OPENING THE BLACK BOX OF ORGANIZATIONAL EXPERTISE:
UNDERSTANDING WHAT FIRMS LEARN FROM THEIR PROCESS
EXPERIENCE AND HOW THAT LEARNING UNFOLDS OVER TIME

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ABSTRACT

While much research suggests that organizational processes are important and learned from experience, surprisingly little is known about the content of what is learned and how that learning unfolds over time. Using an inductive logic and in-depth case studies, we address this gap. The focal process is internationalization and the setting is six tech-based entrepreneurial firms with headquarters in three culturally distinct countries (i.e., Finland, United States, and Singapore). First, we find that firms learn specific heuristics of particular types over time using a process we label category sequencing – that is, selection and procedural heuristics are developed before temporal and priority heuristics. Second, we find that these heuristics undergo simplification cycling where they first become elaborated with new experiences, but then are made purposefully simple. Finally, we find organizations varying abstraction levels of the heuristics so that some are made more concrete and others more general. Broadly, we contribute a cognitive perspective of organizational process development involving three cognitive activities that manipulate the categorization, complexity, and abstraction of expertise, revealing important linkages between experience, cognition, and organizational action.
Organizational processes like product development, alliance formation, and internationalization are a fundamental interest in organizational theory and strategy. Indeed, much research suggests that processes are a central means by which organizations generate innovations (Ahuja and Katila 2004; Henderson and Clark 1990), adapt to their environment (Brown and Eisenhardt 1997; Karim and Mitchell 2000), and achieve superior performance (Eisenhardt and Martin 2000; Teece, Pisano, and Shuen 1997). Product development, for example, helps firms provide a flow of innovative products (Danneels 2002; Eisenhardt and Tabrizi 1995; Miner, Bassoff, and Moorman 2001), while acquisitions enable firms to expand their operations (Baum, Li, and Usher 2000). Likewise, firms use internationalization to diversify into new countries, and capture fresh scale and scope economies (Barkema, Bell, and Pennings 1996; Sapienza et al. 2006; Vermeulen and Barkema 2002; Zahra, Ireland, and Hitt 2000).

Much research argues that organizational processes are learned from experience. In support, evidence shows that, as firms produce additional cars (Levin 2000), planes (Alchian 1963), and trucks (Epple, Argote, and Devadas 1991) or repeatedly engage in acquisitions (Halebian and Finkelstein 1999), country entries (Barkema et al. 1997; Chang 1995) and alliances (Anand and Khanna 2000; Hoang and Rothaermel 2005), performance improves. Related research examines different types of experience. Studies show that various types of experience such as similar experiences (Halebian and Finkelstein 1999; Hayward 2002; Schilling et al. 2003; Zollo, Reuer, and Singh 2002) and experiences that are paced in time (Hayward 2002; Vermeulen and Barkema 2002) are particularly likely to improve performance. For instance, an intriguing study by Vermeulen and Barkema (2002) of the country entries of 22 Dutch firms demonstrates that, when internationalization experience is accumulated in a paced rhythm, performance improves. Collectively, these studies indicate a powerful link between experience and performance.

A striking feature of this research, however, is that it does not directly examine the content of what is learned and how that content evolves with experience. Rather, experience and performance are assessed. If performance increases, then learning is inferred to have occurred (Argote 1999). For example, studies link various types of experience such as similarity and pacing to performance outcomes such as profitability (Halebian and Finkelstein 1999; Vermeulen and Barkema 2002), quality (Levin 2000), productivity (Epple et al. 1991) and
success (Hoang and Rothaermel 2005). If the relationship between experience (e.g., similarity of new and past acquisitions) and outcomes (e.g., financial return of new acquisition) is positive, then it is assumed that learning has occurred and an organizational process has been improved. But, the content of what is learned is not examined.

Fortunately, related theory on routines, defined as relatively stable and predictable patterns of semi-automatic behaviors (Cyert and March 1963; Helfat and Peteraf 2003; Nelson and Winter 1982; Zollo and Winter 2002), offers some insight into what is being learned. That is, as firms gain experience with organizational processes such as hiring, internationalization, and product development (Feldman and Pentland, 2003; Pisano, 1994; Eisenhardt and Tabrizi, 1995), they develop increasingly elaborated behaviors with more and more complex steps. Theory suggests that these routines reflect the accumulation of path dependent experience, deepening memory, and enhanced reliability in the execution of these behaviors (Argote 1999; Cohen and Bacdayan 1994). Codification further facilitates the development of routines since it allows firms to make explicit the tacit knowledge embedded in experience (Zollo and Winter 2002). Thus, well-grooved, semi-automatic, and detailed behaviors in the form of routines may be what are learned from repeated experience with an organizational process.

Yet while the concept of routines is often invoked, it does not fit well with the large body of research on the relationship between the amount of organizational structure and performance. A substantial literature about effective organizing in unpredictable contexts suggests that the optimal amount of structure is likely to be moderate (Brown and Eisenhardt 1997; Pisano 1994; Rivkin and Siggelkow 2003; Weick, Sutcliffe, and Obstfeld 1999). Whether these structures are organizational processes (Burgelman 1994; Rindova and Kotha 2001), roles (Burns and Stalker 1961; Weick 1993), hierarchies (Rivkin and Siggelkow 2003), or social networks (Hansen 1999; Uzzi and Spiro 2005), effective organization involves moderate structure that leaves room for real-time improvisation (Brown and Eisenhardt 1997; Miner et al. 2001; Weick 1998). For example, Pisano (1994) found that more structured organizational processes (e.g., detailed up-front planning and well-defined analytics) led to high performance in the stable, chemistry-based pharmaceutical industry, but less structured processes (e.g. fewer scripted action steps) led to high performance in the uncertain biotechnology industry. Also, local, incremental development of routines
leaves little room for mindful cognitive activities like foresight, deliberation, and improvisation (Gavetti 2005). Yet, it seems likely that, when firms develop processes that are likely to be consequential for performance, they will engage in purposeful cognitive effort. Thus, when organizational processes require coping with unpredictable and heterogeneous experience, routines may not accurately describe what is learned from experience. Indeed, if scholars were to open the black box of learning an organizational process, they might find a subtle mix of simple organization structures and mindful, cognitive activities.

Overall, existing research suggests that organizational processes are learned from accumulated experience and that the learned content from that experience is routines, especially in predictable settings such as manufacturing where the goal is consistent outcomes. Yet while useful, it seems unlikely that increasingly complex routines are what is learned when experiences are unpredictable and heterogeneous. Most strikingly, there is no study (that we know) that tracks the content of learning an organizational process as it unfolds.

Our purpose is to explore what is learned when firms gain organizational process experience. Specifically, we ask: What content is learned and how does that content unfold over time? Consistent with prior literature, we define organizational processes as sets of actions that repeat over time and are used to accomplish some business purpose (Helfat et al. 2007; Miner et al. 2001; Pentland 1995; Pentland and Rueter 1994; Ray, Barney, and Muhanna 2004; Teece et al. 1997). Organizational processes include, for example, product development (Brown and Eisenhardt 1997; Dougherty and Hardy 1996), acquisition (Graebner 2004; Larsson and Finkelstein 1999), and internationalization (Barkema et al. 1997; Sapienza et al. 2006; Zahra et al. 2000).

Given limited prior theory and empirical evidence, we use inductive, multiple-case methods (Edmondson and McManus 2005; Eisenhardt and Graebner 2007; Eisenhardt 1989b). This choice is consistent with the counsel of learning scholars such as Pisano et al (2001: 767) who suggest, “More in-depth comparative work is required to draw more specific conclusions about the drivers of learning,” and Haleblian and Finkelstein (1999: 52) who state, “Given that process data are needed for such work (on learning), a multiple case method approach may be beneficial.” The focal process is internationalization, and the setting is six technology-based, entrepreneurial firms with headquarters in three culturally distinct countries (i.e. Singapore, U.S., and Finland).

A key theoretical contribution is highlighting the cognitive content of organizational processes, and the
development of organizational expertise. That is, firms use distinct cognitive activities to learn the heuristics underlying organizational processes, and do not simply gain experience. These cognitive activities manipulate the categorization, complexity, and abstraction of experience, revealing critical linkages among cognition, action, and expertise. Broadly, we complement the behavioral emphasis on routines (Cyert and March 1963; Helfat and Peteraf 2003; Nelson and Winter 1982; Zollo and Winter 2002) by combining insights from empirical evidence and cognitive science to sketch the micro-foundations of an emerging cognitive emphasis on heuristics within organizational processes. Thus, we add organizational processes to the emerging paradigm that places cognition at the center of innovation, adaptation, and performance (Gilbert 2006; Kaplan, Murray, and Henderson 2003; Tripsas and Gavetti 2000; Weick, Sutcliffe, and Obstfeld 2005). Our primary contribution to this perspective is enhanced understanding of the cognitive activities that underlie the development of organizational expertise.

THEORETICAL BACKGROUND

Several research streams are relevant to our research. One is organizational learning. Early studies focus on the amount of experience, particularly in manufacturing settings. This research finds that, as firms produce more airplanes (Alchian 1963), ships (Rapping 1965) or semiconductors (Chung 2001; Gruber 1994), unit cost typically decreases. For example, Rapping (1965) analyzed five years of shipbuilding productivity data for 15 emergency yards producing World War II Liberty vessels. He found that labor hours per vessel fell from an index value of 100 to 45, an output increase of 122 percent. Rapping attributed this improvement to learning. Similar studies in settings such as surgery (Edmondson, Bohmer, and Pisano 2001), plant operations (Joskow and Rozanski 1979), pizza production (Darr, Argote, and Epple 1995), alliances (Anand and Khanna 2000; Hoang and Rothaermel 2005) and internationalization (Eriksson et al. 1997) also show that performance improves as firms gain experience.

Recent research looks at types of experience. This work often relies on antecedent-behavior-consequence models. First scholars measure antecedent experience, such as the similarity of a focal acquisition (e.g., SIC code relatedness) to those completed in the past (Haleblian and Finkelstein 1999; Hayward 2002). They then measure the performance consequences of the focal acquisition (e.g., abnormal stock returns). After combining assessments of both antecedents and consequences, inferences are then made regarding the learning
that might have occurred. For example, Halebian and Finkelstein (1999) studied 449 acquisitions. They found that the more similar a firm’s focal acquisition target was to its prior targets (measured by SIC code relatedness), the better it performed (measured by abnormal stock returns). The authors suggest that firms making multiple acquisitions within the same industry benefit from being able to generalize from past acquisition experience due to similar structural features. Other studies find that aspects of experience such as varied similarity (Hayward 2002; Schilling et al. 2003), complexity (Haunschild and Sullivan 2002), sequence (Chang 1995) and pacing (Brown and Eisenhardt 1997; Gersick 1994; Vermeulen and Barkema 2002) improve performance. Thus, there is a strong link between experience and performance of organizational processes.


Recent theory blends cognition and experience in the creation of routines. For example, individuals may engage in reflection when they begin to adapt existing routines for new technology (Edmondson et al, 2001), and may jumpstart the formation of routines with analogies (Gavetti, Levinthal, and Rivkin 2005). Once begun, routines are then increasingly shaped by local experience, and become more complex, particularly when firm members codify tacit knowledge into detailed action steps (Fredrickson 1984; Narduzzo, Rocco, and Warglien 2000; Nelson and Winter 1982; Zollo and Winter 2002). For example, Kale et al. (2002) discuss how the alliance process at Hewlett Packard included extensive detail (e.g., 300 page alliance manual) while Szulanski and Jensen (2006) describe the detailed internationalization process at Mail Boxes, etc. (e.g., 330 action steps for new
franchisees). Routines are also linked to individual habits (Ashforth and Fried 1988; Nelson and Winter 1982), and so may become taken-for-granted and “habitual, requiring less and less conscious thought,” Helfat and Peteraf (2003: 1003). Overall, this stream suggests that learned content of gaining experience with an organizational process is routines that enable reliable, semi-automatic, and consistent task execution.

A third research stream focuses on the relationship between the optimal amount of organizational structure and performance. Several studies indicate that performance has an inverted U-shaped relationship with the amount of structure (Brown and Eisenhardt 1997; Rindova and Kotha 2001; Rivkin and Siggelkow 2003). Too much structure creates rigidity while too little structure engenders confusion and chaos (Weick, 1993; Kaufmann, 1994; Brown and Eisenhardt, 1998). A related finding is that the optimal amount of structure decreases with increasing unpredictability (Lawrence and Lorsch 1967; Pisano 1994). The logic is that the flexibility enabled by decreased structure becomes more critical than the efficiency enabled by increased structure, as contexts become more unpredictable.

