (Porter, 1980), strategic group maps (McGee and Thomas, 1986), or the BCG growth-share matrix (Henderson, 1979). Research suggests that managers use such tools to support situation analysis and evaluation of strategic choices (Grant, 2003; Orndoff, 2002; Tapinos *et al.*, 2005). Managers use tools in what they consider to be rational processes of strategic decision-making (Cabantous and Gond, 2011; Jarratt and Stiles, 2010). Yet, March (2006: 211) (and others such as Mintzberg, 1994; 2004) critique an excessive trust in these ‘technologies of rationality,’ as potentially inappropriate props for decision making that ‘defend a utopia of the mind against the realism of experience.’

Bridging this gap between the ‘utopia of the mind’ (the theory of how strategy tools should be used) and the ‘realism of experience’ (how managers actually use tools) falls squarely into the strategy-as-practice research agenda (Balogun *et al.*, 2007; Golsorkhi *et al.*, 2010; Johnson *et al.*, 2007; Orlikowski, 2010; Vaara and Whittington, 2012). To address this challenge, Whittington (2007: 1577-1578) suggests we take a ‘sociological eye’ to strategy, examining not only specific tools or actors, but also the rich interactions within which people and ‘things’ are engaged in doing strategy work. A sociological eye encourages close attention to tools as they are used in context, the motivations of actors in using them, the purposes to which tools are put, and their potential to lead to an array of sometimes unanticipated outcomes. In this paper, we develop a framework for seeing strategy tools through such a lens, probing their selection, their application and the outcomes associated with their use. To gain traction on this agenda, we treat strategy tools as tools-in-use, much as research on technology has approached ‘technologies-in-use’ (Orlikowski, 2000; Orlikowski and Barley, 2001).

The term ‘tool’ is a generic name for frameworks, concepts, models or methods. The

purposes of our paper, we focus specifically on strategy tools, such as Porter's Five Forces, that codify knowledge about strategy-making within structured approaches to strategy analysis, often through some form of propositional or visual representation (March, 2006; Worren *et al.*, 2002). We focus on these tools because they embed particular content and methods for structuring thinking that may have implications for the practice of strategy (Worren *et al.*, 2002). March (2006) calls these tools 'technologies of rationality' because they offer models of causal structures, provide spaces for collecting data, and establish decision rules for selecting among alternatives. That is, the tools support what Simon (1978: 9) calls 'procedural rationality' to help actors make rational choices for the firm given the limits of human cognitive powers (Cabantous and Gond, 2011).

Strategy tools are intended to be useful in coping with the uncertainties associated with strategy making. Yet, March (2006: 203) claims that it is precisely in periods of greatest uncertainty that use of such tools can be inappropriate: decision-making 'disasters' may stem from the oversimplification or misrepresentation encoded in tools. He argues that technologies of rationality are less reliable where the environment is uncertain, the situation is causally complex, preferences are ambiguous, or there are important interpersonal tradeoffs (March, 2006: 208). Managers may make inapt use of tools by getting the 'wrong' information or overlooking important variables. They may also use tools for rhetorical purposes to justify positions that support their political interests. Such actions are cast as failures (or even deliberate distortion and deviance) in using tools, which can lead to poor strategic outcomes.

From a practice perspective, the search for such individual- or organizational-level rationality can be seen as a product of a Western culture that values rationality as a supposedly neutral basis of thought and action (Cabantous and Gond, 2011; Feldman and March, 1981; Langley, 1989). That is, rationality is a normative ideal that gets instantiated through the

practices of individuals intending to be rational as they make strategy. Following this approach, we seek to examine the practices of individuals working with tools in the context of this normative ideal. In doing so, we portray strategy tools as fluid objects that, through their selection and application by particular actors in particular contexts, produce a variety of outcomes for different stakeholders, including the degree of exploration provoked, resolution achieved, satisfaction with the process, discretion or competence of the actor, and routinization of the tool in an organization's practice. Our approach suggests that evaluating the correct (and rational) or incorrect (and 'irrational,' at least according to some definitions) use of tools is a problematic dichotomy that obscures the multiple outcomes relevant to managers and organizations and directs attention away from the dynamics involved in using such technologies of rationality.

We draw on emerging research on strategy tools to highlight what is known and unknown and then illustrate the dynamics of strategy tools-in-use through a vignette. Our framework informs a research agenda that directs us to examine the actors using strategy tools, the multiplicity of potential outcomes and the social processes that produce them. Further, this framework can help developers of strategy tools understand the affordances (possibilities and constraints) that such tools create. And it can help teachers position strategy tools not simply as answers to specific problems but as parts of complex organizational processes that involve both individual and organizational objectives.

A FRAMEWORK FOR STRATEGY TOOLS-IN-USE

We apply a practice lens to develop a framework of strategy tools-in-use (Figure 1). In this section, we outline the implications of a practice lens on understanding *tools* and the *actors* who use them and then, in the next section, explain how tools and actors interact in the selection, application and outcomes of tools-in-use (Arrows 1-6 in Figure 1). We describe each of the

elements of the framework with reference to existing literature and develop a series of statements about the way these relationships work (as catalogued in Table 1). The statements explicate the association between tools and actors based on the evidence we have or can infer from current research and also provide the grounds for an empirical research agenda on tools-in-use. The framework also highlights the feedback loops through which selection, application and outcomes shape each other (Arrows A-C in Figure 1). While a practice lens suggests that these relationships are important, little is known about their role. In a subsequent section, we offer supplemental statements as a starting point for future explorations of these recursive dynamics.

-- Insert Figure 1 and Table 1 about here --

Research on strategy tools *per se* is limited. Much of the early interest was in practitioner-oriented journals. Only more recently, as part of the strategy-as-practice movement, studies of strategy tools have begun to penetrate the periphery of scholarly journals. Therefore, to develop these statements, we benefit from studies of related tools and techniques (e.g., Balanced Scorecard, formal analysis), other enabling technologies (e.g., PowerPoint, meetings, off-site ‘away days’), and, more broadly, formal analysis, accounting practices, and technologies-in-use.

Affordances of tools

As with technologies-in-use, a practice lens highlights that strategy tools come with affordances that enable and constrain their use (Orlikowski and Scott, 2008). By affordances, we mean that, as Zammuto *et al* (2007: 752) say, ‘the materiality of an object favors, shapes or invites, and at the same time constrains, a set of specific uses’ (see also Orlikowski and Scott, 2008). For example, a chair may be intended as a seat, but actors may use it as a stepping stool, a coffee table, a barrier to keep a child away from a fireplace, a bookshelf, etc. (but not likely as a pen, a window shade or a cook stove). The use depends not only on the material properties, nor on the intended design of the tool, but also on the context and the interpretations of actors who may use

the technologies in creative, unpredictable ways (Faraj and Azad, 2012; Jarzabkowski and Pinch, 2014). The literature on affordances emphasizes that tools and technologies are as much conceptual as material devices through which actors pursue multiple ends, such as negotiating about the content of PowerPoint slides (Kaplan, 2011) or using Blackberry devices to manage workflow (Mazmanian and Orlikowski, 2013). We are encouraged to consider the way tools and technologies provide interpretive, as well as material, affordances for action (Darr and Pinch, 2013).

Strategy tools, similarly, have both material and conceptual affordances that shape their use. Strategy tools come with choices embedded in them about what knowledge to privilege. Researchers have suggested that the content of artifacts ‘disguise[es] itself as information, rather than argument’ (Meyer *et al.*, 2013: 6). By implication, a strategy tool is not neutral or ‘objective,’ but makes an argument about what is important to analyze strategically and, conversely, what is not. For example, critiques of Porter’s Five Forces have claimed that, by featuring buyers, suppliers, barriers to entry, substitutes and rivalry, the tool may direct managers away from exploring other industry dynamics such as complementors (Brandenburger and Nalebuff, 1996). While the designers of tools may intend them to be selected for particular tasks, to be applied in certain ways and to achieve certain outcomes, these intentions may or may not be realized as actors engage with the tools. Actors’ perceptions of a tool’s affordances will shape its use such that tools should not be understood separately from their use (Orlikowski, 2000, 2010; Orlikowski and Scott, 2008).

