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Formal integration archetypes in ambidextrous organizations

ABSTRACT

Research suggests that organizational ambidexterity, an organization's capacity to pursue both exploratory and exploitative activities, is critical to firm innovation and performance. Extant research primarily emphasizes several firm-level informal integration mechanisms, such as creating a common vision and relying on social integration, for integrating structurally ambidextrous units. Research has largely ignored, however, the formal mechanisms by which organizations have integrated such units.

In this inductive study, using archival and interview data from organizations in Silicon Valley, we address this gap by identifying the formal integration archetypes that enable core business units to collaborate with new venture units to incubate new businesses. The four integration archetypes that enable collaboration vary along two key dimensions: who initiates new ventures and when collaboration is solicited. We identify formal administrative and resource mechanisms that enable such collaboration. We combine the disparate literatures of temporal and spatial separation of ambidextrous structures, and demonstrate how these must be combined at the business unit and new venture levels of analysis to achieve integration. The practical contribution of this study lies in identifying suitable contexts in which each of these archetypes can be utilized by practitioners for reintegrating new venture projects developed in separate structures.

1. Introduction

Most large organizations face the challenge of creating and sustaining new ventures while simultaneously managing and growing their existing core businesses. Research suggests that ambidextrous structures—those that enable organizations to simultaneously exploit current capabilities while exploring new ones—are key to meeting this challenge (O'Reilly and Tushman, 2007; Raisch, Birkinshaw, Probst, and Tushman, 2009; Smith and Tushman, 2005; Tushman and O'Reilly, 1996). These organizations are likely to increase their growth, return on investment and market share (Han and Celly, 2008; He and Wong, 2004; Simsek, Heavey, Veiga, and Souder, 2009).

Despite the increasing interest in and potential benefits of ambidextrous structures, studies that explore how organizations can maintain this crucial balance between separation and integration of core and new businesses are relatively rare and fragmented (Durisin and Todorova, 2012; Gassmann, Widenmayer, and Zeschky, 2012; Heller, 1999; Leifer, McDermott, O'Connor, Peter, Rice, and Veryzer, 2000). Research exploring mechanisms for integrating ambidextrous structures has addressed this issue from a broad firm-level perspective (for a notable exception, see Gassmann et al., 2012). Such research explores this issue from the corporate level perspective, focusing primarily on facets such as shared vision, senior management team coordination, and cross-functional interfaces that enable knowledge sharing (Burgers, Jansen, Van Den Bosch, Frans, and Volberda, 2009; O'Reilly and Tushman, 2007; Smith and Tushman, 2005; Simsek et al., 2009; Tiwana, 2008).

Existing research does not explain, however, the processes and steps through which new venture units and core business units collaborate on new venture projects. In other words, current discussions on integration of ambidextrous structures have only outlined a general picture of

what elements the integration process entails. They do not tell us the operational nuances of *how* and *when* business units and new venture units integrate with existing core units to develop new businesses. Focusing on the *how and when* is critical because possessing such integration processes are not trivial capabilities. Strategic ambidexterity is a critical capability (Han and Celly, 2008; O'Reilly and Tushman, 2007). Organizations that grasp the processes for achieving ambidexterity are likely to succeed in developing new businesses (Han and Celly, 2008). Indeed, scholars have begun to call for research addressing the integration process more concretely. For example, Durisin and Todorova (2012) argue that “the stress on structural and cultural separation and managing reintegration should shift from what activities to reintegrate to when and how to reintegrate them” (p. 71). In this paper, we respond to this call and explain the processes through which organizations can reintegrate new ventures into their core businesses.

Theoretically, we situate our study as an extension of Gassmann et al.'s (2012) insightful work that addresses the *how* of new venture integration. Gassmann et al. (2012) identify informal mechanisms, at the new venture unit and the core business unit level, mostly based on willingness of participating entities to work together, through which new ventures integrate innovations into core business units. These mechanisms include gaining external validation, innovation showcasing, liaison channeling, network building, and collaborative decision making. Their study identifies the informal mechanisms needed to integrate new ventures with core business units. Missing from their discussion, however, is an understanding of the formal administrative mechanisms that propel such integration. How do organizations, for example, connect the vested interests and formal responsibilities of these structurally separated organizational entities? What is the role of funding or project ownership in determining

collaboration? Effective collaboration between business and new venture units might be difficult in the absence of formal mechanisms that create linked organizational interests.