Much empirical evidence supports this theory including research in organization studies (Weick, 1993; Tushman and O’Reilly, 1997; Miner et al 2000), strategy (Burgelman, 1990; Brown and Eisenhardt, 1998), and network sociology (Uzzi, 1997; Rowley et al, 2000). A classic illustration is Burns and Stalker (1961) who found that, in stable environments where efficiency is valuable, structured “mechanistic organization” (e.g., formal processes, strong control systems, and specialized roles) performed better. In contrast, in unpredictable environments, where flexibility is critical, less structured “organic organization” (e.g., less formal processes, looser control systems, flexible roles) led to higher performance. Similarly, in their study of product development processes in the computing industry, Eisenhardt and Tabrizi (1995) found that firms with more structured processes (e.g., refined action steps that specified transitions among various stages including prototype, design, test, and manufacturing and among different individuals) achieved better innovation in the stable mainframe sector. In contrast, less structured processes (e.g., more prototyping and improvisation of action steps) resulted in better innovation in the unpredictable personal computing sector. Overall, this stream indicates that high-performing organizational processes are “semi-structured” with room for mindful, improvisational action (Pisano, 1994; Brown and Eisenhardt, 1997; Miner et al, 2001).
Taken together, these streams suggest that organizational processes are learned from experience, and that specific types of experience such as similar, paced experiences are particularly helpful (Haleblian and Finkelstein 1999; Schilling et al. 2003). Research also suggests that organizational processes consist of behavioral routines (Feldman, 2000; Kale et al, 2002; Szulanski and Jensen, 2006). Although these routines are learned primarily from local experience (Nelson and Winter, 1982), learning can be accelerated when cognition and experience are blended (Edmondson et al. 2001; Gavetti and Levinthal 2000). Routines often become more elaborated, reliable, and taken-for granted as firms gain experience (Helfat and Peteraf 2003; Nelson and Winter 1982; Winter 1986). Finally, although routines are effective in certain contexts (Szulanski and Jensen, 2006), semi-structured processes are effective in uncertain contexts (Burns and Stalker 1961; Eisenhardt and Martin 2000).

While this research is insightful, there are open issues. First, organizational learning research infers learning from performance, but does not typically measure what is actually learned (Argote, 1999). Thus, the content of learning is not directly examined. Research on routines rests on a well-developed, theoretical foundation of local, “learning by doing” to produce increasingly elaborated routines (Cyert and March, 1963; Nelson and Winter, 1982) that is widely invoked, but rarely examined empirically (Gavetti 2005). So while routines are foundational in several theories (Feldman and Pentland, 2003), their content and change with experience are infrequently studied. Indeed, research on optimal structure suggests that routines are unlikely to be what high-performing firms learn in uncertain settings where there is a heterogeneous flow of opportunities. But this structural research usually assesses the content of organizational processes in cross-section (e.g., Uzzi, 1997; Brown and Eisenhardt, 1997). So while this work suggests insights about optimal structure, it reveals little about how optimal structure is learned as firms gain experience. Overall, the literature lacks an in-depth, longitudinal study that tracks how the content of learning an organizational process evolves as firms gain experience. Thus, we ask: What is learned as firms gain experience with an organizational process and how does that learning unfold over time?

METHODS

The research design is a multiple case, inductive study. Multiple cases allow replication logic in which cases are treated as a series of experiments, with each case serving to confirm or disconfirm the inferences drawn
from the others (Yin 1994). Although single cases can offer rich insight into specific examples, multiple cases typically generate more generalizable and accurate theoretical insights (Eisenhardt and Graebner 2007; Eisenhardt 1989b). We also rely on an embedded design - that is, multiple units of analysis: (1) country entry; (2) entry team; and (3) firm. Although complex, an embedded design improves the likelihood of inducting richer and more reliable models (Yin 1994).

The research setting is entrepreneurial firms. Entrepreneurial firms are an attractive choice for several reasons. First, their small size enables accurate observation of learning (Argote, 1999). Second, their newness allows tracking of learning from firm inception, thus avoiding left censoring issues. The focal organizational process is internationalization. This choice is consistent with the counsel of learning scholars such as Zahra (2005: 25) who observed, “We need to document what international new ventures learn in foreign markets.” Consistent with existing literature, we define internationalization as a firm’s physical entry into a foreign country through institutional arrangements (e.g., partnerships or acquisitions) for the primary purpose of enabling sales (Root 1994). While we considered studying other organizational processes such as acquisitions and product development, we selected internationalization because it is an important, but underemphasized, choice for studying learning (Autio 2005). From a methods view, internationalization is beneficial since each country entry is a discrete event that can be explored both as a single unit of analysis, and as part of a larger set of varied experiences. This flexibility allows a range of analyses of learned content. From a practical view, internationalization is a major growth avenue in the increasingly global economy (Aharoni 1966; Autio, Sapienza, and Almeida 2000; Bartlett and Ghoshal 1998; Govindarajan and Gupta 2001; Zahra et al. 2000).

Specifically, we sample six entrepreneurial firms from several technology industries: hardware devices, medical solutions, enterprise software, and security services (Table 1). We chose technology industries because entrepreneurial activity and internationalization are typically important (Shrader 2001; Zahra et al. 2000). We also chose these industries because they are likely to have high uncertainty (Eisenhardt 1989a; Rindova and Kotha 2001). From a practical view, entrepreneurial firms that emphasize technology are especially crucial drivers of growth in the global economy (Schoonhoven and Romanelli 2001). Finally, we selected technology industries with broad diversity in terms of product characteristics (e.g., products vs. services vs. software) and
industrial sectors (e.g., IT and healthcare). This variety enhances the likelihood of generalizable and robust results. We also sample two firms with headquarters from each of three culturally distinct countries (i.e., Singapore, U.S., and Finland) (Hofstede 2001). Such geographic sampling also enhances generalizability, robustness, and relevance.

We chose firms with extensive international sales (i.e., over 50 percent of revenue) in order to improve the likelihood that internationalization would be an important organizational process within the firm. Specifically, we sampled firms that had entered at least four countries (in order to ensure enough experiences so that some learning is occurring) and that were currently entering at least one additional country at the time of data collection. This combination of retrospective and real-time data is particularly valuable. Retrospective data enables more efficient collection of multiple observations (leading to better grounding and higher external validity) while real-time data collection deepens understanding about how events evolve (improving internal validity) (Leonard-Barton 1990). Further, we sampled firms where all country entries occurred within the five years (most within two years) prior to data collection. This improves the likelihood that informants can accurately recall relevant events (Huber and Power 1985).

**Data Sources**

We rely on four data sources: (1) quantitative and qualitative data from in-depth semi-structured interviews with company leaders; (2) extensive archival data including business publications, Internet sources, and corporate materials; and (3) e-mails, phone calls, and follow-up interviews to track the internationalization process in real-time and to fill gaps in accounts.

A primary source of data is in-depth, semi-structured interviews. We conducted over 65 interviews on three continents over 15 months. The first phase consisted of 15 general interviews with academic and industry leaders who could shed light on country entry. We used this phase to test our interview guide, and ensure the importance of our research question. The main phase consisted of over 50 interviews with multiple informants within each firm. We contacted the CEO to gain initial entry into each firm. We then used “snowball sampling”. The CEO identified the current and former employees who were actively involved in the country entry process, and then these employees identified others, as needed. Including both current and former employees helps to
avoid any bias associated with remaining in the company, and helps to ensure more comprehensive recall of events (Miles and Huberman 1994).

There were two types of informants: TMT members (e.g., CEO, President, CFO, and VP of International), and country-level employees (e.g., country managers and other executives directly involved in a firm’s entry into a particular country). In general, the use of multiple types of informants helps reduce potential informant bias by triangulating data across informants (Golden 1992; Miller, Cardinal, and Glick 1997). It also leads to accurate, reliable models through the use of complementary perspectives on the same events (Dougherty 1990; Schwenk 1985).

The interviews were 60-90 minutes, following an interview guide that had variations for the two informant types. With TMT members, we focused on gaining qualitative and quantitative data for the firm’s internationalization history and the content of learning across successive country entries. With country-level employees, we focused on gathering deep qualitative and quantitative histories of an entry into a specific country. Together, these two types of interviews facilitated the collection of both an overall chronology of country entries, and rich accounts for specific country entries via multiple, triangulated informants (Yin 1994). In each interview, we relied on a “courtroom” procedure where we asked informants to step through a chronology of concrete facts and events (Eisenhardt 1989b). This helps reduce subject bias (Huber 1985; Miller et al. 1997).

Both interview types used closed and open-ended questions in a three-part format. In the first part, we asked for background information on the firm, such as the firm’s overall and international strategies. In the second part, we focused on obtaining the chronology of events for a specific country entry (country-level interview), or for several entries (TMT interview). During this section of the interview we took care to avoid any “leading” of informants through questions about specific constructs, and to focus the interview on the chronology of events while avoiding broad speculation that was not grounded in specific events. The third part was closed-ended and gathered data on quantitative measures of constructs (e.g., autonomy and communication) that a priori seemed like they might be relevant. Overall, combining qualitative and quantitative data is not only consistent with inductive case methods (Yin 1994), but also provides stronger grounding of theoretical insights
(Eisenhardt 1989b). But, consistent with inductive methods, we had no a priori hypotheses.

We tape-recorded and transcribed each interview, most within 24 hours. If data required clarification, we sent follow-up emails and conducted additional interviews. We also triangulated interview data with archival data such as press releases, media reports, internal documents, presentations, and annual reports. Triangulation of data improves reliability by providing a check against the accuracy of informant responses (Jick 1979).

Throughout the data collection, we took steps to minimize informant bias. We included informants at several hierarchical levels (e.g., CEO, VP, and country-level), multiple functional areas (e.g., sales, finance, and engineering), and current and former employees. These varied perspectives help mitigate retrospective and other biases (Siedler 1974). We put the informants “back in time”, and asked them to give a step-by-step chronology of events during country entry. This emphasis on relating a history of facts (rather than, for example, broad interpretations of and speculations about an entire country entry or internationalization process) is likely to be less subject to biases and impression management (Huber 1985; Miller et al. 1997). Finally, we collected both real-time and retrospective data, an ideal combination to generate efficient data collection of more observations (thus enabling richer and more reliable grounding of the emergent findings) and real-time data mitigating retrospective bias (Leonard-Barton 1990). Together, this combination of steps improves the likelihood that the methods yield rich, detailed, and accurate accounts of learning within the firms.

**Data Analysis**

Data analysis for multiple-case, inductive research centers on developing consistent patterns that emerge across all cases. Using a well-known approach for multiple-case induction (Eisenhardt, 1989a), we synthesized all interview and archival data for each focal firm into individual case histories. Each case history describes the internationalization chronology, and details the entry timing, rationale, mode, team, and sequence of events (including insights, surprises, and mistakes) for each country entered. A primary feature of the histories is triangulation of archival and interview data in order to generate an accurate and reliable account of internationalization within each firm (Jick 1979). The individual case histories ranged between 30-60 pages, inclusive of interview quotes, summary tables of key constructs that emerged, and charts of key facts.

Consistent with inductive, multiple-case research (Eisenhardt and Graebner, 2007), we used individual
case histories for two types of analysis: within-case and cross-case. Within-case analysis concentrated on developing generalizeable constructs and unique patterns for each firm, and proceeded in an iterative fashion with data collection in order to better ground and thus improve resultant theory. The authors and three graduate research assistants read the original transcripts and the individual cases in order to develop an independent understanding of each case in light of the research question. We then reconciled these understandings. We also contacted our informants as appropriate to fill in missing data, and clarify any confusion. Incorporating these multiple perspectives enhanced our understanding of each case.

As we completed the within-case analysis, we began cross-case analysis. As is typical with cross-case analysis, we looked for the emergence of similar themes and constructs across multiple cases using a variety of lenses (e.g., headquarter, country, industry, and internationalization patterns) (Eisenhardt 1989b). To facilitate cross-case analysis, we employed the extensive use of charts, tables, and other cell designs to compare several categories at once (Miles and Huberman 1994). From the emerging patterns, we formed tentative theoretical relationships. We then refined the initial theoretical relationships through replication logic, frequently revisiting the data to systematically compare and verify the occurrence of specific themes within each case. Initial comparisons between emergent theory and data helped refine constructs, strengthen the internal validity of findings, and raise the generalizability of results. It also helped create a better fit between data and theory that reflected common patterns across the cases. We then iterated among theory, data, and extant research. Such iteration helped further sharpen findings and clarify novel insights. The result was a theoretical framework describing how the content of what firms learn from their organizational process experience evolves that fits most, and often all, of the cases (Yin, 1994).

LEARNING AN ORGANIZATIONAL PROCESS

To explore what firms learn when they gain experience with an organizational process, we took a comprehensive, emergent approach to tracking the content of that learning that is particularly appropriate in inductive theory building (Yin, 1994; Eisenhardt and Graebner, 2007). Specifically, we used open- and closed end approaches to assess behavioral and cognitive indications of learning (Huber 1991; Miner et al. 2001) as firms gained experience with country entries. We focused on learning applied to successive country entries and
so was incorporated into the internationalization process, rather than country-specific learning that was relevant in one setting (e.g., one firm learned that Japanese executives like to do business over sake, but they considered this to be a Japan-specific learning that was not taken elsewhere). Thus, we captured behavioral learning, which emphasizes patterns of action (Cyert and March, 1963; Miner et al., 2001), and cognitive learning, which emphasizes creation and change of casual theories, mental models, or memory (Huber, 1991).