For example, Chesley and Wenger’s (1999) study of the Balanced Scorecard shows that many features – from the labels to the meanings attributed to different boxes in the worksheet – may be altered during use. Sometimes these changes are done to reflect the specifics of a particular situation, but they are also made by individuals wishing to guide conversations in

particular directions. As accounting scholars have demonstrated, changes in an accounting framework or metric may be manifestations of the interpretations and interests of different actors (Feldman, 2004; Gephart, 1997; Nahapiet, 1988; Power, 2003). We can infer from these studies that tools have affordances that shape the way that actors frame problems but can also enable actors to advance their own interests in that problem.

Agency of actors in using tools

In conceptualizing tools ‘in use,’ we necessarily highlight the actors who use them. A practice lens draws attention to what actors do as they make strategy (Vaara and Whittington, 2012) and emphasizes that people ‘enact technologies in multiple ways’ (Boudreau and Robey, 2005, p. 4). March (2006) conceptualizes tools as ‘technologies of rationality’ based on assumptions of procedural rationality: individuals, even though cognitively limited, ‘attempt to collect the information necessary to form expectations about various alternatives, and [use] this information in the final decision’ (Dean and Sharfman, 1993: 1071). In this view, people make strategic choices based on some ‘model-based assessment of the likelihoods of different possible future outcomes and of preferences among them’ (March 2006: 203). These preferences may be associated with the best interests of the firm (where political action would be seen as irrational) or with the best interests of the individual decision maker (where political action can be seen as rational) (Dean and Sharfman, 1993).

A practice lens offers an alternative view of the achievement of rationality. It suggests that, when making strategy, actors are seeking to conform to the normative ideal of rationality (Cabantous and Gond, 2011; Langley, 1988) where the use of strategy tools is part of that rationality-seeking process. Using tools may enable actors to feel rational (Pondy, 1983) and to convey an appearance of rationality to others (Feldman and March, 1981). Therefore, while a practice lens calls into question March’s (2006) characterization of strategy tools as

‘technologies of rationality,’ it recognizes that they can function as technologies of *intended* rationality, or ‘rationality carriers’ (Cabantous and Gond, 2011: 577; Dodgson *et al.*, 2013). Further, using a strategy tool signifies the user as a strategist, able to conform to and perform within the wider norms and discourses of strategy making (Knights and Morgan, 1991).

Research on users of strategy tools has focused primarily on senior executives (Frost, 2003; Stenfors *et al.*, 2007). Those at the top of the organization are likely to have hierarchically derived power to choose tools – consciously or unconsciously – and control their application (Hill and Westbrook, 1997; Hodgkinson *et al.*, 2006). However, a practice lens directs us to consider the wide variety of actors involved in strategy-making, not just top managers, but also middle managers and those outside the organization, such as consultants (Whittington, 2007).

Middle managers are likely to see strategy tools as a way to engage in strategy conversations laterally across divisions (Balogun and Johnson, 2004) or to influence upwards (Floyd and Lane, 2000; Mantere and Vaara, 2008). Senior managers may regard tools as a means of conveying information and presenting positive images of a strategy (Grant, 2003; Ketokivi and Castaner, 2004; Mantere and Vaara, 2008). Consultants might regard the use of tools as a professional skill that gives them status and expertise to act across organizations (McKenna, 2006). Research on strategy making implies that the outcomes of using tools will include not only their effectiveness for problem-solving but also the returns that may accrue to actors from their use, e.g., demonstrating competence as a strategist (Mantere, 2008), gaining support for particular views (Kaplan, 2008) and resolving interpersonal and political differences (Eisenhardt and Bourgeois, 1988; Pettigrew, 1977).

STRATEGY TOOLS-IN-USE: SELECTION, APPLICATION AND OUTCOMES

Actors and tools interact in the selection, application and achievement of outcomes associated with the tools-in-use. While the developers of tools may design them with specific types of

strategic problems in mind, it is not clear that managers inside organizations pick or use tools for these reasons. There is much to suggest that the choice of tools is shaped by actors' competence in their use, power in their organization, and their boundedly rational satisficing where, in many cases, a wide variety of tools would be considered suitable for a particular strategic issue.

Similarly, tools are not only applied to solve an organization's strategic problems. A practice lens leads scholars to focus on the use of tools for creating common language about strategy and offering spaces for the negotiation of interests. Such uses enable actors to make sense of the world, transform the uncertain into the more certain, and demonstrate their own mastery in strategy making. A practice lens on the selection and application of tools thus offers a more expansive menu of potential outcomes to examine in the strategy making process, from the institutionalization of a tool to its impact on the satisfaction and careers of the users to the ability to move the organization forward in the face of uncertainty.

In this section, we dissect the selection, application and outcomes of tools-in-use, examining how they are shaped by both the affordances of the tools and the agency of the actors. In doing so we develop a series of statements (as numbered in Table 1) about possible relationships that provide the grounds for empirical exploration in future research. While we endeavor for analytical purposes to draw out the directionality of relationships, the influences are recursive, such that actors shape the use of tools for strategy making, and, correspondingly, tools shape the way that actors do strategy making.

Selection

One key question is how and why actors select particular strategy tools to use for specific applications (Arrows 1 and 2 in Figure 1). A rational perspective implies that managers consciously select tools that will be most effective for solving the particular problem that they face. However, the practice lens highlights that there is no one right tool for any situation and

that strategists' choices of tools may be unconscious and routinized in organizational practice (Feldman and Orlikowski, 2011).

Affordances of tools in tool selection (Arrow 1).

March (2006) questions the appropriateness of strategy tools for problem-solving in uncertain environments, and other scholars have expressed concerns about strategy tools being obsolete under changing industry conditions (D'Aveni and Gunther, 1995; Prahalad and Hamel, 1990). Yet existing literature provides little evidence that managers vary their tool use under conditions of change and uncertainty (Grant, 2003; Koufopoulos and Chrysochoidis, 2000). While some minimal industry variation is found in the number of tools used in different industries, it is not correlated with complexity or uncertainty (Frost, 2003; Stenfors *et al* 2007).

Some tools, for example Porter's (1980) Five Forces, get taken up in nearly every core strategic management course in business schools and in the practice of many strategic management consultants (Jarzabkowski *et al.*, 2013; Kachra and Schnietz, 2008; Knott, 2008). Five Forces is thus a tool that is both highly familiar and also has a recognized scholarly pedigree (with some refinements, see Brandenburger and Nalebuff, 1996; and some more substantive disagreements, see Farjoun, 2007; Pfeffer and Sutton, 2006). This familiarity means that the Five Forces tool is accessible and widely embedded within organizational strategy-making processes (Argyres *et al.*, 2002; Clark, 1997; Frost, 2003; Grant, 2003), which may lead actors to select it for tasks for which it was not intended (e.g., company rather than industry analysis).

Similarly, the SWOT (strength, weaknesses, opportunities, threats) framework (Andrews, 1971) is used even more frequently in organizations, though perhaps taught less in business schools today (Ghazinoory *et al.*, 2011). This framework has been assailed as having little intellectual content (Hill and Westbrook, 1997), yet its use is routinized in many organizations.

Scholars posit that managers prefer this tool because it is familiar and easy to use, requiring no training or specific competence to understand and apply it (Frost, 2003). The investment in searching and acquiring the competence to use a different tool may not be worth the effort, when existing tools are ready-to-hand. Rather than their applicability to a task, familiarity may be a key reason for using particular tools that are already embedded in organizational practice and widely recognized by other actors. McCabe and Narayanan's (1991) survey of portfolio planning tools notes that, once institutionalized within firms' planning processes, tools are used persistently, independent of context. We therefore suggest that the selection of tools may be more dependent on standardized organizational use than on the 'fit' of the tool with the situation in the environment (statement 1.1 in Table 1).

Tool selection may also be influenced by the degree to which tools are simple and offer clear visual representations; simpler tools are easier to remember and use (statement 1.2). For example, the BCG matrix is memorable because of its evocative labels of cash cow, dog and star and the two-by-two matrix suggested for sorting businesses into different categories (Armstrong and Brodie, 1994). Similarly, we may speculate that the mnemonic character of Porter's Five Forces, with its alliterative name and its relatively few concepts have aided its uptake (Worren *et al*, 2002).