To fill this gap, our research specifically focuses on the formal integration mechanisms through which new venture units and core business units of leading global organizations collaborate to develop emerging businesses. We identify the actors who initiate the new venture, the responsibilities of the actors, the timeline of the integration, and the contextual conditions under which a particular type of integration might be appropriate. We explore processes and practices by which business units and new venture units work together to create and develop new businesses. Thus the research questions explored in our study are: How and when must new venture and business units collaborate to incubate new businesses? What are the formal integrating mechanisms by which new venture units and business units effectively collaborate to develop new businesses?

We conducted an inductive study using the multiple case research design (Eisenhardt, 1989; Yin, 2009). We used archival and interview data from organizations based primarily in Silicon Valley's high-technology industry. Results of our study indicate that new venture units collaborate with business units through four formal integration archetypes. These four integration archetypes vary along two key dimensions: who initiates new ventures and the point when collaboration is solicited. We also explicitly identify the formal administrative and resource mechanisms that enable collaboration for these different archetypes.

The theoretical contribution of this study lies in identifying the formal integration mechanisms at the new venture and core business unit level through which new projects are integrated into core business units. Additionally, we combine the disparate literatures on temporal and spatial separation of ambidextrous structures (Raisch, 2008) to show how both are

combined at the new venture and core business unit level for integration. Our study's practical contribution lies in identifying suitable contexts and projects in which each of these archetypes can be utilized by practitioners for integrating new venture projects developed in separate structures. For each of these archetypes, moreover, we also suggest formal resource and administrative means that practitioners can leverage for successful integration.

2. Literature Review

The theoretical tension between integration and separation dominates the literature on organizational ambidexterity (Jansen, Tempelaar, Van Den Bosch, and Volberda, 2009; O'Reilly and Tushman, 2004; Tushman and Smith, 2002). The literature provides several theoretical perspectives through which organizations can achieve balanced ambidextrous structures. Despite these perspectives, we know very little about how organizations practically deploy solutions to reintegrate structures (Gassmann et al., 2012; Raisch, 2008; Siggelkow and Levinthal, 2003). In this section, we review the literature on the different routes through which organizations achieve ambidexterity and address the processes through which reintegration is achieved. We identify the gaps in literature and elaborate upon how our study addresses these gaps.

2.1. Structural separation to achieve organizational ambidexterity

Previous research has suggested that organizations need to be ambidextrous to pursue the often-contradictory goals of exploitation and exploration (Duncan, 1976; Gibson and Birkinshaw, 2004; He and Wong, 2004; Levinthal and March, 1993; O'Reilly and Tushman, 2004; Tushman, Anderson, and O'Reilly, 1997). Firms achieve ambidexterity through different routes: temporal separation, spatial separation, and parallel structures (Raisch, 2008; Raisch and Birkinshaw, 2008). Temporal separation refers to a model in which organizations alternate between periods of decentralization to emphasize innovations and periods of centralization to enhance cost

efficiencies (Raisch, 2008). Thus exploration and exploitation are emphasized sequentially rather than simultaneously (Gupta, Smith, and Shalley, 2006; Raisch, 2008). Scholars have also suggested that overall decentralization at one temporal phase with subsequent reintegration in the next yields the highest organizational performance (Siggelkow and Levinthal, 2003). From a process perspective, temporal separation leads to changes in formal structures, routines, and systems. Developing process mechanisms and interpersonal relationships that enable this vital switch between exploration and exploitation is critical (Wang and Rafiq, 2012).

In the next route to achieving ambidexterity, organizations create spatial separation, also referred to as structural separation (Raisch and Birkinshaw, 2008), at the business unit or corporate level. When opting for this route, organizations use separate units for exploration and exploitation, where each activity is managed in its unique way (Benner and Tushman, 2003; Duncan, 1976; Gibson and Birkenshaw, 2004; McDonough and Leifer, 1983; Raisch and Birkinshaw, 2008; Raisch et al., 2009; Tushman and O'Reilly, 1996). In spatial separation, organizations partition themselves into separate structures for handling routine and non-routine (Adler, Goldoftas, and Levine, 1999; Jansen et al., 2009; Kortmann, 2012). This spatial separation creates boundaries through which radically innovative exploratory activities and incrementally innovative exploitation activities are physically dispersed from one another (Benner and Tushman, 2003). The architecture for exploitation emphasizes highly structured roles and responsibilities, centralized procedures, and a focus on efficiency (Nadler and Tushman, 1996). In contrast, organizational architectures for exploration are based on decentralized structures, loose work processes, and a focus on experimentation (Tushman et al., 1997). Spatial separation insulates exploratory units from inertia existing in the parent organization and allows

the organization to achieve exploration and exploitation simultaneously (Gilbert, 2005; Jansen et al., 2009).