We assessed behavioral learning (Cyert and March, 1963; Miner et al., 2001) by tracking behavioral consistencies in action patterns across multiple country entries. We considered learning to have occurred when at least two informants (and usually many others) described consistent patterns of behavior that occurred in at least two successive entries. To illustrate, executives at Crest entered their first country, Sweden, by sending a young, inexperienced, and inexpensive Finn to “cold-call” local companies from within the country. They engaged in these same behaviors in subsequent entries. For example, one co-founder stated, “For Germany we also sent a Finn to start with, and for the U.S. we also sent a Finn to start with. All of these Finns had very limited experience. They just had a phone book and then started cold calling (from within the country).” In their country entry chronologies several other informants independently confirmed that these behavioral consistencies occurred. For example, one country manager noted that the mode of entry into all countries “has been pretty much similar in all of the locations…cold calling (from within the country),” while another leader (co-founder) stated it was “Pretty much the same…send a Finn there, give them a phone, and have them start cold calling.”

We also assessed cognitive learning from informants’ explicit statements regarding what the firm had learned (Huber, 1991). These descriptions emerged in two ways. One, in response to our open-ended and non-directive request to describe the country-entry chronology of events, informants explicitly mentioned that the firm had learned a specific lesson in one country entry that was then used in one or more later country entries. Two, in response to our wrap-up questions at the end of the interview where we directly asked what (if anything) the firm had learned in a specific country entry, informants explicitly mentioned that the firm learned a specific lesson(s) that was applied in one or more successive country entry. As with behavioral consistencies, we considered learning to have occurred when two or more informants independently described the same learning. To illustrate, one Crest executive explicitly mentioned that the firm learned in the Czech Republic entry that they...
did not need to establish a legal entity when entering each new country. Rather, they could establish satellite offices that could be legally managed from the U.S. or Finland. They then used this lesson in their subsequent entry, Germany. He stated, “We learned from the Czech Republic and decided not to establish a legal entity in Germany. We realized that legal entity status comes with a lot of bureaucracy. It’s not worth taking that extra commitment.” Another executive corroborated, “We didn’t establish any legal entity in Germany. Company management started to realize that they can just as well manage the company and operations from two locations, Helsinki and Boston. They thought that all the other legal entities would just add complexity to the management process.”

Combining the behavioral and cognitive measurement approaches, we tracked what each firm learned during its internationalization process in successive country entries. Our two-fold approach is, thus, consistent with a comprehensive and emergent approach to construct development that is appropriate within theory-building, multiple-case research (Yin, 1994; Eisenhardt and Graebner, 2007).

Our data overwhelmingly point to portfolios of heuristics as a key aspect of what firms learned from repeated experience with new country entries. That is, while firms probably learned tacit and unarticulated knowledge, an emergent portfolio of heuristics comprises an important and measurable aspect of the learned content from repeated experience with an organizational process. Moreover, these heuristics are likely to be particularly important learned content since they are readily developed and shared collectively, and so acted upon by diverse and dispersed members. Consistent with our informants and cognitive research (Cyert and March 1963; Kahneman and Tversky 1979; Newell and Simon 1972; Tversky and Kahneman 1974), we define heuristics as rules-of-thumb that direct attention and facilitate decision-making and organizational action. We now turn to our theoretical framework that describes how portfolios of heuristics are learned during the internationalization process.

Stepping through Category Sequencing

Our data indicate that firms learn portfolios of heuristics to guide their internationalization process during successive country entries. They begin these portfolios by sequentially stepping through specific categories of heuristics (Figure 1). These heuristics are not random rules of thumb, but rather are heuristic types
that we term selection, procedural, temporal, and priority. Each type relates to a relevant activity in capturing internationalization opportunities in various countries. Data show that firms learn some of these heuristic types sooner than others. They begin with selection and procedural heuristics. Selection heuristics offer guidance regarding which opportunities to target (e.g., specific countries, focal customers) while procedural heuristics delineate actions needed to capture a focal opportunity (e.g., specification of entry mode, sales approach, pricing policy). Later, firms develop temporal and priority heuristics. These heuristics provide guidelines about timing (e.g., sequences and rhythms) and the ranking of opportunities and involve more advanced cognitive activity such as consideration of multiple time frames and multiple opportunities at once. While there is some category overlap in the data, we were surprised by the consistency of this serial pattern of heuristic formation into four relevant categories. Overall, category sequencing enables firms to focus their attention serially, lump learning content into discrete chunks, and create portfolios of heuristics that forms the rough foundation of the internationalization process.

A good example is Singapore-based Grand. One founder was 30, Taiwanese, and had worked at SAP in Taiwan. Her 40 yr. old Singaporean supervisor at SAP joined her as a founder. This executive had spent several years with SAP in Singapore, Japan, U.S., and Taiwan. The third founder was 30, Singaporean, and had worked for McKinsey in Singapore. The three founders formed a company to create supply chain software to help high-tech manufacturing firms manage their value chain by analyzing workflow data in real-time via the Internet.

Using past experiences as a springboard, the founders developed a few heuristics prior to their first country entry. One was a selection heuristic that emphasized targeting large multinational original equipment manufacturers (OEMs). The rationale was that securing business with established OEMs would give the young firm legitimacy and credibility. A founder stated, “We realized from the start it’s going to be crucial to our strategy to start working with the big boys.” The founders also added a procedural heuristic stipulating the use of a direct sales approach. This rule emerged from founders’ belief that collectively they could successfully oversee a new country’s operations on their own. Another founder stated, “We thought that being Asian and since we’d had SAP experience and knew a lot of people we’d do quite well.”

As was typical, some of these early heuristics were flawed, and so were adjusted (Table 2). For
example, after the first country entry (Taiwan), the founders realized that their procedural heuristic to use direct sales was ineffective. They observed that other international firms were having success using an indirect approach. The CEO stated, “We were struggling trying to get customers in Taiwan. We noticed that they (other firms) were handing things over to partners.” This observation prompted the founders to adjust their initial procedural heuristic from “use direct sales” to “use indirect sales that relies on partners”. The CEO noted: “Sales acquisition (in Taiwan) was so difficult for us. Sales acquisitions costs were so high we started shifting away from a direct sales model to an indirect model, to work through partners instead.” After adjusting to an indirect sales approach in Taiwan, leaders relied on the same heuristic in later country entries. For example, one manager noted that when entering the U.S., “We really looked for local partners to help us out,” while another manager recounted how the entry into Japan “is similar to Malaysia in that we worked through a partner.”

Firms usually first added selection and procedural heuristics, and then added temporal and priority heuristics later. For example, Grand leaders realized that they entered Taiwan too quickly with too many resources. One founder lamented, “I think in the beginning we should not have opened an office in Taiwan straight away. We should have looked for a stronger business case. On paper the Taiwanese market looked good. It was not until we were actually there and started doing business that we realized it was pretty hard.” Another manager agreed, “We started out with six-eight people straight away, and then we decided that the market was not ready for us.” Based on this mistake, they decided that they would “synchronize their entry timing with local market readiness” (temporal heuristic) in later entries. Thus, when entering the U.S. (second entry), they synchronized their pace with the readiness of the U.S. market by creating a slower-paced “listening post” approach that aligned their expansion timing with customer interest. The U.S. country manager described the entry:

“We actually were lying low for awhile...What we did was maintain a very slim, lighthouse-like watch post infrastructure to support our global operations in terms of inquiries, in terms of meeting the key people who were going to make the decisions. It was different than what we did in Taiwan.”

When entering China, the firm also synchronized entry with country readiness. Because the Chinese market was just beginning to show interest in B2B products such as Grand’s, executives further slowed entry speed. A founder noted, “The China market is not quite ready...so we’re moving very cautiously about going into China.”
Later when entering Japan, the firm used an entry speed between those of China and the U.S. This temporal approach took into consideration Japan’s developed market status (like the U.S.), but also its tendency for time-consuming, consensus decision-making. As the Chairman noted, “The way Japanese make decisions requires consensus, so usually it takes a longer time (than in the U.S.).”

Grand executives later added priority heuristics. Specifically, they decided that their highest priority country was Japan because it was the largest Asian market (priority heuristic). However, as they probed for early customers, they realized that Japanese customers were not interested in buying Grand products unless the firm had U.S. references. A founder stated:

“Japanese customers did not respect us when we said that we were a Singaporean company... I think it is a prejudice on their part. Japan looks to the U.S. as being at the forefront of technology, but not to the rest of Asia. They see themselves foremost in Asia. It can’t possibly be that this small company from Southeast Asia has technology that we don’t have.”

To address what Grand executives termed the “pecking order of nations,” they decided to sequence their country entries. In order to enter Japan, the firm would first enter the U.S. It would then use U.S. customers as references to enter Japan, and then use Japanese customers as references for entry into the rest of Asia (temporal heuristic). A founder noted, “If you go to Japan, you first have to have success in the United States. If you have success in Singapore, and you go to Japan, you may not be able to sell. So it means that you have to have success in the U.S., then you go to Japan, and then from Japan you can go elsewhere in Asia.” The value of temporal sequencing was proven later: “Their (Japanese customers) faces changed when we said we were a U.S. company, when we started giving out the Inc. business card. They were much more receptive then.” They also added temporal heuristics that sequenced product introductions (e.g., always start in Singapore) and entry mode (e.g., start with partners, then go direct). For example, one executive noted, “We now depend on a partner initially and then we’ll go in there and service customers directly.”

U.S.-based Center is another example. Center creates semiconductors for GPS-enabled mobile devices. Prior to their first country entry, organizational members used Taiwan for the design layout of the firm’s chips and China for manufacturing (procedural heuristics). The founder stated, “Initially, we thought the product should be designed in Taiwan and manufactured in China because of the cheap labor.” However, several quarters after their first country entry (China), the founder and his senior team noticed that China was quickly
becoming the best location for both manufacturing and design. He noted, “We found that even if they have R&D, most of the big Taiwanese companies also have their R&D centers in China. So that means that our design activity should be in China and the manufacturing is also in China.” This new information prompted them to revise their procedural heuristics: “manufacturing and design should both take place in China” (Table 2). As one executive stated, “our design activity and manufacturing are both in China.” The CEO concurred, “Taiwan is more for marketing.”

During their first country entry (China), Center also adjusted other selection and procedural heuristics. For instance, they began with a procedural rule: “Sell only semiconductors”. But after entering China, they noticed that Chinese customers had weak engineering skills that prevented them from exploiting cutting-edge technology and required Center to develop turn-key solutions. The CEO said, “In China, initially they (customers) didn’t have much design process. You had to finish the whole design for them before they could use it.” Thus, they decided not to “sell only semiconductors”, but rather “create partnerships with local chipset and software providers to offer turn-key solutions”. An executive noted:

“Our experience clearly showed us that we needed to have partnerships with other chipset and software providers to provide the total solution. We are not going into any country just having a chip and saying here’s our datasheet, good luck. We need to basically form these partnerships and make sure we could have interoperability with all the chips they (local customers) want to use.”

After adding their first selection and procedural heuristics, Center added temporal and priority heuristics. For example, during their second country entry (Taiwan), they decided that the firm’s priority should be “tier-one” countries (e.g., Japan, Germany, U.S.) because these countries were the largest markets for mobile applications. Yet, they realized that entering tier-one countries would be challenging as the young firm lacked credibility. As the Sales VP described, “If we started right off and tried to talk to Dell, they wouldn’t have given us the time of day...They won’t take you seriously until they see a validated platform.” Based on discussions with potential U.S. customers, the Sales VP decided that the firm should first sell in “tier-three” countries like Taiwan and then use those reference accounts to gain customers in “tier-two” countries like Korea (temporal heuristic that set the sequence of country entry). After gaining “tier-two” customers, the firm should then use those accounts to enter “tier-one” countries like Japan. The VP summarized, “Our marketing strategy has been trying to get the credible players from the tier-three, then tier-two countries– the big fish in the small pond like
Hyundai in Korea, and BenQ in Taiwan ...If they adopt your platform and you ship in mass production, then you leverage that to get into the tier-ones in Japan, Germany, and North America.”

Center also developed temporal heuristics to sequence product introductions (e.g., first Taiwan, then Korea, then China, etc.) and industry sectors within a country (e.g., first auto, then PDA, then mobile handset). The sequence for the former was based on decreasing engineering expertise, while the sequence of the latter was based on increasing competitiveness. To illustrate, when executives entered their fourth country (Japan), they followed the temporal heuristic related to industry sector, and so focused first on the auto sector before moving into the PDA and cell phone sectors. As one executive stated, “it is much tougher to get into Japanese handset providers in the short-term. So we’re starting with automotive.”