Given that strategy-making is concerned with profit and loss, forecasting, and financial performance, the 'number-crunching' properties of tools will likely shape their selection (Whittington, 1996: 732). Quantitative tools may be desired in particular contexts. Grant's (2003) study of strategic planning in the oil majors shows that long-term planning required qualitative and scenario-based information, whereas medium-term planning required quantitative information and financial analysis techniques. Quantitative tools may also be attractive because numbers can signal rationality due to their association with accuracy (Denis *et al.*, 2006). On the

other hand, quantitative tools may be harder to use. For example, ‘real options’ is a strategy tool designed for ‘big bet’ industries, such as oil or mining (Bowman and Hurry, 1993). It enables managers to experiment with a range of possible strategic options while retaining the ability to exit at relatively low cost (McGrath, 1997; Miller and Waller, 2003). Yet, one of the criticisms of the real options tool is that its mathematical complexity may have restricted its uptake: managers simply lack the competence to use it (Remer *et al.*, 2001). The selection of quantitative tools is thus attractive to users because numbers can signal rationality, but this attractiveness is offset by potentially greater difficulty in using the tool (statement 1.3).

Agency of actors in tool selection (Arrow 2).

Selection of strategy tools involves interaction between the affordances of the tools and the agency of the actors who use them. One way to understand this interaction is through behavioralist theories (Cyert and March, 1963; Simon, 1947), as we might imagine that managers are satisficers when they select the tools to use. Rather than search for a ‘best’ tool, which, even if hypothetically possible to find, would require considerable time to learn to use (Haspeslagh, 1982; Stenfors *et al.*, 2007), managers tend to use tools already embedded within their organization’s strategy-making processes (McCabe and Narayanan, 1991). The ‘garbage can’ (Cohen *et al.*, 1972) might be a model of how people select strategy tools. That is, given a particular circumstance, they will pick the first tool that they know how to use (or with which they are familiar) that seems to fit the problem at hand (statement 2.1).

This effect may be reinforced by the power dynamics of the organization (Hill and Westbrook, 1997; Hodgkinson *et al.*, 2006). One obvious source of power is that flowing from hierarchy. A recent survey finds that senior managers use more strategy tools than lower level managers (Jarzabkowski *et al.*, 2013). The support of the CEO also plays a crucial part in the adoption of strategy tools (Stenfors *et al.*, 2007). For example, Haspeslagh (1982) shows that

higher CEO commitment was associated with successful adoption of portfolio planning tools. Even where other managers initiated use of the tool, signals from the CEO such as investing time and personal engagement aided adoption. Thus, actors have more or less freedom to select a tool depending on their position in the hierarchy (statement 2.2).

Expertise is another source of power (French and Raven, 1968) that shapes the selection of strategy tools. Managers may select a tool because it allows them to demonstrate their educational status and competence. Studies show that receiving an MBA enables actors to feel competent in proposing and using tools (Jarratt and Stiles, 2010), and managers with higher postgraduate and executive training use a greater number of strategy tools (Jarzabkowski *et al.*, 2013). Furthermore, MBA-educated managers jealously guard their competence from colleagues that have not had MBA training, using their education to further their own careers, rather than sharing knowledge about tools with their teams (Legge *et al.*, 2007). Thus, actors have more or less freedom to select a tool depending on their competence in its use (statement 2.3).

Application

When seen through a practice lens, the application of tools is situated within specific social contexts and shaped by both the affordances of the tools and the actors who apply them (Arrows 3 and 4, Figure 1). Studies suggesting that using the ‘wrong’ tools (Ghoshal and Moran, 1996) or using tools in the ‘wrong’ way (Lozeau *et al.*, 2002) is bad for management practice promote a false dichotomy between correct and incorrect use that obscures the many improvisations that occur as tools are used in practice (Orlikowski, 1996; Whittington, 2006; Worren *et al.*, 2002). While the designers of strategy tools may intend certain applications, this does not guarantee that tools will be used as intended. A survey of Fortune 1000 companies shows that strategy tools

such as PIMS¹ and BCG ‘star/dog’ models have increasingly been applied in theoretically unanticipated ways, as managers become familiar with their principles and adapt them to include new dimensions (e.g., stockholder value) (McCabe and Narayanan, 1991). Haspeslagh (1982:65) shows that portfolio planning tools are more useful where managers remove the ‘theoretical mask’ of their intended use for corporate level portfolio planning and apply the tools at multiple levels, including within strategic business units. As an executive in a survey of tool use in Finnish companies responded, ‘[The methods behind the tools] are not important in practice if the work gets done’ (Stenfors *et al.*, 2007: 933).

Affordances of strategy tools in their application (Arrow 3).

Because tools have interpretive flexibility, users can adapt them according to their interpretations and interests. Haspeslagh (1982) found that when managers in multinationals stuck too rigorously to the theoretical bases of a portfolio planning tool, they generated hundreds of items to plot in their corporate portfolio, an exercise that many ultimately found unhelpful. More usefully, portfolio-planning tools enabled managers to think about the various missions of their strategic business units. The more experienced managers were in using portfolio-planning tools, the more successful they were in adapting them to their various needs. These adaptations violated the intended use of the tools and could therefore be seen as incorrect and potentially error prone. One might imagine that this would lead managers to discard tools. Yet, McCabe and Narayanan (1991) find that the use of strategy tools, even as they are adapted sometimes beyond recognition, persists in organizations. The practice lens suggests that such tools persist because they afford a variety of useful organizational functions.

Strategy making often requires people from different parts of the organization (different divisions, different functions) to work together. Because these people will likely come from

¹ PIMS stands for ‘profit impact of marketing strategy’ and is a tool used to identify key performance criteria in organizations (Buzzell *et al.*, 1975)

different ‘thought worlds’ (Dougherty, 1992), they must find a means for overcoming interpretive barriers. Various studies have shown the importance of fostering strategic conversations across multiple managerial levels, functions and divisions as part of generating buy-in to strategy (Floyd and Lane, 2000; Jarzabkowski and Balogun, 2009; Mantere and Vaara, 2008). A critical feature of this process is generating a common language across these boundaries. Research on boundary-spanning work in other domains (such as new product development) has shown that artifacts can serve important roles in bridging divides and creating shared reference points. These artifacts can be characterized as ‘boundary objects,’ in that they mediate relations between diverse groups to enable problem solving across boundaries (Bechky, 2003; Carlile, 2002; Levina and Vaast, 2005; Star and Griesemer, 1989). Building on these ideas, some scholars have proposed that strategy tools might play a similar role (Spee and Jarzabkowski, 2009; Stenfors *et al.*, 2007), providing a common language for strategic conversations between managers across hierarchical, functional and geographic boundaries (statement 3.1).

Strategy tools can also create spaces for social interactions that allow actors to negotiate their different interests (statement 3.2). That is, strategy making is both an interpretive and a political process (Kaplan, 2008). Differences across boundaries demand not just shared language but also resolution of the tensions arising because different groups of actors have different things at stake (Carlile, 2002). Chesley and Wenger’s (1999) study of the Balanced Scorecard finds that the tool created a space for managers to negotiate their anxieties and political interests about the introduction of new performance measures by enabling them to revisit and revise the dimensions of the tool. Providing sites for social interaction and participation in strategy making across organizational levels can have positive effects on performance, even where consensus is not an outcome (Wooldridge and Floyd, 1990). Further, tools may also be used to realign resources and

sources of power in the organization. Tools are powerful to the extent that they map on to (or can be adapted to) the existing interests of the dominant actors in an organization (Denis *et al.*, 2006) or if they are useful in realigning those interests and views.

Carlile (2004) points out that, where differences between groups are known, the boundary objects used to negotiate these differences can be relatively stable. However, with increasing complexity and uncertainty – the kind that March (2006) highlights as problematic – negotiations across boundaries involves transforming knowledge, typically by changing the meaning of the objects used by participants. As managers appropriate the tools, they change them. But the possible scope of these improvisations is not infinite. As Pentland and Feldman (2008: 243) remark: ‘A personal computer can be translated as a plant stand...[but] no amount of translation will turn a toaster into a cell phone.’ A feature of strategy tools is that they embed particular content and are often presented using visual frameworks. Hence, while strategy tools can be adapted, their affordances also bracket what may and may not be discussed. For example, when managers use a BCG matrix, they will be inclined to see some strategic activities as stars and others as cash cows (Armstrong and Brodie, 1994), so that strategic focus is oriented towards the categories available within the tool. Therefore, the content and structure of the tool channel potential improvisations as the tool is used (statement 3.3).