The final route to achieving ambidexterity involves parallel structures. Here organizations use primary and secondary structures to carry out key tasks (Raisch and Birkinshaw, 2008). An organization's primary structure is used for incremental innovation and for maintaining stability, while secondary structures such as project teams and networks are geared toward exploratory activities (Adler et al., 1999; Raisch and Birkinshaw, 2008). The logic of parallel structures is that work units perform different kinds of tasks and deal with different task environments and, thus, that separation enables each unit to focus on its tasks more effectively (McDonough and Leifer, 1983). Thus, while temporal separation is time related, both structural separation and parallel structures relate to spatial separation.

2.2. Integration of ambidextrous structures

Although scholars have emphasized the creation of separate organizational units to focus on exploration and innovation, the next key question is how do units that are separated achieve integration? Integration is important because structurally separated units are unable to share knowledge and resources with mainstream units (Burgers et al., 2009). New venture units possess knowledge and capabilities for identifying and incubating new business opportunities. In addition, they face fewer constraints as compared to established business units. On the other hand, most new venture units do not control the core resources or possess the necessary infrastructure to transform an early-stage venture project into an established viable business. These resources and capabilities normally reside with core business units (O'Reilly and Tushman, 2004). Thus, even though organizations establish separate structures, it is important to have organizational processes to tie these different units together. Recent research suggests that

effective integration is critical for ensuring sustained growth (Durisin and Todorova, 2012).

Organizations do not reap the full benefits of new ventures, unless these are successfully integrated.

Yet many organizations face great challenges in integrating innovations developed in new venture units with their core business units. For example, O'Connor and Maslyn (2004) describe the Business Venture Group (BVG), a new venture unit created by Nortel Networks in the late 1990s. Nortel's initial intention was to graduate 80% of their new venture projects internally to Nortel's existing businesses and spin-out the remaining 20% of the projects. But in a surprising turn of events, only 20% of the new venture projects were accepted by and folded back into core business units. Similarly, Intel's New Business Initiative (NBI) group (Intel's corporate new venture unit) had 48 venture projects in 2007. Of these, 14 grew and were folded back to the core business units. Eleven of the 14, however, were shut down shortly after being folded back. Executives at NBI admitted that such survival rates were poor (Shih and Thurston, 2008).

In contrast, the Emerging Business Opportunity (EBO) program (IBM's famous corporate incubation initiative) proved to be a phenomenal success (O'Reilly, Harreld, and Tushman, 2009). From 2000 to 2008, IBM's EBO program launched a total of 25 EBO initiatives. Among these, three have failed, and the remaining 22 have produced more than 15% of the revenues for the company (O'Reilly et al., 2009). Indeed, four of the seven initiatives launched with the EBO in 2000 have graduated successfully and become growth businesses. Thus successfully reintegrating ambidextrous structures is a key practical challenge for organizational managers, in addition to being a tenacious research issue.

What are the mechanisms through which these ambidextrous organizations integrate? Organizational theory points to two: formal and informal mechanisms. Formal integration

mechanisms include departmentalization; centralization or decentralization; formalization and standardization; planning such as strategic planning; and control such as financial performance and technical reports (Galbraith, 1973; Lawrence and Lorsch, 1967; March and Simon, 1958; Martinez and Jarillo, 1989; Ouchi, 1977). Informal mechanisms include lateral or cross-departmental relations such as direct managerial contacts, temporary teams, integrating roles, integrative departments; informal communication such as personal contacts among managers; and socialization techniques such as inculcating organizational culture and values through training and reward systems (Galbraith, 1973; Lawrence and Lorsch, 1967; March and Simon, 1958; Martinez and Jarillo, 1989, Ouchi, 1977).

Few studies have addressed these mechanisms to explain the integration of separated units (Durisin and Todorova, 2012). Studies that analyze this issue underscore primarily informal mechanisms at the level of the corporation and top management. Focusing at that level of analysis, Burgers et al. (2009) identify cross-functional interfaces, top management team's contingency rewards, shared organizational vision, and top management team's social embeddedness as key to integration. Similarly, O'Reilly and Tushman (2004) suggest senior management team integration, common vision and values, and senior-team rewards as central to integrating ambidextrous units.