Center executives also added other temporal heuristics such as a rule to synchronize their new product introductions with the design pace of specific industries. For example, after entering Germany (fifth country), a marketing manager noticed that the design pace in the auto industry was nine-twelve months with significant milestones along the way. This was based on his observation that German auto customers stepped through phases before purchase (e.g., evaluation, prototyping, pre-production, and full production testing). He said, “By the time they get through the channel and build up the volume in the channel, it takes a good nine-twelve months. If by the six month they’re putting together prototype boards and they start doing pre-production manufacturing then you pretty much know that you’ve got them locked in.” Center focused on gaining this timing knowledge within industries, and then synchronized their new product introductions with the industry design cycle such that Center would be competitive every year. A leader remarked, “They (customers) put out a new product line or new set of products every year...we just wanted to put everything in place and we make sure that we catch that design cycle or else we miss out on another year of revenue. The timing on that we felt is pretty critical.”

Overall, firms begin their portfolios of heuristics by stepping through category sequencing. That is, they chunk their experiences into distinct categories of heuristics. Each heuristic category – selection, procedural, temporal, priority – relates to a type of activity that is germane to capturing opportunities (in our case, new country opportunities). For example, firms develop selection heuristics about what to target (e.g., Echo’s enter Asian countries; Grand’s focus on banks and government agencies), and procedural heuristics about how to
operate (e.g., Alta’s entry mode of acquisitions, Echo’s use of partners as its sales approach). These heuristics guide firms in the capture of particular opportunities within a larger flow of particular opportunities (e.g., new product, country, acquisition, and partnering opportunities). These heuristics give guidance for action, and so provide structure and confidence to act as new opportunities are addressed (Langer 1975). This is especially relevant in high velocity environments (i.e., high uncertainty, poor information, rapid pace) such as we studied (Eisenhardt, 1989b) where confusion and lack of confidence often delay response. For example, when U.S.-based Block was contacted by a third party in Australia who wanted to bring the firm’s enterprise software products into that country, Block’s selection heuristic of “restrict internationalization to English speaking markets” helped the firm to respond quickly even though they were unfamiliar with Australia. As the VP of International said, “We’d already decided that we’re going to attack the English-speaking markets and so it (Australia) was just too good an opportunity to miss.”

Firms also use a developmental order – moving from selection and procedural heuristics to temporal and priority heuristics. For example, Finnish-based Alta added several selection heuristics in early country entries, and then added temporal heuristics in later country entries. This order enables firms to begin with easier heuristics related to single opportunities, and then move to more difficult heuristics involving priority and temporal relationships among multiple opportunities.

Category sequencing is highly consistent with cognitive science research on effective learning. For example, recent evidence disputes the value of multi-tasking (Rubinstein, Meyer, and Evans 2001), instead suggesting that individuals encode new memories best when they bring high attention to a series of related tasks without interruption (Anderson 2000; Mintz and Schwartz 1985). Learning heuristics in a developmental order (as occurred in our firms) can facilitate this encoding because it restricts the learning focus to similar activities that can be readily compared to create more robust knowledge. Category sequencing is, thus, a particularly effective approach to create and retain learning.

Category sequencing is also very consistent with much cognitive science research on cognitive development. For example, there has been extensive research on the development of children’s cognitive abilities (Carey 1985; Inhelder and Piaget 1958; Spelke 1999). A key insight is that temporal concepts are
learned later (Fraisse 1982) such that children younger than 10 have difficulty extending their time horizons to include both past and future (Friedman 2000). Category sequencing is also consistent with the extensive research on adult cognitive development. For example, adults usually gain knowledge about what to do (selection and procedural heuristics) before they gain knowledge about when to do it (temporal heuristics) (Anderson 1982). Adults also add temporal elements to their thinking as they become more expert (Larkin et al. 1980). These and other studies, thus, offer a cognitive rationale for why temporal and priority heuristics emerge later within our firms, indicating later development of higher order thinking. This reasoning may also explain intriguing variations in our study such that founding teams with more international experience (e.g., Echo, Grand), developed temporal heuristics sooner than those with less (e.g., Crest, Alta) (see Table 3).

Finally, category sequencing is a particularly useful cognitive activity within firms. Since marshalling the efforts of members from diverse parts of the firm to integrate their knowledge into heuristics is difficult (Kogut and Zander, 1992; Nonaka, 1994; Okhuysen and Eisenhardt, 2002), category sequencing is helpful because it synchronizes the attention of members on distinct types of content at the same time. Thus, firm members are more likely to develop collective content.

**Engaging in Simplification Cycling**

After beginning their portfolios with several heuristics that form a rough foundation of the internationalization process, firms purposefully manage the complexity of their heuristic portfolios by engaging in *simplification cycling*. So while prior theory emphasizes that firms elaborate their organizational processes as they gain experience, we find that they both elaborate and simplify. Specifically, simplification cycling involves two patterns: Elaboration of heuristics, and then mindful simplification. Thus, this cycling usefully bounds the complexity and number of individual heuristics.

The first pattern, elaboration, was expected: consistent with existing literature (Kale et al. 2002; Sapienza et al. 2006; Zollo and Winter 2002), managers elaborated the number and complexity of country entry heuristics early in their experience. They did so in order to make their heuristics more complete and updated with new experiences. However, while elaboration was expected, the second pattern was not: managers purposefully simplified their heuristic portfolio later by cutting heuristics considered invalid and simplifying...
heuristics that consumed too much organizational attention (Ocasio 1999). Broadly, simplification cycling indicates that heuristic portfolios begin with simple structure, become more elaborated, and then become simpler again (Table 4, Figure 2). The overall effect is actively varying the structural complexity of heuristics.

Finnish-based Alta illustrates simplification cycling. A 50 year-old Finn with over 20 years of work experience in the Finnish retail industry founded Alta. The founder and his team developed point-of-sale software to help retailers manage their inventory. They created several heuristics prior to their first country entry. One was a procedural heuristic specifying mode of entry: “use acquisition to enter new countries”. Their rationale was that relying on acquisitions would let Alta access valuable technology and human resources in the form of host country employees who would know how to effectively conduct business in the local market. As an executive stated, “Our idea was first of all to buy the new technology.”

After the first entry (Sweden), leaders created another procedural heuristic regarding acquisitions. The CEO noticed that a key to their Swedish success was the support of target company managers, and so he added heuristics to ensure similar support in subsequent entries. As he later stated, “We are integrating the management first. We’re talking a lot with them before acquisition, trying to find out if they will back us up 100%. If they will, then we make the acquisition.” Thus, in addition to their first heuristic of “enter new countries through acquisition,” organizational leaders added another: “when doing acquisitions, ensure pre-acquisition integration with target executives.” They then added more detail to this second heuristic after entering their third and fourth countries (France and Germany). Alta executives observed problems with their acquisitions in France that signaled the need to pay attention to motivating acquired managers after the sale. This prompted the company’s leaders to revise the “ensure pre-acquisition integration” heuristic in their next entry (Germany) to include heavy investment in post-acquisition integration. Consistent with the elaborated heuristics, the VP overseeing Germany said, “I spent a lot of time in Germany after we made the two additional acquisitions to make sure that we integrated them and explained our values to them and how they would address new markets.” This elaboration added detail about cultural and systems integration to the existing procedural heuristic.

While adherence to these acquisition-related heuristics facilitated entry into Alta’s first four countries,
Alta executives decided that using acquisitions as an entry mode could be inefficient and expensive as they contemplated their fifth (U.K.) and sixth (U.S.) country entries. Thus, when entering the U.K. and U.S., they eliminated their procedural heuristics regarding entry mode from their portfolio (i.e., (1) enter through acquisition, and (2) when doing acquisitions ensure pre and post acquisition integration). The U.K. country manager described his approach, “I said, go in, establish an office, and get a presence...So we rented a small office in a serviced office with furniture, telephone lines, everything you need...I think that has saved time...I think this is the right way to do it.” Similarly, they selected the U.S. entry mode based on conditions within the U.S., not a heuristic. The CEO described:

“We had to make a decision how to establish operations in the U.S. The decision was really easy. We found very good acquisition targets but prices were sky high and it was taking too much time. So we decided to go with partners.”

Another illustration of simplification cycling is Block, a U.S.-based enterprise software firm founded by two experienced executives. One was 48, Australian, and had spent over five years working abroad. The other was 45, British, and had over 10 years of international experience. Prior to starting Block, the two founders recognized that big companies throughout the world struggled to handle vast amounts of data. Thus, they planned to build a product that met the broad business need of making quick, informed decisions based on the large quantities of information that existed in companies. Specifically, Block focused on creating CRM (customer relationship management systems that analyzed supply chains in real-time) software to help companies proactively manage their business data and forecast results. Before Block’s first country entry into Australia, the founders created a few selection and procedural heuristics. These included (1) employ a “features marketing” approach that highlights the functions of the technology, (2) use direct sales, (3) sell software to enable real time analytics, (4) target large enterprises, and (5) restrict internationalization to English speaking markets (Table 2). During their first country entry (Australia), leaders added more heuristics including (6) work with an experienced local country manager, and (7) have technology implementation partners. They then added two more heuristics after entering the U.K. (second entry). One was procedural - (8) create a strong liaison for each country within HQ. The other was temporal - (9) solidify current markets before entering new ones.
Lending support for this later heuristic, the country manager of U.K. stated, “We felt we should build up much
more serious bench strength in the U.K. before moving on to say France.”

Yet during the firm’s third, fourth, and fifth country entries, Block also simplified their heuristics. They jettisoned a few heuristics that were deemed obsolete for what the firm currently needed and what they anticipated needing in the future. To illustrate, they eliminated their selection heuristic of “restrict internationalization to English speaking markets.” While this rule provided value early in Block’s experience since it facilitated smooth entry into culturally similar countries like Australia and the U.K., it had served its purpose. Indeed, it was now problematic since it precluded the firm from taking advantage of opportunities to do business in non-English speaking, yet very attractive markets such as France, Germany and Korea (country entries 3-5).

Block also eliminated their procedural heuristic of “create a strong liaison for each country within HQ,” because it was required too much attention. Although this heuristic did help HQ leadership address the operational needs of each country, it also consumed significant time and resources. For example, a founder noted the challenge of being a liaison, “My expectation was that it (country) would be more autonomous than it ended up being. It required a lot of attention. It wasn’t really until we were going that I realized what a huge job I had to do in HQ to keep UK and to a lesser extent, Australia, in the mindset here.”

Overall, firms developed their heuristic portfolios by engaging in simplification cycling in which they bound the complexity of their heuristic portfolios by first elaborating their heuristics and then simplifying them. The rationale for elaboration is clear. As firm members gain experience, they add new heuristics and embellish existing ones in order to make the organizational process more efficient. This is consistent with internationalization research which finds that action steps for country entry become more numerous and refined over time (Aharoni 1966; Autio et al. 2000; Root 1994; Szulanski and Jensen 2006; Yip 1992).

In contrast, the rationale for simplification is more nuanced. Simplification enables managers to cope with heterogeneous experiences that can overwhelm their ability to anticipate effective heuristics for multiple situations. For example, since the internationalization process copes with extensive heterogeneity in cultural, institutional, and competitive features of different countries (Barkema et al. 1996), it is difficult to create heuristics that cover all possibilities. This is particularly true when firms such as we studied (i.e., ventures with
very new, technology-based products) also face highly uncertain markets. Many, complicated heuristics create rigidity, and so hamper adaptation to unanticipated country-specific situations (Davis, Eisenhardt, and Bingham 2007; Dougherty 1992; Siggelkow 2001). Simplification keeps the internationalization process under-specified, leaving room for improvisation to specific situations (Brown and Eisenhardt 1997; Miner et al. 2001).

Simplification is also valuable because it reflects more appropriate generalization of experience. Individuals tend to over-generalize their initial experiences, and so take learning that relates to specific situations and apply it too broadly (Haleblian and Finkelstein 1999). But as individuals and firms gain experience, they typically generalize more effectively. They become better able to discriminate between valuable lessons that transfer to many situations and idiosyncratic lessons that relate to a single situation (Haleblian and Finkelstein 1999). Consistent with this insight, we find that managers initially elaborated some heuristics in ways that later proved to be idiosyncratic to particular countries, and so then simplified them. Thus, simplification reflects growing cognitive sophistication about the appropriate generalization of particular heuristics. In line with this reasoning, we intriguingly observe that firms in which CEOs had greater international experience (e.g., Echo, Block) began to pare down heuristics sooner than those with less international experience (e.g., Crest, Alta) (see more left-centered inflection point in graphs associated with Table 4).

Simplification cycling is also highly consistent with cognitive science research that emphasizes the importance of simplicity in maintaining neural plasticity. Neural plasticity refers to the degree to which cognitive systems are able to change (Anderson 2000; Shepherd 1991), and is highly dependent on the efficient organization of the underlying systems at the biophysical level (Hawkins, Kandel, and Siegelbaum 1993; Koch 1999; Rajagopalan and Spreitzer 1997). When cognitive organization is streamlined into simple structures such as heuristics adding new information is relatively easy, and searching existing information proceeds quickly and effectively. Likewise, when the cognitive organization of internationalization experience is streamlined into fewer heuristics, it is easier to add new heuristics to memory and to access existing information. Simplification cycling, thus, lets firms add new heuristics as experience is gained, while still maintaining the simplicity necessary to use current heuristics quickly and well.