Agency of actors in the application of strategy tools (Arrow 4).

Given these affordances, how do managers mobilize strategy tools? Again, we can refer to interpretive and political dimensions, where actors can use tools to make sense of uncertain environments, advocate particular points of view, and legitimate certain courses of action. Strategy is inherently a social process, where a good deal of strategy making takes place in meetings and workshops (Hendry and Seidl, 2003; Hodgkinson *et al.*, 2006; Johnson *et al.*, 2010) and implementation depends on broad swaths of the organization (Balogun and Johnson,

2004). Strategy tools are one important means by which managers navigate these social dynamics while at the same time working to develop strategic insights.

Research on strategy practices has suggested that it involves both sensemaking and ‘sensegiving’ (Balogun and Johnson, 2004; Gioia and Chittipeddi, 1991). Top managers must sort out the ambiguous signals from the environment and then convey their insights to others; and they can use strategy tools in both of these functions. As Grant (2003) demonstrates, some executives in oil majors used strategic planning templates and tools to support communication and coordination between corporate and divisional managers. Similarly, middle managers responsible for implementing strategy can use tools to convey the deliverables expected during critical phases, such as mergers (Whittington *et al.*, 2006), or communicating key concerns to senior managers during strategic change (Jarzabkowski and Balogun, 2009). Thus, actors use tools as interpretive devices that enable them to focus attention on and make sense of strategic issues for themselves and for others (statement 4.1).

Some studies characterize any use of tools to justify positions taken for ‘non-rational’ reasons as incorrect or bad for practice (Ghoshal and Moran, 1996; Hamel and Prahalad, 1994). Yet, research on strategy making shows that, in practice, actors find it useful to marshal tools to legitimate particular positions or viewpoints (statement 4.2). Tools can be mobilized in political processes by actors who are looking for ways to contain or influence strategic debate (Hodgkinson and Wright, 2002). Related studies on strategic planning and accounting echo these insights. Vaara, Sorsa and Palli’s (2010) study of the City of Lahti (Finland) finds that actors imbued strategic planning texts with ‘textual agency’ that enabled shifts in power relations in the organization. These shifts in power forced consensus and legitimized certain courses of action. Denis *et al.*’s (2006) study of health care boards shows that by mapping quantitative metrics onto dominant values in the organization, actors made a controversial decision palatable to others.

The numbers filled ‘the strategic void created by pluralism’ (p. 350) and conveyed ‘consistency, transparency and competence’ (p. 362) that disempowered adversaries. Similarly, studies of auditing and accounting (Nahapiet, 1988; Pentland, 1993) show how accounting rubrics get used to transform the uncertain into the certain by categorizing and quantifying data. That is, using a strategy tool to justify a position does not *get in the way of* the use of the tool, it *is* a use of the tool (Weick, 1998).

As people engage in these negotiations, they work with the tools. And, as actors work with tools, they adapt them to fit the needs at hand (statement 4.3). As Orlikowski (1992) finds in her analysis of one organization’s implementation of computer-aided software engineering (CASE) tools, users modify the functionality of the tools in order to make them more useful in daily practice. Such improvisatory uses of tools are responses to real life situations. By adapting tools to their particular purposes, actors are able to negotiate their way through the specific demands of their context. For example, Haspeslagh (1982) finds that experienced managers adapted portfolio analysis tools and techniques from the corporate level for which they were intended to the business unit level, which they did not see as a deviation but rather as a practical way to make better use of the tool for strategy making. By implication, increased complexity or uncertainty does not necessarily lead to more ‘mistakes’ in the use of tools, as March (2006) would suggest, but rather to adaptive behavior to make tools useful.

Outcomes

When considering outcomes, a functionalist view of tools prevails in the literature. This view assumes that, ‘correctly’ used, tools can achieve the ‘right’ outcome. Failure to achieve such an outcome indicates an inadequacy of the tool or the user (Lozeau *et al.*, 2002). March’s (2006: 208) main concern in his critique of strategy tools is the risk that such ‘technologies of rationality’ would produce ‘disasters’ when trusted to find solutions in inappropriate situations.

Yet, he is not trying simply to prevent these disasters. He is trying to balance the potential for tools to be used to identify new possibilities in more complex situations with the risk that this exploration might lead to ‘costly, even deadly’ errors. His dilemma begins to open up the possibility for alternative criteria against which to evaluate the use of tools. We use a practice lens to build on this idea, suggesting that an assessment of outcomes can be extended to consider not only whether a ‘successful’ strategic outcome for the organization was attained but also whether the tool-in-use produced a range of other organizational or individual outcomes for the actors and tools themselves.

The strategy-as-practice research agenda has called for consideration of a wider range of outcomes beyond firm performance (Johnson *et al.*, 2007; Whittington, 2006). Yet, research has not yet fulfilled this agenda, having privileged detailed explanations of the practices of making strategy as a first stage in the development of the field (Jarzabkowski and Kaplan, 2010). Studies of outcomes associated with strategy tools are rare, with the exception of Armstrong and Brodie’s (1994) lab experiment showing how using the BCG matrix shaped participants’ evaluation of a decision task.

Outcomes associated with strategy tools (Arrow 5).

Why is it that certain tools become widely used and others not? This field-level question in tool use is a less-explored aspect of the strategy-as-practice agenda (Jarzabkowski, 2004; Whittington, 2006). It calls attention to the huge industry of individuals and organizations making and selling strategy tools (academics, business executives and consultants). Institutional theory could provide one set of approaches for future analysis. It offers theories about the mechanisms of institutionalization and isomorphism (DiMaggio and Powell, 1983) that point us to consider the degree to which a tool becomes routinized in organizational practice or institutionalized in the field as a salient outcome.

Some strategy tools get routinized into organizational and educational life. As highlighted above, Porter's (1980) Five Forces, the SWOT framework and many other tools are well-known and frequently used. On the flip side, the list of tools that have been developed and proposed by consultants or academics yet never get widely adopted is too long to enumerate. Some tools, such as the BCG 'star'/'dog' matrix, now persist at a moderate level of use after a prior peak in popularity (McCabe and Narayanan, 1991). Thus, the 'success' of the use of a strategy tool can be examined at the organizational and field levels, where success is associated with adoption and routinization in organizational practice (statement 5.1), diffusion and wide adoption in management education (statement 5.2) and diffusion and wide adoption by managers in organizations (statement 5.3).

We might find a starting point for assessing these statements in Zbaracki's (1998) analysis of the rhetoric and reality of total quality management (TQM) implementation. In this study, he digs into the details of how managers constructed their TQM programs to conform to rhetorics of success that then fueled the processes of institutionalization. In related work from science studies, Owen-Smith (2005) looks at how university technology licensing officers structured their work around the dockets that contain all of the background information about the invention. He documents that, in rationalizing their actions through ongoing organizational learning, these officers stabilized and institutionalized particular work procedures and language associated with building and maintaining dockets. Research on practices in management education (Kipping *et al.*, 2004) and management consulting (Kipping, 1999a) offers another starting point for analysis of the institutionalization of some tools and not others. For example, evidence that management education is associated with greater use of strategy tools (Jarzabkowski *et al.*, 2013) suggests that management education and, by corollary business schools, are a key institutionalization mechanism for strategy tools.

Outcomes associated with actors in organizations (Arrow 6).

A standard approach to assessing tools is to evaluate whether the use of the tool led to an accurate analysis and a successful strategy. The problem with these criteria is that such outcomes are often only known in the long term and are difficult to ascribe to the use of the tool itself. The case of Shell Oil's famous anticipation of the 1970's oil embargo has been used to justify the power of scenario tools (Schwartz, 1991). Merck's use of real options to manage its R&D portfolio has been equally lauded (Nichols and Lewent, 1994). But, these examples are few and far between, and, in the case of Merck, scholars have called into question the attribution of the company's success to the tool (Bowman and Moskowitz, 2001). From the standpoint of actors in organizations, there are many more proximate measures of the usefulness of strategy tools.