In contrast to these corporate level perspectives, a notable study by Gassmann et al. (2012) focuses on how innovations are integrated at the level of the business unit and the new venture unit. Drawing on informal mechanisms identified in theory such as socialization strategies, lateral or cross-departmental relations, and informal communications (Galbraith, 1973; Lawrence and Lorsch, 1967; Martinez and Jarillo, 1989), Gassmann et al. (2012) identify four key

integration strategies: seeking external validation, innovation showcasing, liaison building, network channeling, and collaborative decision making (Gassmann et al., 2012).

New venture units, for example, use legitimation strategies—external validation from prominent customers and innovation showcasing within their organization—to gain acceptance for their innovation and reintegrate it into the organization. When adopting these strategies, new venture units draw on the socialization aspect of informal structures. They understand their organization’s culture and norms regarding innovation and, based on this understanding, position their new venture in such a way that it gains legitimacy within their organization. As a result of this process, organizations accept the innovation and integrate it.

The other strategies described by Gassmann et al. (2012)—liaison channeling, network building, and collaborative decision making—rely heavily on two prominent informal mechanisms, lateral or cross-departmental relations and informal communication (Galbraith, 1973; Lawrence and Lorsch, 1967; Simon, 1976; Martinez and Jarillo, 1989). In liaison channeling, radical innovation units position innovation champions as boundary spanners in operational businesses. In turn, these champions form linking pins to decision makers within the entire company. This helps managers in the operational mainstream units bypass the “not-invented-here” syndrome and helps new venture units gain adoption for their innovation (Gassmann et al., 2012). In network building, senior- and middle-level managers in the operational and mainstream business units directly communicate, exchange information, and form personal linkages. Both liaison channeling and network building enable the creation of social ties, which in turn become conducive for radical innovation to spread through word of mouth.

Lastly, collaborative decision making entails the use of integrative innovation planning. When using integrative innovation planning new venture units involve business units into radical innovation research at early ventures stages. This enables new venture units to impart a sense of ownership to the business units for these new projects. This early involvement enables business units to accept radical innovations with lesser resistance than if they had become involved at later stages. Thus Gassmann et al. (2012) have identified informal mechanisms that enable new venture units utilize to seamlessly integrate with the core business units.

3. Methodology

In contrast to Gassmann et al.'s (2012) focus on informal mechanisms the purpose of this research is to discern the *formal* integration mechanisms by which business units and new venture units effectively collaborate to launch new businesses. We used a multiple case research design to explore these issues. Case studies are typically used for theoretical questions that deal with real management situations (Gibbert, Ruigrock and Wicki, 2008), or explore new theoretical arguments to explain process-level phenomena (Gillham, 2000, Yin, 2009). Due to the complexity and process nature of our research question, combined with the sparse knowledge on this issue, we chose a multiple case research design (Eisenhardt, 1989; Yin, 2009). We also used multiple case studies because these are considered more robust than a single case study design (Gillham, 2000, Yin, 2009). Comparisons across cases allow researchers to validate their findings, identify common theoretical mechanisms in different contexts, and increase the validity of their research findings (Yin, 2009).

3.1. Sample Selection

We followed several criteria when selecting our sample and used a theoretical sampling approach to choose organizations in which our phenomenon of interest is best observed

(Eisenhardt, 1989). First, we mainly focused on organizations operating in San Francisco's Silicon Valley area. Silicon Valley has a vibrant innovation culture and many organizations try and experiment with cutting-edge innovations (Saxenian, 1994; Saxenian, 2002). This provides ample opportunities to identify innovative organizations to study. We included some organizations not headquartered in Silicon Valley, if they had an active innovation program.

Second, we identified organizations that had active new business development programs at the corporate level, in addition to well-established organizational processes to manage innovation projects. Such organizations allow us to analyze the organizational process of managing corporate innovation rather than the outcome of the innovation programs per se, such as new products or technologies. Third, we sought product innovation focused organizations rather than service organizations. Service organizations differ from product organizations due to specific characteristics such as intangibility, co-production with customers, perishability, and other such features (Djellal and Gallouj, 2001; Fitzsimmons and Fitzsimmons, 2000; Nijssen, Hillebrand, Vermuelen, and Kemp, 2006), which in turn leads to different organizational processes (Nijssen et al., 2006). Taking these variations into consideration, we focused mainly on product-related innovation process. We were able to identify these organizations based on case studies, articles, and informal interactions with executives from various organizations.

We approached these organizations through our direct and indirect network relationships. Nine organizations provided us research access. The names of these organizations are not reported due to our confidentiality agreements with them. In Table 1, we list detailed information about the organizations and their new business venture units. These nine organizations come from a variety of industries, including IT hardware, software, document management, hearing aids, personal electronics, etc.