Simplification cycling is also consistent with cognitive science research that links simplicity with the
effective encoding of learning (Broadbent 1958; Miller 1956). Significant scholarship indicates that transferring new experiences from temporary “working memory” to “long-term memory” (a process called encoding) is often the critical bottleneck in learning (Anderson 2000; Craik and Lockhart 1972). Without encoding, knowledge never reaches long-term memory and is forgotten. For example, Craik and Tulving (1975) illustrate that, while working memory can cope with elaborated learning because of continued rehearsal, long-term memory more effectively encodes simple lessons (Braddeley and Hitch 1974; Broadbent 1958) and readily fits simple lessons into existing chunks of knowledge (Craik and Lockhart 1972; Miller 1956). Thus, simplification cycling produces increasingly robust portfolios of heuristics that solidify relatively quickly and are then stable over the long-term (multiple years in this study).

Finally, simplification cycling is particularly critical at the firm level. Firms tend toward incorporating the diverse experiences of too many members and elaborating too much structure (Davis et al, 2007). Indeed, creating structure is a well-known tendency as firms age. Simplification cycling counters this tendency by bounding heuristic complexity. This helps firms to avoid spinning out of control with too many heuristics that firm members add to fit their own situations, and gives coherence to the actions of dispersed firm members. Overall, simplification cycling transforms an initial portfolio of rough heuristics into a purposefully simpler portfolio with moderate structure.

**Actively Varying Levels of Abstraction**

Thus far, we have described how category sequencing translates experience into specific categories of heuristics that are associated with opportunity capture and developed over time, and how simplification cycling varies the structural complexity of heuristics. Here, we focus on how managers expand the range of abstraction of their heuristics. So rather than becoming more automatic, managers mindfully and actively vary levels of abstraction. Sometimes they lower abstraction by making an existing heuristic more concrete and sharply specified. Sometimes they raise abstraction by creating a broader, more general conceptualization of a heuristic that disassociates it from particular instances (Webster 1988 definition of abstraction). The overall effect is to introduce varied generality into the heuristic portfolio, and so increase the robustness and nuance of the resulting organizational process. Table 5 summarizes this finding (also see Figure 3).
Executives sometimes *lower* the abstraction of heuristics. Executives at Alta, for example, lowered the abstraction of their selection heuristic to focus on retail customers. While they sold to many types of retailers, they observed during entry into France that their product particularly appealed to the grocery sector. Before their next entry into the U.S., the Deputy CEO commissioned a market study that identified two strong U.S. competitors who also sold into the broad retail industry. While they believed that Alta’s supply chain software solution was superior, they also recalled their French experience and decided to specify more sharply their selection heuristic for targeting company opportunities for entry into the U.S. and subsequent countries in order to improve the likelihood of success. Thus, they changed the abstraction in their heuristic from the more general “retail customers” to the more concrete “grocery customers” (lower abstraction). The Deputy CEO explained: “Our solution is able to provide for a wider market... But we decided that we would focus on this market (grocery) because that would be quite secure. I was sure that we would have no problem.”

Executives at Grand also lowered the abstraction of a key selection heuristic. Early on, they focused their selection of country opportunities for their supply-chain software broadly on Asia. As time went on, they saw promising activity emerge around an e-business standard called Rosetta Net. Because the founders had excellent ties with the Rosetta Net organization in their home county of Singapore and were very successful in using the standard by chance in Taiwan (first country entry), they decided to “ride on the coattails of this new international standard.” Thus, they went from the more general selection heuristic of “Asian countries” to the more concrete heuristic of “Rosetta Net countries.” A senior manager stated, “Rosetta Net is the entry point for us.” Thus, when Rosetta Net opened an office in Malaysia, Grand soon followed. The CEO explained, “We saw the opportunity with this new standard being taught to Malaysia. That’s how we started moving in.” When Rosetta Net set up an office in the Philippines several quarters later, Grand again followed. A founder recalled, “The reason we’re going to the Philippines is Rosetta Net.” Overall, this selection heuristic more explicitly focused country selection within Grand’s internationalization process than its more general, prior heuristic.

Conversely, executives sometimes *raise* the abstraction of their internationalization heuristics. Echo illustrates. The two founders of Singapore-based Echo had the goal of helping customers manage information security risks. One founder was 47 and had worked for Hong Kong Telecom for 21 years. The other was 45 and had been regional VP for IBM Asia, overseeing 13 countries. Prior to their first country entry, they created
several selection and procedural heuristics. For example, since they saw that Singaporean government and financial institutions placed very high value on protecting their data and had the largest, most recession-proof budgets for technology, they speculated that these same types of customers would generate high demand outside Singapore. Thus, the founders confidently decided to target government and financial institutions, a selection heuristic. The CEO recalled, “Look at who cherishes the information more. If we talk to small solo enterprises they don’t even bother, but banks and government care… We predicted that would happen.” Another executive added:

“Banks have the money to spend, so you have to focus on them. Government is again by design…If so much [data] is going through the IT infrastructure, then protection is needed. We know our services, we know who needs it, and who can pay for it.”

However, after entering their second country (Malaysia), the CEO realized that Malaysian government accounts were reluctant to turn over IT security to Singaporean firms because of tenuous cross-border relations. This inability to gain government customers triggered his reflection on the company’s target customer. He became more thoughtful regarding both the value of his firm to customers (i.e., protection of extensive proprietary information) and the source of attractiveness of customers to him (i.e., ability to pay). He realized that, while government and financial institutions did indeed value protection of information assets and could usually pay, a more abstract category (i.e., large and financially stable firms) was more relevant. Thus, instead of targeting governments and banks, management raised the abstraction of their selection heuristic to “large organizations with proprietary information and the ability to pay”. This higher abstraction continued to provide guidance regarding types of target customers, but also allowed managers to flexibly pursue a variety of customers depending upon country specifics. As a result, the firm was able to “cater to the region” as one leader stated, and take advantage of opportunities with big insurance companies in Malaysia, giant manufacturing firms in Japan, state-owned enterprises in China, and energy firms in Saudi Arabia.

Echo also raised the abstraction level of another key selection heuristic. When the firm entered Malaysia, the country manager was surprised that few companies wanted to purchase the company’s 24x7 security monitoring solutions. After discussions with local customers and thoughtful reflection, he realized that the problem was Malaysia’s weak technology infrastructure. As he said, “Malaysia is basically still a developing
country and there is a lot of security infrastructure that was not set up...Therefore, there was nothing for us to monitor.” To help local firms create a security infrastructure and build Echo’s sales, the country manager requested resources to backward integrate into security products such as firewalls and intrusion detection. This experience caused corporate executives to raise the abstraction of a key procedural heuristic for Malaysia and later country entries. The more specific “sell 24x7 security monitoring services” became the more abstract “sell security” that enabled selling software products and integration services in Malaysia, security-related hardware products in China (a difficult country for selling software), and opened the door to later sales of the original security monitoring services in these countries. A leader noted, “Now we have a full spectrum of info-security.”

Crest executives also actively varied their heuristic abstraction by making several heuristics more abstract. Three young entrepreneurs (about 25 years old) who had recently graduated from Helsinki University of Technology founded Crest with the intention of creating a software solution to expedite drug discovery within the pharmaceutical industry. The founders developed technology that allowed patients, research professionals, and data managers to capture quickly and report accurately clinical data through PDAs, cell phones, and computers during phase-three clinical trials.

When entering their second country (U.S.), a founder relied on an established procedural heuristic: “hire strong locals based on online resources”. This heuristic was highly effective in Sweden (prior country entry) for hiring local employees with both clinical development and technical skills. But in the U.S., following this heuristic led to several poor hires. From this experience, the founder became more attentive to his hiring heuristic. He decided that the existing heuristic needed to change in order to emphasize effective local hiring without regard to source. Thus, the TMT raised the level of abstraction of the prior heuristic from “hire strong locals based on online resources” to the more general “hire strong locals.” This new heuristic focused attention on the overarching aim regarding hiring, but did not prescribe how it should occur. This created both greater mindfulness about hiring (e.g., forced thinking about how to achieve the aim), and greater autonomy for improvising hiring specifics according to the unique circumstances of each country. So in the U.S., management turned to its seasoned board of directors to find strong local hires, while in Germany they used headhunters (not online resources, not board of directors) to do the same.
Overall, firms continue to develop their portfolio of heuristics by actively varying abstraction levels. As firm members strain to assimilate the heterogeneity of their experiences as they enter more countries, varying abstraction levels helps to cope with this variety. Sometimes they lower heuristic abstraction to focus attention sharply. Concrete heuristics enable concentration of efforts, and improved efficiency in a focused area that is likely to be successful (e.g., Alta’s grocery sector). Sometimes, they raise heuristic abstraction to provide more flexibility, yet retain coherence. Raising the abstraction level maintains continuity across diverse experiences, and thus helps to unify the collective cognitive understanding of the firm. Although specifics may be unique, there is coherence at a higher level. Raising abstraction allows for improvised action within an overarching structure that keeps behavior bounded (Miner et al. 2001). This enables organizations to take greater advantage of unexpected events “on the fly” while still maintaining some degree of efficiency and coherence.

Together, actively raising and lowering abstraction enables firms to tailor their heuristics more appropriately by picking where to be focused, directive, and concrete, and where to be general, improvisational, and abstract. So, for example, Crest lowered the abstraction levels of several heuristics to concentrate on the Top 20 pharma companies and the direct sales channel, but raised the abstraction of several others to create flexibility around device types in integrated data collection, and approaches to hiring top local individuals.

A corollary of actively varying abstraction is mindfulness. As a firm accumulates a history of unique country experiences, firm members can create coherence among those experiences by viewing them with a more abstract lens. But when actions are needed, they also actively consider both what to do, and how those actions align with heuristic guidelines. Thus, varying abstraction encourages individuals to become more attentive, purposeful, and conscientious – in short, mindful - about behavior (Langer 1989; Ryle 1949; Weick et al. 1999). Mindful action is also crucially distinct from routine action. Routine action relies on the familiar, focuses on particular solutions, and involves acting “in a semi-automatic way even in front of novel situations” (Narduzzo et al. 2000: 43). The result is reduced attention, habitualness, and failure to recognize differences (Gersick and Hackman 1990). Mindful action, in contrast, involves conscious engagement, alertness to change, and updated learning. Varied abstraction enables individuals to better create nuanced responses that are more pertinent and precise for unique situations. As a founder observed, “We have to understand individual countries – their
actively varying abstraction levels is highly consistent with cognitive science research that links increasing abstraction with cognitive sophistication. Abstraction involves subtle sorting of relevant, but often hidden, structural features from irrelevant surface features (Hinds et al., 2001). As such, abstraction helps to limit inappropriate generalization that results from paying too much attention to similar, surface features and too little attention to deeper, dissimilar features (Haleblian and Finkelstein, 1999). Over-generalization based on similar surface characteristics is common among novices (Haleblian and Finkelstein, 1999). Hence, the higher-order skill of raising abstraction may be one reason why firms often lowered the abstraction of their heuristics sooner, and raised abstraction later in their experience (Table 5).

Conceptualizing at a more abstract level also enables firm members to move beyond the functional and operational fixity of conventional thinking to engage in more innovative problem solving. For instance, in a classic psychology experiment, Dunker (1926) gave subjects a box of nails, a candle, and matches, and a few other items and asked them to attach the candle to the wall so that it would not drip. He found that subjects’ ability to view the empty nail box as an abstract shelf that could be nailed to the wall was critical in solving the problem (Dunker, 1926). Likewise, Hinds and colleagues (2001) found that more abstract instructions allowed individuals to perform dissimilar tasks more effectively, and was characteristic of higher cognitive sophistication.

The broader finding that firms both raise and lower abstraction is also highly consistent with cognitive science research about experts. For example, expert mathematicians (Schoenfeld and Herrmann, 1982) and computer programmers (Adelson, 1981) are able to search among both highly concrete characteristics (e.g., on the basis of C++ syntax) and more abstract notions (e.g., on the basis of computational principles) for appropriate solutions. That is, experts are more cognitively flexible across levels of abstraction than are novices, and so are more facile at being both concrete and abstract.

Finally, heuristics of varying abstraction are particularly critical at the firm level. That is, heuristics with varying abstraction also facilitate fit with individuals at multiple hierarchical levels (Nonaka, 1994; Okhuysen and Eisenhardt, 2002). For instance, corporate executives may rely on more abstract heuristics to guide strategy
(e.g., avoid regulated environments), while functional managers may rely on more concrete heuristics (e.g., cold-call with young salespeople). Overall, varying abstraction of the heuristic portfolio increases the robustness of the internationalization process to address more varied opportunities, and raises the cognitive sophistication of the broader firm.

**DISCUSSION**

Our primary theoretical contribution is to highlight the cognitive content of organizational processes, and the role of organizational expertise. Although prior theory emphasizes that the learned content of process experience is routines (Nelson and Winter, 1982), we find that that firms learn increasingly sophisticated portfolios of heuristics that guide, but do not prescribe, actions to take when engaging in an organizational process. More broadly, the fundamental insight is that learning an organizational process involves thoughtfully developing organizational expertise. By expertise we mean consciously accumulated, specialized skills that represent mastery of a particular organizational process, not a set of routine behaviors that are semi-automatically repeated.