March (2006: 209) suggests that we should be concerned with how a tool is mobilized for exploratory search. The tension of most concern to him was whether such explorations – provoked by the (mis-)use of tools, or their use in settings for which they are not suited – might be worth the risk:

‘Technologies of rational choice...are not simple instruments of exploitation but (partly) instruments of exploration hiding behind a façade of exploitation: revolutionaries in pin-stripe suits. As such, they should perhaps be seen less as stodgy agents of conventional knowledge than as dangerous fools, joining thereby the pool of dreams out of which come great ideas as well as monstrous and idiotic ones.’

Whether a strategy is ultimately ‘great’ or ‘idiotic’ may only be known well into the future. As a more immediate outcome, we can assess the degree to which the improvisational use of the tool provoked exploration (statement 6.1).

Using tools can also produce consensus or at least provisional settlements (Kaplan and Orlikowski, 2013) that can be the basis of a strategic choice. Research has pointed out that not all strategy making efforts lead to decisions (Bachrach and Baratz, 1963; Pettigrew, 1977).

Decisions may be deferred either by choice or by the inability to reach a conclusion (Kaplan,

2008). The degree to which the use of a tool enables interim decisions that allow a project or organization to move forward may be an outcome in and of itself (statement 6.2).

Another measure of success in the use of a tool is the degree to which the ‘client’ of the particular strategy project in which a tool is used is satisfied with the outcome of the project (statement 6.3). Inside an organization, a team may engage in strategic analysis for an executive who is the client for that project. The literature on team performance (e.g., Wageman *et al.*, 2005) suggests that the satisfaction of a team’s client is a centrally important outcome. In the case of management consultants, the paying client has commissioned the study and may be more or less content with the services provided (Czarniawska and Mazza, 2003; Kipping, 1999a; McKenna, 2006). Such client satisfaction, while it may be difficult to assign solely to the use of the tool, is thus a relevant outcome.

The strategy-as-practice field has focused attention on the actors who make strategy (Whittington, 2006), pointing out that actors pursue their own interests – either in supporting one view over another (Balogun and Johnson, 2004; Kaplan, 2008; Sonenshein, 2010) or in achieving career objectives (Mantere and Vaara, 2008) – as much as those of the organizations to which they belong. Yet, little is known about how the use of strategy tools connects to these objectives. Some studies suggest that managers may use tools to demonstrate their educational skill base (Jarratt and Stiles, 2010; Jarzabkowski *et al.*, 2013) and generate status and career outcomes (Baruch and Peiperl, 2000; Jarratt and Stiles, 2010; Legge *et al.*, 2007) by being more competent in the use of the tool than their peers. The ability to speak the language of strategy through skilled use of strategy concepts is critical for participating in and influencing strategy-making activities (Astley and Zammuto, 1992; Barry and Elmes, 1997). The very concept of competence in strategy making is embedded within a normative strategy discourse in which the use of such tools constitutes an actor’s identity and subjectivity as a strategist (Knights and

Morgan, 1991). The reverse is also true. Chesley and Wenger's (1999) study of the implementation of the Balanced Scorecard shows that, by providing a systematic means to assess individual performance, it created career anxieties for those feeling less competent. Given that actors have different degrees of competence in using strategy tools, using such tools could provoke similar career anxieties (if a person was unable to master the tool) or contribute to a person's advancement (if he or she were seen to be a proficient user of the tool). Thus, the success of a tool may be assessed by the degree to which its use helps an actor demonstrate competence (statement 6.4).

Relatedly, the use of a tool can also constrain or enable discretion of individual actors. Hodgkinson *et al* (2006) finds that most of the organizations they surveyed used strategy workshops (an enabling technology if not precisely a strategy tool under our definition) to exclude middle managers, thus reinforcing the power of elites. Hodgkinson and Wright's (2002) examination of scenarios concludes that their use provoked intense concerns about the personal impact of potentially negative futures. As a result, members of the senior management team engaged in a variety of coping mechanisms that led to the 'failure' of the process. This failure was actually a 'success' for those actors who would have been disadvantaged by the proposed strategy. In this case, using a tool will be considered a success to the extent that actors are able to achieve their personal objectives such as the legitimacy of their own roles or the ratification of a preferred strategy (statement 6.5).

These kinds of power dynamics and interpersonal tradeoffs imply that the use of a tool can involve different degrees of contestation about interests or ideas and may lead to different degrees of shared understanding about the strategic problem and its potential solution. The development of strategy repeatedly has been shown to be political, requiring negotiation across various actors with different interests and frames of reference (Eisenhardt and Bourgeois, 1988;

Kaplan, 2008; Pettigrew, 1977). Strategy tools are likely to be enlisted in this process of surfacing and resolving differences across actors (statement 6.6). For example, Kaplan (2011) shows that actors mobilized PowerPoint technology to carve up strategic territory, excluding some actors and ideas and including others.

It is important to note that scholarship on the outcomes of strategy tools-in-use is largely absent. A first step to building research in this area is recognizing the multiplicity of possible outcomes for both tools and the actors who use them. The framework we develop leads researchers to problematize the notion of ‘successful’ or ‘correct’ use of tools, as success in one dimension or for one actor may be failure on another dimension or for another actor.

ILLUSTRATING A FRAMEWORK FOR STRATEGY TOOLS-IN-USE

To illustrate some of the dynamics in Figure 1, we offer a vignette of a tool-in-use drawn from fieldwork studying the strategy-making processes at a multinational telecommunications equipment company (‘CommCorp’) facing a significant industry crisis.² Because the exploration of strategy tools-in-use was not the focus of the data collection, we use it as only as a way to give life to a few of the statements in Table 1.

This vignette involves the introduction at CommCorp of a standard tool in strategic management, the ‘aggregate project plan’ originally proposed by Wheelwright and Clark (1992). This tool is a matrix intended as a means to assess the balance of innovation efforts in an organization’s project portfolio by plotting projects on two dimensions according to the extent of product and process change required. CommCorp was going through radical changes in the environment that required a new strategic approach (this was a communications technology company during the bursting of the Internet bubble in 2001-2002). The head of technology strategy (‘Brad’) announced he would bring together his team to discuss a realignment of their

² These data come from a wider study of strategy making in CommCorp as reported in other publications, including Kaplan (2008), Kaplan (2011) and Kaplan and Orlikowski (2013). The names of the company and individual managers are disguised. We were equally inspired by Jarzabkowski’s fieldwork (e.g., Jarzabkowski 2008).

strategy. The challenge was complex, both strategically in terms of the issues and socially in binding together the team that would have to work on them:

We are going to create a team of people that are going to look at the business dimensions, at what the return is. We are going to have marketing people and economists and business planners... We would not want to make a technology decision that did not have some well-founded reason and rationale.

Managers were searching for tools that might facilitate analysis and decisions in this context. The aggregate project plan tool had already been introduced to CommCorp through an executive education course at a top business school. The tool became known within the organization as 'bubble charts' because it involved using 'bubbles' to locate projects on the two-by-two matrix. 'Chris,' a team member who had recently been promoted to senior management and wanted to demonstrate his abilities, proposed that he would use the bubble charts to analyze the portfolio. Some felt that this tool would be useful in providing a rational basis for making decisions: 'Some kind of quantitative effort to say what kind of measures you would apply to this, from very bad to very good. At least if you apply that consistently across your analysis then you actually have something which you can measure.' Thus Chris *selected* the tool because of his expertise in its use (2.3) and also because the tool was seen as a way to provide a rational basis for decisions (1.3). But this choice was also guided by anticipation that its use would give legitimacy to certain technology strategy decisions and anticipation of certain outcomes, especially Chris' personal objective to advance his own career.

In *applying* the tool, Chris immediately changed the original (product and process change) dimensions of the matrix to depict two new dimensions – product reach and market reach. He felt these externally-oriented dimensions would be more useful in analyzing the CommCorp project portfolio during the period of crisis. The emphasis on the market was essential during the economic crisis because no strategy could go forward without a market justification (a change for this organization which had previously been very technology focused).

Thus, he appropriated the existing matrix structure (4.3) and adapted it for his local context. Subsequently, during a senior management meeting, executives hotly debated the dimensions and proposed many other alternatives, including technology reach, risk and return, and size of investment. Managers supported different ideas for a variety of reasons: some because particular axes would favor preferred projects, some because of particular views about the external environment, some because of concerns about internal politics. As one executive noted, ‘There are different views about the definitions of the axes and the ranking of projects, and these need to be clarified and aligned as a group.’ The tool became a vehicle for surfacing and contesting various actors’ interests (3.2). Said one manager, ‘It is very clear that [one executive] would rank the projects very differently than [another executive]. Guaranteed.’ Over the course of the discussion, it became apparent that Brad had preferred outcomes in mind, as he attempted to use the indicators in the bubble charts to convince the others that they did not have enough ‘Hail Mary’ (radical innovation) projects.

Because of these differences, the discussion was tabled until further work could be done. The managers did not make a decision about the final portrayal of the portfolio (6.2). In this sense, the use of the tool ‘failed.’ But the team came away from the discussion collectively focused on the need to evaluate projects in terms of risk and reward over both the short term and the long term and a clearer understanding of where each person in the organization stood on different issues. Hence, the use of the ‘bubble charts’ led to several strategic *outcomes* but not because the tool was used ‘correctly.’ The use of the tool led CommCorp managers to consider new sources of data (6.1), debate a range of issues (6.6) and discuss what achieving a ‘Hail Mary’ might look like (6.5). These explorations might not have been productive in reaching an immediate decision, but they did break down existing frames about the situation and opened up the organization to potential new avenues for growth.

RECURSIVE DYNAMICS BETWEEN SELECTION, APPLICATION AND OUTCOMES

This vignette has illustrated how some aspects of our model in Figure 1 might operate in practice. As it shows, no single rationale is responsible for tool selection, multiple features guide application, and various outcomes are achieved as tools are used. Further, if we turn to Arrows A, B and C in Figure 1, we argue that the selection, application and outcomes of tool-in-use are intertwined. Each arrow is double-headed, indicating that the influences move in both directions and are mutually interdependent. To date, there is little theoretical or empirical understanding about how these relationships work. In Table 2, we offer an initial set of guiding statements that we intend to provoke future research into the types of effects that should be of interest. To do so, we draw on and integrate various streams of research in strategic management, tracing out their implications for tools-in-use.

-- Insert Table 2 about here --

Starting with Arrow A – the relationship between selection and application – we can make the superficially obvious point that the application of a tool in strategy making is shaped by which tool is selected (statement A1). Each tool has its own affordances and these will constrain and enable its use. Reciprocally, tool selection may be shaped at least partially by anticipation of a particular application (A2). This could be seen through the rationalist view undergirding positioning theories of competitive strategy (Ghemawat, 1999; Porter, 1980): certain analytical problems require specific tools to analyze them. Political theories of strategy making (Eisenhardt and Bourgeois, 1988; Pettigrew, 1977) enrich this view by highlighting that actors will select tools precisely because their particular affordances are more easily applied to some problems than others and likely to favor some kinds of solutions over others. Indeed, the subtlety of this relationship between selection and application may be inferred from the ‘garbage can’ model of decision making (Cohen *et al.*, 1972); that tools may be known solutions looking for problems to

which they can be applied (A3).

Turning to Arrow B – the relationship between application and outcomes – our processual view implies that the use of tools evolves: as tools are applied, actors' goals and the outcomes they are able to achieve can shift (B1). This view is grounded in the body of research on emergent strategy (Eisenhardt, 1989; Mintzberg and Waters, 1985) in which the strategic outcomes realized by an organization arise from an evolving stream of actions. Further, as goals shift, the applications of the tools may have to be adapted (B2). On the other hand, as political models suggest (Pettigrew 1977), actors may also instrumentally adapt the application of a tool based on anticipated or desired outcomes (B3).

Finally, in Arrow C – the relationship between outcomes and selection – we highlight the effects of tool use over time. Learning theories posit success as an important activator of 'learning by doing' (Eggers and Kaplan, 2013; Greve, 2003; Levitt and March, 1988), where prior organizational performance determines whether organizations search for new solutions or reinforce old ones. Thus when the application of particular tools has enabled actors to achieve at least some of their desired outcomes, such tools are likely to be selected for future strategy-making processes (C1). Reciprocally, tool selection is shaped at least partially by anticipation of, or desire for, a particular outcome (C2). This relationship between tools and outcomes could become routinized and self-reinforcing such that it could be a source of inertia in the face of change in organizational circumstances (C3). That is, a core competence in the use of a tool (reinforced by success) could become a 'core rigidity' (Leonard-Barton, 1992) or source of organizational 'myopia' (Levinthal and March, 1993) when the tool continues to be selected under conditions for which it is no longer appropriate.

By paying attention to the recursive relationships between tools and actors through the interlinked processes of selection, application and achieving outcomes, scholars can advance

understanding in the strategic management field about how the tools we develop and teach can shape individual, organizational and field-level outcomes.

DISCUSSION: A RESEARCH AGENDA FOR STRATEGY TOOLS-IN-USE

By viewing strategy tools as tools-in-use, we can understand that tools do not cause managers to make right or wrong decisions but rather enable them to engage in strategy making. Actors use tools for many reasons, in many ways, and in accomplishing a wide variety of outcomes. Hence, when strategy tools are thought of primarily as technologies of rationality, knowledge of the rich and complex ways in which actors learn, explore, improvise and thus make strategy with tools is limited. The main contribution of this paper is to develop a framework, Figure 1, which shifts the conversation about strategy tools away from characterizations of ‘good’ or ‘poor’ use and towards an understanding of how tools are used and are more or less useful. The accompanying statements in Tables 1 and 2 provide resources to guide empirical research on strategy tools-in-use. These statements are not exhaustive, but rather represent a crystallization of what is known or what can be inferred from current research. Our goal is to promote further research on these topics.

Implications for research on strategy making

One implication for research is that the contrast between the ‘rationality’ of economic man with the ‘irrationality’ of use is not analytically useful. March (2006) argues that deviations from procedural rationality can be regarded as potentially problematic for the firm. A practice lens suggests instead that, in their political and interpretive practices, actors seek rationality and make attempts to convey rationality as they make strategy (Cabantous and Gond, 2011). As Meyer and Rowan (1977) pointed out, rationality is a social convention prescribing a certain set of values that actors should hold. Thus, being or appearing to be rational is an ‘effortful accomplishment’ (Lounsbury, 2008: 353). Strategy tools are implicated in the ways that actors engage in these

efforts to produce rational accounts of their strategy making. The more that tools become part of the organizational routines of strategy making, the more they come to symbolize these intendedly rational strategic processes. The framework presented here allows us to reconcile views of strategy tools as ‘technologies of rationality’ and as ‘tools-in-use.’ In particular, mapping the recursive loops between selection, application and outcomes provides an integrated understanding of how people mobilize tools to enact a rational ideal, and in doing so achieve a wide variety of outcomes for themselves and the organizations in which they operate.

A second implication for research is that a practice lens on strategy tools directs attention away from a sole focus on whether or not the strategy makers ‘got it right’ in terms of firm performance. Instead, it points us towards outcomes related to the processes of strategy making – such as settlement on a decision, satisfaction with the outcome, contestation in the process, discretion of the actor – which may be critical indicators of success for the actors who use tools, or to the institutionalization of the tool within the organization or the field. With this broader range of outcomes to assess, scholars may be less prone to judge the use of a tool as poor and more likely to examine how and why actors use tools and how the use of a tool constrains and enables strategy making.

Where positioning theories of strategy have assumed that strategy is a largely analytical and relatively tractable task (e.g., Ghemawat, 1999; Porter, 1980), our model of strategy tools-in-use suggests that these intendedly rational activities are implicated in political and interpretive processes. These processes are not deviations from use but rather are motivated by participants’ different viewpoints and goals, enabling them to cope with uncertainties. The introduction of strategy tools does not remove the politics or emotions of strategy making. Instead tools can be coopted and adapted to match the circumstances. To political theories of strategy making (e.g., Eisenhardt and Bourgeois, 1988; Pettigrew, 1977), our framework offers tool-in-use as another

arena in which to examine how political processes play out. Further, it emphasizes that even highly politicized processes of strategy making are also shaped by the intended rationality of the participants choosing and using the tools.