A related contribution is an emergent theoretical framework that describes the cognitive activities by which portfolios of heuristics are learned and expertise is developed. Prior theory emphasizes that organizational processes become increasingly complicated and habitual as experience is gained (Helfat and Peteraf 2003; Szulanski and Jensen 2006). In contrast, our theory emphasizes that learned content reflects growing cognitive sophistication, moderate heuristic complexity, and the development of organizational expertise. Our framework has three elements.

First, firms begin learning an organizational process by *category sequencing*. That is, they translate their experiences into distinct types of heuristics that are rules of thumb for guiding action. These categories (i.e., selection, procedural, temporal and priority) correspond to relevant activities for the capture of internationalization opportunities. They create these heuristics in a developmental order that promotes effective learning. Sequential focus is effective because firm members pay attention to specific aspects or “chunks” of experience at time, rather than the whole experience at once (Rubenstein et al, 2001). It is also consistent with cognitive development – i.e., firms begin with easier, lower-order heuristics about single opportunities such as
what to do (i.e., selection) and how to do it (i.e., procedural), and then add more difficult, higher-order heuristics about when to act including multiple time frames and opportunities (i.e., priority and temporal heuristics) (Anderson, 1982; Freedman, 2000). Category sequencing, thus, creates an increasingly sophisticated portfolio of heuristics that saves time and effort (Eysenck and Keane 1995; Tversky and Kahneman 1974) while forming the rough foundation of an emergent process.

Second, firms continue to build their portfolios of heuristics by simplification cycling. That is, rough heuristics are elaborated with new experiences, but also kept purposefully simple. This activity is a primary means by which new experiences are incorporated into existing heuristics while bounding heuristic complexity. Simplification cycling makes heuristic structures “plastic” – i.e., able to incorporate lessons from new experiences, yet also able to delete obsolete lessons (Anderson 2000). This avoids the complexity trap of ever increasing elaboration by many firm members. Simplified content is also easier to encode into long-term memory, and so improves the retention of learning (Craik and Lockhart 1972). In contrast, prior theory emphasizes that organizational processes become more complicated and elaborated over time (Cyert and March 1963; March and Simon 1958; March, Schulz, and Zhou 2000; Narduzzo et al. 2000; Nelson and Winter 1982; Szulanski and Jensen 2006). While such routinization may be effective in stable settings, simplification cycling enables updated, yet moderate structural complexity that is more effective in unpredictable situations. As Echo’s CEO noted, “There is no unified model (for internationalization). It’s highly heterogeneous…Different country, different model. It’s got to be very dynamic.”

Third, firms continue learning an organizational process by actively varying abstraction. That is, they artfully increase the generality of some heuristics, while decreasing the generality of others. Lowering abstraction focuses attention sharply on actions that are most likely to be successful. Raising abstraction enables firms to address flexibly opportunities, while maintaining coherence. Together, a range of abstraction levels allows firms to “fine tune” their heuristics such that they are concrete, directive and specific in some areas, but general, improvisational, and abstract in others. Thus, they lay the foundation for a more robust organization process that can cope with heterogeneous opportunities such as multiple country entries. Greater abstraction is also associated with more effective generalization, and more innovative problem solving (Dunker 1926; Hinds,
Patterson, and Pfeffer 2001). Facility with a range of abstraction levels (from the very concrete to the highly abstract) is also a characteristic of being an expert (Adelson 1981). Thus, varied abstraction is consistent with growing cognitive sophistication and the mastery of expertise.

Overall, we find that each of these three cognitive activities adds a layer of cognitive sophistication to the organizational process, transforming firms from novices to experts. In general, our expertise-based view provides an empirically grounded and nuanced micro-foundation for how processes are learned that provides a cognitive complement to the behavioral emphasis in the routines-based view (Ethiraj et al. 2005; Helfat and Peteraf 2003; Nelson and Winter 1982; Tsang 2002; Zollo and Winter 2002).

Towards a Richer View of What is Learned: Cognitive Content of Organizational Processes

A central contribution of this study is reframing the content of organizational processes. Our study suggests that firms learn heuristic portfolios and that these portfolios are central to the content of organizational processes. These portfolios have a common underlying structure, combine best practice with firm-specific uniqueness, and focus on opportunity capture. Table 6 summarizes our perspective.

First, organizational processes rely on specific heuristics. They are not unspecified behavioral patterns, vague units of organized activities, or unclear embedded practices that enforce highly predictable actions (Dosi et al. 2000; Helfat and Peteraf 2003; Nelson and Winter 1982; Priem and Butler 2001; Williamson 1999). Rather, organizational processes rely on clear, often deliberately selected heuristics that relate to specific streams of opportunities (e.g., new country entries, new product development projects, new alliances). Examples of heuristics include Alta’s “Use acquisitions to enter new countries, Center’s “Develop the auto sector first, then PDAs, then mobile terminals,” and Block’s “Restrict internationalization to English speaking markets.”

Second, the heuristics that underlie organizational processes have a common structure across firms. That is, firms develop similar types of heuristics including procedural, selection, priority and temporal heuristics. Thus, while theoretical writing suggests that processes are idiosyncratic to a particular firm (Barney 1991; Helfat and Peteraf 2003), there is a strikingly similar structure across firms. Finally, the content of organizational processes combines best practice and uniqueness. So, while some heuristics reflect best practice across firms (e.g., pre and post acquisition integration), others are unique to a focal firm (e.g., particular country entry
sequence). Overall, their importance, uniqueness and likely inimitability suggest that processes are more than just a means to implement strategy (Barney 1991; Montealegre 2002). Rather, they may be the strategy of firms, especially when learning a particular process is crucial (see Table 1). Consistent with this view, one leader noted how internationalization was the crux of his firm’s strategy when he said, “Internationalization is vital, it’s the cornerstone…it’s the only way to go forward.”

Third, the content of these heuristics centers on opportunity capture. Internationalization, acquisition, alliance, product development and other organizational processes generally involve an over-abundant flow of opportunities with often limited duration, particularly in uncertain and heterogeneous situations such as we studied. We find that firms develop types of heuristics that guide action in the selection, execution and timing of opportunity capture (in our study, new country entries). While these heuristics may not always be correct, we do observe that firms actively update their heuristics based on new insights and experiences. Also in companion paper (not cited to retain anonymity), we find that the more cognitively sophisticated heuristics structures that we observe in this paper are associated with higher-performing country entries.

Overall, our emphasis on heuristics to capture unique opportunities contrasts with routines for repeated execution of related tasks. While the goal of the former is variance creation and novelty such as developing a string of innovative products (Brown and Eisenhardt 1997), engaging in a series of unique acquisitions (Karim and Mitchell 2000), and entering promising geographic markets (Zahra et al. 2000), the goal of the latter is variance reduction and repeatability such as consistent surgical procedures (Edmondson et al, 2001), making the same type of acquisitions in the same industry (Haleblian and Finkelstein 1999), and continuing the same type of product development projects with the same clients (Ethiraj et al. 2005). Collectively, these insights about the learned content of organizational processes points to a more precise conception of organizational processes than unspecified or idiosyncratic behavioral patterns. They also suggest that, although routines may be learned in stable settings, heuristics may be learned in uncertain ones.

Opening the Black Box of Organizational Expertise

Finally, our insights on organizational processes tie to the cognitive science research on expert performance (Ericsson et al. 2006; Ross 2006). Just as biologists use drosophila (fruit flies) as the canonical
“experimental model” (Ross 2006), cognitive scientists use chess-players to paint a precise picture of being an “expert”. Chess is the canonical context because of its clear performance outcomes (wins, losses, stalemates), ratings (numerical scores), and ready-made designations of expertise (novice, master, grandmaster, etc.).

We know, for instance, that chess expertise develops over years of effortful study, sometimes called the “10-year rule” (Newell and Simon 1972). Effortful study is defined as consciously making sense of prior experience and applying related solutions to new problems (Ericsson, Krampe, and Tesch-Romer 1993). As a result, ten years of effortful study can produce experts, while ten years of routine play may not significantly improve performance (Ericsson et al. 1993; Hayes 1981). Thus, active cognitive engagement, not simply gaining experience, is critical to developing expertise (as we observed). We also know that novices, masters, and grandmasters engage in distinct cognitive activities. In an insightful study, de Groot (1978) found key differences between masters and novices – e.g., masters have a greater repertoire of possible moves, and envision sequences of moves. Thus, masters have a more complicated and temporal understanding of the game than novices (also as we observed). Intriguingly, however, a key difference between masters and grandmasters is not the number of moves considered, but rather their quality (Charness 1981; de Groot 1978). How do grandmasters generate “better possibilities”? Research indicates that experts possess more sophisticated knowledge of chess strategies (Schultetus and Charness 1999). For instance, experts “chunk” many moves into abstract strategies such as “King’s Gambit” and “Fischer Defense” which simultaneously simplifies elaborate moves and increases their generality (Miller 1956; Newell and Simon 1972). Finally, intriguing neuro-imaging studies have linked expertise to the ability to quickly access, change, and work with abstract strategies stored in long-term memory (Ericsson and Kintsch 1995; Kaufmann 2002). Such changes make elaborated strategies such as the “Berlin Defense…deferred” possible in real-time.

Consistent with research on expertise, we also find that firms manage the complexity, categorization, and abstraction of their developing expertise. But individuals are not organizations. Rather, in our study, organizational expertise centers on the capture of complex opportunities by multiple individuals over time, not individual problem solving. Nonetheless, the development of heuristics portfolios does roughly track that of developing individual expertise. Moreover, these heuristics and the cognitive activities by which they are
developed do have features that are particularly helpful in firms. For example, heuristics that are simple and organized into distinct categories may be more easily remembered by dispersed firm members (Moorman and Miner 1998; Walsh and Ungson 1991). Simplification cycling may help to mitigate the firm-level tendency of members to complicate organizational structure and to add their own embellishments (Rudolph and Repenning, 2002). Finally, varying abstraction may be a solution to the firm-level problem of hierarchy in which different levels understand information at different levels of detail and abstraction (e.g. corporate executives v. country managers (Haleblian and Finkelstein 1999)). Although speculative, it is possible that an organizational expertise perspective may underlie other important questions in strategy and organizations such as firm profitability (Cockburn, Henderson, and Stern 2000; McGahan and Porter 1997) and adaptation (Aldrich 1999; Eisenhardt and Tabrizi 1995). If future research validates our view, organizational expertise could be an essential topic in the growing renaissance of organizational cognition research (Garud, Kumaraswamy, and Nayyar 1998; Gavetti 2005; Kaplan et al. 2003; Tripsas and Gavetti 2000; Walsh 1995).
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Figure 1. Sequencing Categories

Selection Heuristics
"Boundary Rules"

Procedural Heuristics
"How-To Rules"

Temporal Heuristics
"Timing Rules"

Priority Heuristics
"Priority Rules"

Time

Figure 2. Simplification Cycling

Beginning Rough Heuristics

Simple Heuristics

Elaborate

Complex Heuristics

Simplify

Figure 3. Varying Abstraction

Increasing Abstraction

Time
<table>
<thead>
<tr>
<th>Company</th>
<th>HQ country</th>
<th>Product</th>
<th>Yr founded/ Yr of 1st entry</th>
<th>Actual country entries (in order)</th>
<th>Cultural distance from HQ</th>
<th>2003 sales</th>
<th>2003 employees</th>
<th>Interviews #</th>
<th>Types</th>
<th>Average age of founder(s)</th>
<th>Importance of internationalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest</td>
<td>Finland</td>
<td>Multi channel clinical data capture solutions</td>
<td>2000/2000</td>
<td>Sweden U.S. Czech Republic Germany U.K</td>
<td>0.74 1.37 1.13 1.21 1.70</td>
<td>$9.3M</td>
<td>75</td>
<td>5</td>
<td>2</td>
<td>26</td>
<td>“It’s vital, it’s the cornerstone… internationalization as the only way to go forward.”</td>
</tr>
<tr>
<td>Alta</td>
<td>Finland</td>
<td>Supply chain software for the retail industry</td>
<td>1997/2000</td>
<td>Sweden Norway France Germany U.K U.S.</td>
<td>0.74 0.29 1.22 1.21 1.70</td>
<td>$93M</td>
<td>495</td>
<td>6</td>
<td>2</td>
<td>50</td>
<td>“The reason for listing was to become international. Then we made the plan for how to become international.”</td>
</tr>
<tr>
<td>Block</td>
<td>U.S.</td>
<td>Real time analytics (supply chain, CRMs)</td>
<td>1996/1999</td>
<td>Australia U.K. France Germany Korea</td>
<td>0.02 0.08 1.54 0.41 3.39</td>
<td>$8.5M</td>
<td>65</td>
<td>5</td>
<td>2</td>
<td>47</td>
<td>“Ultimately you need to become global.”</td>
</tr>
<tr>
<td>Center</td>
<td>U.S.</td>
<td>Wireless chips for mobile devices</td>
<td>1999/2001</td>
<td>China Taiwan Korea Japan Germany</td>
<td>3.01 2.80 3.39 2.63 0.41</td>
<td>$1M</td>
<td>100</td>
<td>4</td>
<td>2</td>
<td>60</td>
<td>“We were founded from the beginning to be a multi-site international company.”</td>
</tr>
<tr>
<td>Grand</td>
<td>Singapore</td>
<td>Enterprise software focusing on supply chain integration</td>
<td>2000/2000</td>
<td>Taiwan U.S. Malaysia Japan China Philippines</td>
<td>1.75 3.41 0.85 5.15 0.47 1.02</td>
<td>$1.8M</td>
<td>55</td>
<td>6</td>
<td>2</td>
<td>34</td>
<td>“Our business plan has always had an international perspective.”</td>
</tr>
<tr>
<td>Echo</td>
<td>Singapore</td>
<td>IT security monitoring</td>
<td>2000/2000</td>
<td>Hong Kong Malaysia Japan China Saudi Arabia</td>
<td>0.28 0.85 5.15 0.47 1.11</td>
<td>$3.2M</td>
<td>100</td>
<td>4</td>
<td>2</td>
<td>46</td>
<td>“International expansion is one of the key components in our expansion plan.”</td>
</tr>
</tbody>
</table>
Table 2: Sequencing Categories (Selection and Procedural Heuristics)