Extensions of the framework of strategy tools-in-use

There are at least three natural extensions of our framework of strategy tools-in use that could be explored in future research: examining the different implications for the creation of new tools, for different types of tools, and for different types of actors.

Our focus has been on those strategy tools either developed from management theory and/ or taught in business schools in order to encourage us as strategy academics to reflect more upon our role in the practice of strategy tools-in-use. However, as managers may also create new tools for their own purposes, a natural extension of our analysis would be to focus on the *de novo* development of strategy tools. Why would a manager develop a new tool when there are so many already available? Drawing from our framework, such research might find that actors make new tools in order to provide quantifications of contentious issues. Actors may create tools to demonstrate a particular level of competence or to have influence over subsequent strategy discussions and outcomes, as others will be less versed in the tool. Building from this, we may also query, how are newly developed tools incorporated into organizational practice? Do the selection, application and outcomes of *de novo* tools mimic the adaptation and re-purposing of existing tools, as outlined in our framework, or do new analytical categories emerge? These subjects are open terrain for future scholars.

The variation in existing types of strategy tools also merits exploration. Some (such as real options tools) are quantitative and embedded in spreadsheets or other software. Others are more easily captured with simple visual representations (e.g., the aggregate project plan or BCG's star/dog framework). These features are affordances that will surely constrain and enable

different types of actions. For example, a tool that requires detailed quantitative analysis may not be chosen because actors do not feel competent to use it. Alternatively, the quantitative metrics in a spreadsheet may be easier to manipulate in order to support a desired strategic choice. A visual tool may be easier to adapt to the specific needs of the organization, much as we saw the participants at CommCorp adapt the ‘bubble charts.’ Scholars have the opportunity to attend to the different affordances of different types of tools.

Finally, it should be clear from our analysis that not all actors are the same. Most work on strategy tools to date has had a distinctively senior management focus (Frost, 2003; Stenfors *et al.*, 2007), although scholars have readily pointed out that middle managers play a central role in strategy making (Balogun and Johnson, 2004; Burgelman, 1994). In addition, strategy officers within organizations and external consultants are regularly involved in making strategy. It seems natural that these different actors might choose different tools and use them differently because of their diverse sources of power, varied levels of expertise, and the wide range of outcomes at stake. How might the dynamics portrayed in our model of strategy tools-in-use change if we were to focus on any one of these different communities of actors or on the interactions between them?

Methodological approaches to studying strategy tools-in-use

To pursue these research avenues, we need an expanded portfolio of methods. Our view of strategy tools-in-use opens up different levels and units of analysis for research. That is, strategy scholars should not only focus on the firm as a monolithic whole, but also consider analyses of individuals (their interests, career aspirations, skillful demonstration of competence), teams or groups (their efforts to work together, their learning, their resolution of differences), projects (who is involved, how the problem is defined, how progress occurs, whether decisions are reached), the tools (their characteristics, the degree to which they are adopted and

institutionalized) and the field (the institutionalized practices, the professions and professionals who develop and sell tools).

To achieve this breadth of research on strategy tools, scholars will want to employ multiple methods. Current work is dominated by observational field studies (e.g., Jarzabkowski, 2008; Kaplan and Orlikowski, 2013; Rouleau, 2005; Samra-Fredericks, 2003). This approach will remain an essential source of insight for studying tools-in-use. If we want to understand strategy tools, there is little substitute for spending time in the field watching organizational members use them. The challenge for this kind of work, however, is that it is often difficult to track tools – especially if they are subject to many handoffs, potentially across many locations – or to identify in advance the type of interactions with tools that should comprise the unit of study (Bechky, 2008). The actual use of tools is emergent, requiring the researcher to be in the right context at the right time to observe what unfolds.

Surveys and interviews are useful supplements. Elsbach's (2004) study of workplace identity is one model. She conducted surveys about objects that signaled identity and then followed up with interviews to understand when such objects mattered most. Bechky (2008) brought particular artifacts to interviews and asked interviewees to explain how and when they used the artifacts. Balogun *et al* (2003) suggest that interview protocols might be extended to discussion groups and self-reports, methods that are not yet well-established in strategic management. Surveys would also be helpful in contexts where ethnographic work is not feasible, such as in complex, multi-divisional or multinational organizations.

Recently, scholars have noted that visual evidence of artifacts as they are used and as they change over time (i.e., photographs of artifacts, such as design blueprints and prototypes) is a rich source of data (Bechky, 2008; Meyer *et al.*, 2013). With a few exceptions (e.g., Dougherty and Kunda, 1992; Ewenstein and Whyte, 2009; Kaplan, 2011), scholars have had challenges in

introducing such visual evidence into journal articles because visual research methods are not yet established in management (Ray and Smith, 2012). Nonetheless, we argue that visual analysis will be a crucial aspect of future research on strategy tools. For example, if we return to the CommCorp vignette, photos of the changing labels attributed to the axes of the ‘bubble charts’ over successive meetings could provide evidence of how tools-in-use are mobilized in contestations of meaning.

Following Armstrong and Brodie’s (1994) early lead, we also expect that experiments could offer insights into strategy tools. By manipulating either the content or structure of the tool or the circumstances of analysis and negotiation, research might be able to understand at a micro-level how tools shape group interactions. This could provide a point of contact with behavioral approaches to strategy (see Gavetti *et al.*, 2012, for a recent summary) and the emerging stream of work on the micro-foundations of strategy (Abell *et al.*, 2008), allowing these researchers to incorporate material circumstances, such as the use of strategy tools, into their analyses.

If we are to look at the institutionalization of strategy tools at the field level, then historical methods such as those used to analyze management consulting and other management practices will be called for (Kipping, 1996, 1999b; McKenna, 2006) as well as the related tools used by institutional theorists (e.g., Lounsbury, 2003; Schneiberg and Soule, 2005; Zietsma and Lawrence, 2010). One useful handhold is Ansari *et al.*’s (2010) framework for studying practice variation that links organizational mechanisms of implementation with field-level mechanisms of diffusion. Furthermore, the study of tools may span levels of analysis, as scholars examine the recursive elements of tool use, from actors’ selection of a widely institutionalized tool, to their modification of it and the spread of such modifications within and outside the organization (for example, Zbaracki, 1998).

As a further extension, scholars can also examine tools as cultural artifacts that reflect

social reality (Hatch, 1993; Schein, 1990). By studying one tool, in the way that cultural scholars have examined artifacts such as doctors' lab coats (Fiol and O'Connor, 2005), we can explore the social identities of the users or the producers of tools. A field-level mapping of the evolution of strategy tools over time would give insight into how strategic management is conceived as an activity and a profession. By exploring how tools are constructed and used over time in a field, as Kaghan and Lounsbury (2005) have done for technology transfer contracts in the technology licensing field, we can gain a perspective on how institutional understandings are embedded in tools.

Thus, a framework of strategy tools-in-use provokes scholars to examine a greater variety of units of analysis using a broader range of methods than is typical in the core strategic management field or in the strategy-as-practice community. Doing so will generate a more dynamic and nuanced understanding of how strategy tools enable and constrain strategy making.

Implications for managers and for our practice as teachers of strategy

In the past decade, there has been much debate about the usefulness of management education and more or less explicitly about management tools (Baldrige *et al.*, 2004; Farjoun, 2007; Ferraro *et al.*, 2005; Markides, 2011; Mintzberg, 2004; Pfeffer and Sutton, 2006; Shepherd *et al.*, 2004; Vermeulen, 2005). These concerns are threefold: that managers might not use the tools we teach them; that if they do, they may misuse them; and that they might use the wrong tools. An analysis of strategy tools-in-use should inform this discussion by allowing us to understand which tools are used, why 'misuse' (meaning use outside the textbook description) may not be 'wrong,' and what outcomes managers actually seek from tools. This perspective refocuses our attention as strategy teachers on ensuring that managers are better equipped to use tools for the purposes that are of value to them.

Our framework provides insight into the actual (and often unintended) practices of using

strategy tools. For managers, tools should not be perceived as neutral objects that can eliminate politics from strategy making, but rather as one means for surfacing assumptions, asking tough questions and aligning interests within the organization. Using a tool is undoubtedly helpful in enabling managers to convey rationality in contexts that privilege the idea of rationality. However, a framework of tools-in-use highlights the ways that managers continuously devise and revise strategy, testing and modifying it within the context of their actions and interactions. Said differently, strategy is not something an organization *has* but rather something that people in organizations *do* (Whittington, 2006). Tools are most usefully seen as parts of the process rather than purely as sources of the ‘answer.’

Those of us who teach strategy or develop strategic tools or frameworks, typically conceive of our task in the ‘instrumental mode’ (Astley and Zammuto, 1992: 453) of contributing tools and techniques to managers. Yet, many of us have long suspected that tools do not operate as they are ostensibly designed to do. In viewing strategy tools as tools-in-use, we can understand our practice as operating equally in the ‘conceptual or symbolic mode’ in which we offer ways of thinking and means for discussion. This has implications for how we teach strategy tools in the classroom: we should not just convey the content of the tools and frameworks but also emphasize how they are used in practice: e.g., for achieving closure, for individual advancement, for delineating territories, for structuring conversation, and for achieving shared understanding. The framework proposed in this paper should provide guidelines for exploring these relationships in future research on strategy tools.

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Table 1: Dynamics of strategy tools-in-use

	Selection	Application	Outcomes
	<i>There is no one right tool for each situation. The affordances of the tools as well as the bounded rationality and constrained agency of the actors who want to use them shape which tools are selected.</i>	<i>Tools are applied improvisationally by organizational actors, both to interpret the strategic context and pursue preferences and interests.</i>	<i>Outcomes of tool use extend beyond the achievement of a strategic decision in an individual project, to individual, group, organizational and field level considerations.</i>
Affordances of tools	<p><i>The interpretive flexibility of a tool is what makes it useful. Its affordances constrain and enable action and outcomes.</i></p> <p>Arrow 1 1.1. The selection of tools may be more dependent on organizationally standardized use than on the ‘fit’ of the tool with the situation in the environment 1.2. The selection of tools may be influenced by the degree to which they are simple and offer clear visual representations, where simpler tools are easier to remember and use. 1.3. The selection of quantitative tools is attractive to users because numbers can signal rationality, but this attractiveness is offset by potentially greater difficulty in using the tool</p>	<p>Arrow 3 3.1. Tools provide a common language for strategic conversations between managers across hierarchical, functional and geographic boundaries 3.2. Tools create a space for social interactions about strategy at which actors can negotiate their different interests 3.3 The content and structure of the tool channel potential improvisations as the tool is used.</p>	<p>Arrow 5 The ‘success’ of the use of a tool at the organizational level can be measured by the degree to which: 5.1. It is adopted and routinized in organizational practice. The ‘success’ of the use of a tool at the field level can be measured by the degree to which: 5.2 It diffuses and is widely adopted in management education. 5.3 It diffuses and is widely adopted by managers in organizations.</p>
Agency of actors	<p><i>Actors select and use tools to cope with uncertainty in the environment, though this process may</i></p> <p>Arrow 2 2.1. Actors may select tools based on satisficing. They pick the first tool that they know how to use (or are familiar with) that seems to fit the problem at hand. 2.2. Actors have more or less freedom to select a tool, depending on their position in the hierarchy</p>	<p>Arrow 4 4.1. Actors use tools as interpretive devices that enable them to focus attention on and make sense of strategic issues for themselves and for others. 4.2. Actors find it useful to marshal tools to legitimate particular positions or viewpoints</p>	<p>Arrow 6 The ‘success’ of the use of the tool for actors can be measured by the degree to which: 6.1 Its use provokes new explorations 6.2 It enables interim decisions that allow a project or organization to move forward.</p>

	Selection	Application	Outcomes
<i>not be 'rational' in the classical sense.</i>	(formal power) 2.3. Actors have more or less freedom to select a tool depending on their competence in its use (expertise power)	4.3 As actors work with tools, they adapt them to fit the needs at hand.	6.3 Their 'client' is satisfied with the outcome of the project (internal client or consulting client). 6.4 They demonstrate competence. 6.5 Users achieve their personal objectives (legitimacy of position or ratification of a particular strategic choice). 6.6 Differences across actors are surfaced and resolved.

Table 2: Recursive relationships between selection, application and outcomes of tools-in-use

Arrow A: Selection-Application	Arrow B: Application-Outcomes	Arrow C: Outcomes-Selection
<p>A1: The application of a tool is shaped by which tool is selected</p> <p>A2: Tool selection is shaped at least partially by anticipation of a particular application.</p> <p>A3: Tools may be known solutions looking for problems to which they can be applied.</p>	<p>B1: As tools are applied, actors' goals and the outcomes that they are able to achieve can shift.</p> <p>B2: As goals shift, the applications of the tools may be adapted.</p> <p>B3: Actors may adapt the application of a tool based on anticipated or desired outcomes.</p>	<p>C1: When the application of particular tools has enabled actors to achieve at least some of their desired outcomes, such tools are likely to be selected for future strategy-making processes</p> <p>C2: Tool selection is shaped at least partially by anticipation of or desire for a particular outcome.</p> <p>C3: The relationship between tools and outcomes could become routinized and self-reinforcing such that it could be a source of inertia in the face of change in organizational circumstances.</p>

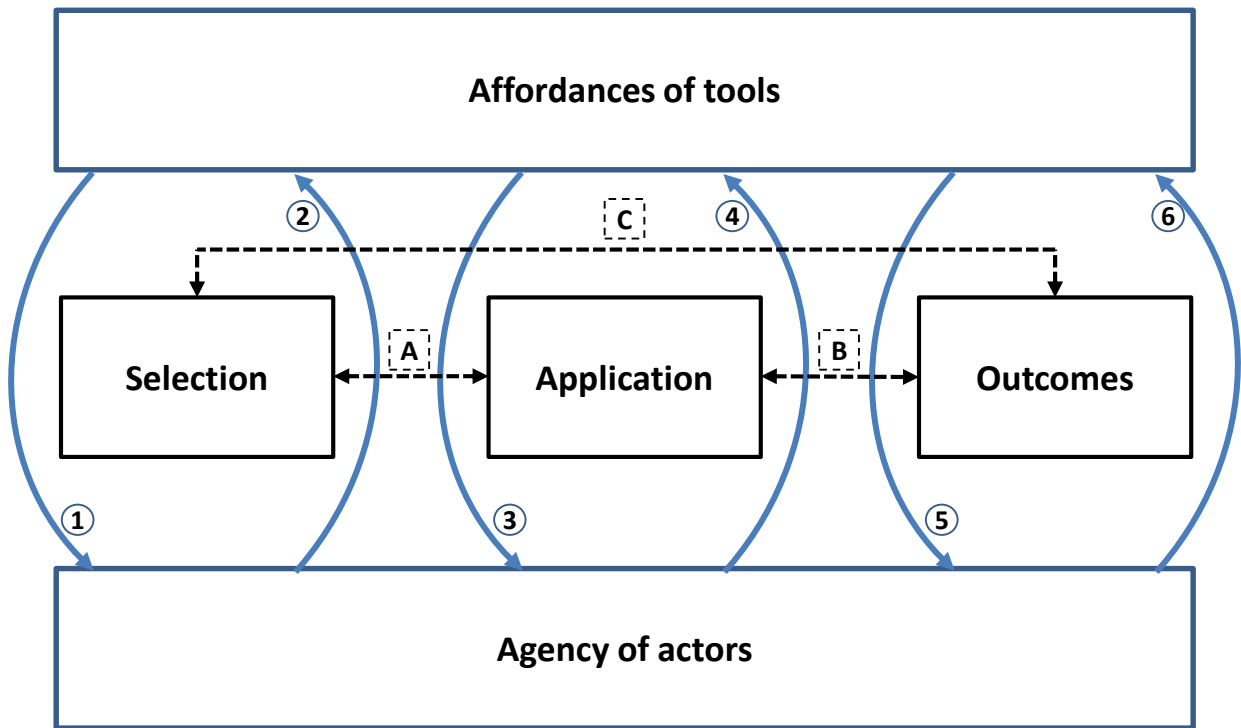


Figure 1: A framework for understanding strategy tools-in-use