<table>
<thead>
<tr>
<th>Company</th>
<th>Starting heuristics</th>
<th>Quotes</th>
<th>Unexpected heuristic errors</th>
<th>Country</th>
<th>#</th>
<th>Error</th>
<th>Adjustment to starting heuristics based on error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest</td>
<td>Selection heuristics  • Enter countries with lots of pharma activity  • Target pharmaceutical companies  • Promote electronic diary solutions to customers  Procedural heuristics  • Use standard criteria to qualify customers  • Cold calling by one aggressive young Finn with a phone book</td>
<td>“Even before we did our business plan, we decided there is no way to just focus on Scandinavia.” “Let’s say we are qualifying a customer…in the early stages one of the guidelines was just to ask if they know what an electronic patient diary is and if they have seen it before.” “Cold calling, that’s what it was in the very beginning. Also not too senior person because we didn’t want to spend too much money.”</td>
<td>Czech Republic</td>
<td>3</td>
<td>Selection heuristic  Tried to sell in a country with extensive pharma activity, but small market  Procedural heuristic  Used the standard criteria of “have they used a patient diary before” to qualify customers but this did not assess customers’ budget for related services.</td>
<td>Realized the need to sell in countries with lots of pharma activity and where rich pharma firms had headquarters  “We realized that the potential market in the Eastern European countries and with companies based there is very small.” Created new budget related criteria to qualify customers.  “We are more specifically looking at their exact study volume by therapeutic area, their related budget…we learned to focus on that particular process on the way, so we did not know earlier.” “We learned how to really know whether the client is buying or not and whether they are serious and they have the budget to buy.”</td>
<td></td>
</tr>
<tr>
<td>Alta</td>
<td>Selection heuristics  • Restrict internationalization to Scandinavia  • Target wholesalers and independent retailers  • Push enterprise software  Procedural heuristics  • Use acquisitions to enter new countries and gain new technologies  • Focus on three items: reducing stock, controlling inventory, and improving replenishment process</td>
<td>“I remember when all these analysts were blaming us that we are too conservative because the markets are in the US. So we started with Sweden, which is closest here. I said that we have to have the learning process.” “Our idea was first of all to buy the new technology.”</td>
<td>Norway</td>
<td>2</td>
<td>Selection heuristic  Entered a Scandinavian country that was too small to justify a physical presence  Selection heuristic  Selling to independent retailers in Norway was taking too long</td>
<td>Realized the need to focus on physical presence in large markets, and restrict presence to distributors and partners in smaller markets  “The Norway market is really small, so it’s not our strategy to be there ourselves.” Realized the need to eliminate focus on local retailers and focus instead on global retailers where the sales cycle is faster.  “Most of the Norwegians chains are mixed of franchising and integrated…So when we were selling in Norway, it was a much slower process (than in Finland) because first you have to sell to wholesalers and then to the independent shopkeepers.”</td>
<td></td>
</tr>
<tr>
<td>Block</td>
<td>Selection heuristics  • Restrict internationalization to English speaking markets  • Target large enterprises  • Sell enterprise software to enable real time analytics  Procedural heuristics  • Focus on a features selling approach that highlights detail and functions of technology  • Use direct sales</td>
<td>“We had already decided that we were going to attack the English-speaking markets…That was a no-brainer.”</td>
<td>Australia</td>
<td>1</td>
<td>Procedural heuristic  Tried to keep too much control over sales (direct approach)</td>
<td>Understood that the firm could save money and reduce risk by using an indirect sales approach (vs. direct)  “…change from direct to indirect…looking at the model as a result of the success in the Australian marketplace.”</td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>Starting heuristics</td>
<td>Quotes</td>
<td>Unexpected heuristic errors</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Center</strong></td>
<td><strong>Selection heuristics</strong>&lt;br&gt;• Enter countries that have original device manufacturers (ODMs) and original equipment manufacturers (OEMs)&lt;br&gt;• Sell only semiconductors</td>
<td>“You get companies like Dell, Apple, Microsoft X-Box, for example. Right now, Dell, Apple, HP, Gateway, these guys are all channels – becoming OEM channels.”&lt;br&gt;“Mode of entry is direct sales”&lt;br&gt;“We thought the product should be designed in Taiwan and manufactured in China…”</td>
<td><strong>Country</strong></td>
<td><strong>#</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Procedural heuristics</strong>&lt;br&gt;• Use Taiwan for engineering architecture and China for manufacturing&lt;br&gt;• Use consultant to provide insight about local market and develop relationships with distributors&lt;br&gt;• Use direct sales&lt;br&gt;• Emphasize low cost</td>
<td><strong>Country</strong></td>
<td><strong>#</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Country</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>China</strong></td>
<td></td>
<td>1</td>
<td><strong>Procedural heuristic</strong>&lt;br&gt;Having R&amp;D done in Taiwan was less effective than having it done in China</td>
<td>Realized that their understanding of China was dated and that it was better to have design and manufacturing done in China.&lt;br&gt;“Our design activity and manufacturing are both in China.”&lt;br&gt;Discovered that they needed to offer a total solution&lt;br&gt;“Our experience…clearly showed us that we needed to have partnerships with other chipset and software providers to provide the total solution. We are not going into any country just having a chip and saying here’s our datasheet, good luck”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>U.S.</strong></td>
<td></td>
<td>2</td>
<td><strong>Procedural heuristic</strong>&lt;br&gt;Tried to sell direct, not with a partner</td>
<td>Learned that selling through a partner at entry led to faster sales early on&lt;br&gt;“We started shifting away from a direct sales model to an indirect model, to work through partners.”&lt;br&gt;Learnt that the firm should target both large OEMs and their manufacturing suppliers – hub and spoke model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Grand</strong></td>
<td><strong>Selection heuristics</strong>&lt;br&gt;• Stay Asia focused&lt;br&gt;• Promote B2B e-collaboration software&lt;br&gt;• Target large, multinational OEMs</td>
<td>“We realized from the start that it’s going to be crucial to our strategy to start working with the big boys.”&lt;br&gt;“We went direct in Taiwan.”</td>
<td><strong>Country</strong></td>
<td><strong>#</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Procedural heuristics</strong>&lt;br&gt;• Use direct sales approach</td>
<td><strong>Country</strong></td>
<td><strong>#</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Taiwan</strong></td>
<td></td>
<td>1</td>
<td><strong>Procedural heuristic</strong>&lt;br&gt;Tried to sell inside the company, not with a partner</td>
<td>Learned that selling through a partner at entry led to faster sales early on&lt;br&gt;“We started shifting away from a direct sales model to an indirect model, to work through partners.”&lt;br&gt;Learnt that the firm should target both large OEMs and their manufacturing suppliers – hub and spoke model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>U.S.</strong></td>
<td></td>
<td>2</td>
<td><strong>Selection heuristic</strong>&lt;br&gt;Missed opportunities to sell to the suppliers of large multinational OEMs</td>
<td>Learned that selling through a partner at entry led to faster sales early on&lt;br&gt;“We started shifting away from a direct sales model to an indirect model, to work through partners.”&lt;br&gt;Learnt that the firm should target both large OEMs and their manufacturing suppliers – hub and spoke model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Echo</strong></td>
<td><strong>Selection heuristics</strong>&lt;br&gt;• Restrict internationalization to Asia&lt;br&gt;• Target government and financial institutions&lt;br&gt;• Sell 24x7 security service monitoring</td>
<td>“Look at who cherishes the information more. If we talk to small solo enterprises they don’t even bother, but banks and government care…that one we predicted would happen and it happened.”&lt;br&gt;“That’s why when we go in, we must find a partner…We must have a local partner to work with us.”</td>
<td><strong>Country</strong></td>
<td><strong>#</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Procedural heuristics</strong>&lt;br&gt;• Use joint venture partnerships with large mature local firms&lt;br&gt;• Target the IT group within organizations to get sales&lt;br&gt;• Focus on features selling</td>
<td><strong>Country</strong></td>
<td><strong>#</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Country</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
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</tr>
<tr>
<td></td>
<td><strong>Country</strong></td>
<td><strong>Error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td><strong>Adjustment to starting heuristics based on error</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hong Kong</strong></td>
<td></td>
<td>1</td>
<td><strong>Procedural heuristic</strong>&lt;br&gt;Targeted the IT groups within customer organizations to get sales instead of targeting the audit groups</td>
<td>Realized that responsibility for IT security was moving from IT to audit departments&lt;br&gt;“There are a lot of organizations, including banks, which have transitioned from info-security under IT to info-security under the audit group…so we changed.”&lt;br&gt;Learnt that customers were interested in consultative selling that focused on their problems, not in the features of technology&lt;br&gt;“It is more consultative selling, meaning that it is not ‘hey this is a very good technology and I can analyze the log for you.’ I am looking at it more from the risk management angle.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>Country</td>
<td>#</td>
<td>Later heuristics</td>
<td>Quotes</td>
<td></td>
<td></td>
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<td>---------</td>
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<td></td>
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</tr>
<tr>
<td>Crest</td>
<td>U.S.</td>
<td>2</td>
<td>Priority heuristic</td>
<td>“We believe that pharma is global, and U.S. driven. So we need to U.S. driven...”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.S.</td>
<td>2</td>
<td>Priority heuristic</td>
<td>“First you need to get a couple of small deals because you need to provide local references...then go out and get one of the big guys.”</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Germany</td>
<td>4</td>
<td>Temporal heuristic (sequence and pacing)</td>
<td>“The next one would be Japan.”</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Top 20 pharma reference accounts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alta</td>
<td>Norway</td>
<td>2</td>
<td>Temporal heuristic (synchronization)</td>
<td>“Finland is about two-three years ahead of Sweden in the development of retail industry, and Norway is two-three years behind Sweden.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>France</td>
<td>3</td>
<td>Priority heuristic</td>
<td>“We take one continent at a time... If the U.S. is going as planned, then we start in China. If it comes slower, then China comes later.”</td>
<td></td>
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<tr>
<td></td>
<td>Germany</td>
<td>4</td>
<td>Temporal heuristic (pacing and sequence)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Take one continent at a time (i.e., build up Europe, move to U.S., then China)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>U.S.</td>
<td>6</td>
<td>Priority heuristic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Direct sales (then indirect)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Block</td>
<td>U.K.</td>
<td>2</td>
<td>Temporal heuristic (sequence)</td>
<td>“The UK was also the hub for an expected launch into France and Germany.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.K.</td>
<td>2</td>
<td>Temporal heuristic (synchronization)</td>
<td>“We felt that we should build up much more serious bench strength in the U.K. first before moving to France.”</td>
<td></td>
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<tr>
<td></td>
<td>Korea</td>
<td>5</td>
<td>Priority heuristic</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Low costs serendipitous opportunities to enter new countries</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Center</td>
<td>Taiwan</td>
<td>2</td>
<td>Priority heuristic</td>
<td>“So our marketing strategy has been trying to get the credible players from the tier-two, tier-three countries...then you leverage that to get into the tier-one in Japan, Germany, and North America.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Taiwan</td>
<td>2</td>
<td>Temporal heuristic (sequence)</td>
<td>“It would be much tougher to get into Japanese handset providers in the short-term... we are going to start with automotive.”</td>
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</tr>
<tr>
<td></td>
<td>Korea</td>
<td>3</td>
<td>Temporal heuristic (sequence)</td>
<td>“Germany is between Korea and Taiwan, and Japan in terms of rigorousness. After talking with the Japanese...they move a little quicker in Germany.”</td>
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<tr>
<td></td>
<td>Japan</td>
<td>4</td>
<td>Temporal heuristic (sequence)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td>5</td>
<td>Temporal heuristic (synchronization)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Synchronize sales approach to local culture</td>
<td></td>
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</tr>
<tr>
<td>Grand</td>
<td>Taiwan</td>
<td>1</td>
<td>Priority heuristic</td>
<td>“We’ve always been eying the Japan market.”</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>U.S.</td>
<td>2</td>
<td>Temporal heuristic (synchronization)</td>
<td>“The U.S. is a great stepping stone for us.”</td>
<td></td>
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<tr>
<td></td>
<td>U.S.</td>
<td>2</td>
<td>Temporal heuristic (sequence)</td>
<td>“The Japanese buyers won’t buy unless the American buyer’s buy. There’s this whole pecking order of nations.”</td>
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</tr>
<tr>
<td></td>
<td>Malaysia</td>
<td>3</td>
<td>Temporal heuristic (sequence)</td>
<td>“We use a partner initially... then we will go in there and service customers directly.”</td>
<td></td>
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<tr>
<td></td>
<td>Malaysia</td>
<td>3</td>
<td>Temporal heuristic (sequence)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sell through partners first, and then build a direct channel</td>
<td></td>
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</tr>
<tr>
<td>Echo</td>
<td>Hong Kong</td>
<td>1</td>
<td>Temporal heuristic (sequence)</td>
<td>“China is the market that you just cannot ignore.”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>3</td>
<td>Temporal heuristic (synchronization)</td>
<td>“Hong Kong is the stepping stone into China and Taiwan.”</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>China</td>
<td>4</td>
<td>Temporal heuristic (sequence)</td>
<td>“Start in one country, make it work, and then replicate”</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Enter one country at a time</td>
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</table>
Table 4: Simplification Cycling

<table>
<thead>
<tr>
<th>Company</th>
<th>Prior</th>
<th>Country 1</th>
<th>Country 2</th>
<th>Country 3</th>
<th>Country 4</th>
<th>Country 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest</td>
<td>4</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Alta</td>
<td>5</td>
<td>7</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Block</td>
<td>5</td>
<td>7</td>
<td>10</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Center</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Grand</td>
<td>5</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Echo</td>
<td>6</td>
<td>12</td>
<td>14</td>
<td>13</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>
### Table 5: Varying Abstraction

<table>
<thead>
<tr>
<th>Company</th>
<th>Country</th>
<th>#</th>
<th>Increased variance in heuristic abstraction</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crest</td>
<td>U.S.</td>
<td>2</td>
<td><strong>Lower abstraction of selection heuristic</strong>&lt;br&gt;From all pharma to top 20 pharma customers&lt;br&gt;Raise abstraction of procedural heuristic&lt;br&gt;From hire local salespeople based on online resources to hire strong locals&lt;br&gt;Lower abstraction of procedural heuristic&lt;br&gt;From utilization of multiple sales approaches (e.g., direct mailing, email shots, trade events) to focusing on speaking to customers directly&lt;br&gt;Raise abstraction of selection heuristic&lt;br&gt;From focus on being a provider of electrical based diaries to becoming the leader in integrated data collection</td>
<td>• Focused efforts on biggest and most likely potential customers&lt;br&gt;• Gave flexibility in how to hire the best local talent – e.g., board member contacts in the U.S., headhunters in Germany&lt;br&gt;• Provided a more efficient method for gathering local customer feedback about products&lt;br&gt;• Created greater attention on larger opportunities that centered around clinical trials</td>
</tr>
<tr>
<td></td>
<td>U.S.</td>
<td>2</td>
<td>Raise abstraction of procedural heuristic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.S.</td>
<td>2</td>
<td>Lower abstraction of procedural heuristic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Germany</td>
<td>4</td>
<td>Raise abstraction of selection heuristic</td>
<td></td>
</tr>
<tr>
<td>Alta</td>
<td>Norway</td>
<td>2</td>
<td><strong>Raise abstraction of selection heuristic</strong>&lt;br&gt;From original focus on Scandinavian retail customers to a broader focus on large retail customers&lt;br&gt;Lower abstraction of selection heuristic&lt;br&gt;From focus on large retail customers to a more targeted focus on grocery customers</td>
<td>• Let organization pursue larger customer deals&lt;br&gt;• Focused efforts on segment where company had superior experience and weak competition</td>
</tr>
<tr>
<td></td>
<td>U.S.</td>
<td>6</td>
<td>Raise abstraction of selection heuristic</td>
<td></td>
</tr>
<tr>
<td>Block</td>
<td>Korea</td>
<td>5</td>
<td><strong>Raise abstraction of selection heuristic</strong>&lt;br&gt;From original country target of “English speaking markets” to low cost opportunities to generate revenue&lt;br&gt;Raise abstraction of procedural heuristic&lt;br&gt;From strict corporate control of all country entries to on and off-balance sheet deals</td>
<td>• Enabled pursuit of serendipitous revenue opportunities with distributors in countries without large capital outlay&lt;br&gt;• Provided greater options for structuring country entry depending on corporate resources</td>
</tr>
<tr>
<td></td>
<td>Korea</td>
<td>5</td>
<td>Raise abstraction of procedural heuristic</td>
<td></td>
</tr>
<tr>
<td>Center</td>
<td>Taiwan</td>
<td>2</td>
<td><strong>Raise abstraction of procedural heuristic</strong>&lt;br&gt;From original sales approach emphasizing cost to sales approach clarifying value proposition&lt;br&gt;Raise abstraction of selection heuristic&lt;br&gt;From focus on being a chip company to a focus on being a systems solutions company (hardware and software)&lt;br&gt;Raise abstraction of selection heuristic&lt;br&gt;From PDAs, cell phones, and automotive GPS to mobile device that was least competitive in country</td>
<td>• Allowed managers to flexibly emphasize value proposition that would be most important for customers in local market (e.g., features, time to market)&lt;br&gt;• Could address broader range of demands for mobile solutions across countries and also provide a “total solution”&lt;br&gt;• Created flexibility to quickly enter un-entrenched market niches</td>
</tr>
<tr>
<td></td>
<td>Taiwan</td>
<td>2</td>
<td>Raise abstraction of procedural heuristic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>4</td>
<td>Raise abstraction of selection heuristic</td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>Country</td>
<td>#</td>
<td>Increased variance in heuristic abstraction</td>
<td>Rationale</td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>---</td>
<td>---------------------------------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Grand</td>
<td>Taiwan</td>
<td>1</td>
<td><strong>Lower abstraction of selection heuristic</strong>&lt;br&gt;From an original country focus on Asian countries to the more concrete category of Rosetta Net countries</td>
<td>• Added legitimacy to young firm through direct association with standards body</td>
</tr>
<tr>
<td></td>
<td>U.S.</td>
<td>2</td>
<td><strong>Raise abstraction of procedural heuristic</strong>&lt;br&gt;From few specific contractual arrangements with partners to a broader repertoire of arrangements</td>
<td>• Created opportunities to work with U.S. firms in range of unique partnership arrangements</td>
</tr>
<tr>
<td></td>
<td>Malaysia</td>
<td>3</td>
<td><strong>Raise abstraction of selection heuristic</strong>&lt;br&gt;From focus on Rosetta Net standard to focus on standards in general</td>
<td>• Allowed firm to reduce dependency on one particular standard, but still use standards to enter new growth markets</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>5</td>
<td><strong>Raise abstraction of procedural heuristic</strong>&lt;br&gt;From the formation of local partnerships to enter a local country to the consideration of local or non-local partnerships to enter</td>
<td>• Let management avoid bureaucracies of partnering with local firms in China and create alliances with non-Chinese firms who had had success in the country</td>
</tr>
<tr>
<td>Echo</td>
<td>Hong Kong</td>
<td>1</td>
<td><strong>Lower abstraction of selection heuristic</strong>&lt;br&gt;Focus on China</td>
<td>• Focused firm on large emerging market</td>
</tr>
<tr>
<td></td>
<td>Malaysia</td>
<td>2</td>
<td><strong>Raise abstraction of selection heuristic</strong>&lt;br&gt;From original focus on government and banks to large organizations with proprietary information and ability to pay</td>
<td>• Allowed autonomy to pursue different customers for whom the company’s security products provided key value</td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>3</td>
<td><strong>Raise abstraction of selection heuristic</strong>&lt;br&gt;From joint venture partnerships with large mature local firms based on personal relationships and reputation for reliability to partnerships based on unique business environment</td>
<td>• Enabled flexibility in partnering – e.g., to gain an exclusive franchise partner in Japan and multiple rep partners with strong personal relationships in various sectors in China</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>4</td>
<td><strong>Raise abstraction of selection heuristic</strong>&lt;br&gt;From “sell 24x7 security monitoring” to “sell security services”</td>
<td>• Allowed exploitation of a range of opportunities based on country infrastructure and local customer needs</td>
</tr>
</tbody>
</table>
Table 6: Learning a Process from Experience

<table>
<thead>
<tr>
<th></th>
<th>Behavioral emphasis on routines</th>
<th>Cognitive emphasis on heuristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nature</strong></td>
<td>• Unspecified types of patterned actions</td>
<td>• Specific heuristics of particular types that combine best practice with firm specific uniqueness</td>
</tr>
<tr>
<td><strong>Focus</strong></td>
<td>• Repeated task execution where the goal is often variance reduction</td>
<td>• Novel opportunity capture where the goal is generally variance creation</td>
</tr>
<tr>
<td><strong>Evolution of learned content</strong></td>
<td>• Unclear what is learned first and what is learned next</td>
<td>• Selection and procedural heuristics developed sooner and timing and priority heuristics developed later</td>
</tr>
<tr>
<td></td>
<td>• Number of routines becomes more elaborated and complex over time in order to improve robustness and efficiency</td>
<td>• Number of heuristics becomes more elaborated and then simpler in number over time in order to balance adaptation and efficiency</td>
</tr>
<tr>
<td></td>
<td>• No attention to abstraction</td>
<td>• Increased variance in abstraction so as to maintain some coherence and stability but also allow for plasticity needed for increased heterogeneity</td>
</tr>
<tr>
<td></td>
<td>• Becomes more rote and taken-for-granted as organizations begin to repeat similar behaviors (e.g., acquisitions in the same industry, alliances with previous partner, or entries into same cultural block of countries)</td>
<td>• Becomes more mindful and less taken-for-granted as varied experience increases and organizational members internalize and make sense out of diversity</td>
</tr>
<tr>
<td><strong>Key learning mechanisms</strong></td>
<td>• Primarily “learning by doing”</td>
<td>• Interplay of trial-and-error with foresight</td>
</tr>
<tr>
<td></td>
<td>• Post hoc codification</td>
<td>• Real time improvisation</td>
</tr>
<tr>
<td><strong>Appropriateness</strong></td>
<td>• More stable and predictable environments</td>
<td>• More dynamic and unpredictable environments</td>
</tr>
</tbody>
</table>
Endnotes

i Some readers may question the consistency of findings across all six cases. But the observance of common patterns across all cases is not only appropriate but expected in well-executed case-based research (Eisenhardt, 1989; Yin, 1994). Indeed, it is the search for common patterns that lies at the crux of theory building from multiple cases. Therefore, while consistency of data supporting theory may be viewed as surprising from the perspective of traditional theory testing research, it should generally be viewed as unsurprising and anticipated in theory building from multiple cases.

ii Although some learning is tacit and therefore not able to be articulated, we focus primarily on that learning which informants are able to articulate because that is the learning that we could assess. However, we also think this type of learning is as or even more relevant to organizations than tacit knowledge because it is more readily transferred among people and reflects greater effort to understand the causal links between actions and outcomes needed for learning a process from experience.

iii We define country entry in terms of sales operations (see definition in Methods section). Thus, although Center created R&D operations in Taiwan, and manufacturing operations in China, they did not “enter a country” until they entered China (first entry) in order to gain sales.

iv A key point is that these heuristic types are general, and so apply to other organizational processes. For example, selection heuristics in acquisitions focus on, for example, specifying target companies (e.g., Cisco’s well-known heuristic to acquire ventures about to launch their first product). Similarly, procedural and temporal heuristics in product development might focus on, for example, specifying project leadership (e.g., Toyota’s well-known heuristic to use heavyweight project managers) and rate of product introduction (e.g., Pixar’s heuristic to create a new feature-length movie every year), respectively.

v For example, the founders of Echo were 47 and 45 and had significant international experience (five and eight years respectively). In contrast, the three entrepreneurs who founded Crest were each was about 25 years old, and had little industry or international experience. To illustrate, one had spent a year at McKinsey and a year doing academic research, while another had spent several months working for local pharmaceutical companies. As one confessed, “I didn’t have any relevant business experience.”

vi To illustrate, the CEO of Alta was about 55 and had extensive domestic experience (about 30 years) but only one year of international experience. As his remarks about the founding team illustrate, “We didn’t know much about the international business.” In contrast, the CEO of Block was 45, had over 10 years of international experience and was described by his co-founder as “Mr. International”.

vii Cultural distance from HQ calculated using measures from Hofstede (2001) and Kogut and Singh (1988).

viii TMT and country level