INSERT TABLE 1 HERE

3.2. Data collection

The data for our study come from three different sources. The first is archival data, including published case studies about the organization, media articles, and publications such as annual reports, websites, and public presentations by company executives. These materials revealed a wide range of information about the organizations in our study. These archival data enabled us to gain a deep understanding of the new venture activities within these organizations.

Our second source of data comes from interviews with company executives. We used the following criteria to select executives for interviews. First, the executives had to have been involved in managing new business development. Their firsthand knowledge of new venture business increases the validity of the interview data. Second, we targeted executives at both corporate and business unit levels. Since our research touches on the innovation management process that relates to both levels, having both perspectives allowed us to avoid potential bias and increase the validity of our interview data.

We interviewed multiple executives in each organization, including senior vice presidents, vice presidents, general managers, senior directors, and directors. These individuals were directly involved in new business development. We also interviewed some executives multiple times to further clarify certain issues that were unclear in the first interview. Each interview typically lasted between one to two hours. Following Eisenhardt (1989), we used semi-structured interviews to minimize “pre-conceived” notions in data collection. We started with open-ended questions that allowed for discussions relating to our question of interest. We recorded and transcribed many of the interviews. For the remaining interviews, in which the participants did

not want to be recorded, we took extensive notes during the interview and wrote summaries immediately after. These recordings and interview summaries allowed the authors and assistants to reliably review the interview data to identify key issues, solutions, and patterns pertaining to our research objectives.

The two data sources (i.e., published materials and interviews) are complementary. In some cases, the published materials provided background information and an overall context to better understand the company's innovation activities. In other organizations, the published materials provided information on specific innovation programs, which helped us to develop focused interview questions. The interview questions were focused on understanding these organizations' progress in managing its corporate innovation programs. Table 2 explains how we triangulated data from different sources.

INSERT TABLE 2 HERE

In addition to our analysis of published materials and extensive interviews with these nine organizations, we also attended meetings of a professional group on corporate venturing and spoke with other relevant actors in the industry to verify our findings. These meetings and the follow-up interviews helped our data analysis in two ways. First, the author shared with the group members or interview subjects some anecdotes and observations from our preliminary analyses of the nine organizations. Members of the professional group would comment on these observations and phenomena from their own organization's perspectives. This type of peer and expert debriefing enabled us to deepen our understanding of the phenomena that we observed from our interviews. Second, group members discussed the innovation management processes in general, as well as the specific issues they encountered and solutions they generated. This

information helped us view the integration activities we observed in our sample from a new perspective. In short, the group meetings and follow-up interviews assisted us in verifying patterns and themes that we observed from the data we had already collected.

In total, we conducted 37 interviews with 24 executives from the nine organizations. By adding additional interviews from the 14 organizations through our contacts at the professional group, we conducted a total of 51 detailed interviews with 38 executives for this study.

3.3. Data analysis

To identify patterns in our data, we analyzed the specific activities for collaboration and related issues each company encountered when managing the cooperation between corporate and business units in developing new business. We then summarized the key characteristics of these phenomena. We triangulated our data by including different data sources of the same case, that is, multiple interviews, group meeting notes, and archival data (Yin, 2009).

We first used within-case data analysis (Eisenhardt, 1989) to find the formal mechanisms through which organizations managed core business units and new venture unit interactions. We then engaged in cross-case patterns to identify within-group similarities and intergroup differences (Eisenhardt, 1989). The objective was to find new patterns used by organizations to manage the processes between business units and new venture units when creating and integrating new businesses. To delineate the formal mechanisms behind these processes, we focused on specific, measurable, and observable rules and responsibilities rather than on vague opinions. For example, we emphasized statements such as “as a policy, [X] business unit is responsible for 50% of the total project budget” or “the corporate incubator is responsible for initiating, setting up, and funding project teams.” In contrast we de-emphasized statements such as “the business unit has high stake in the project” or “the corporate incubator is deeply involved

in the initial incubation process.” This process allowed us to identify and validate different patterns and arrive at the integration archetypes adopted by various organizations.

In summary, our review of cases and publications, archival data, and interviews with organizations provided multiple sources of data to arrive at our findings (Yin, 2009). At this stage, we did not gain any new insights or uncover any new patterns in the data from further interviews. This enabled us to conclude that we reached theoretical saturation (Eisenhardt, 1989; Glaser and Strauss, 1967) regarding how this process is managed.

4. Findings

As a result of analyzing the formal mechanisms by which business units and new venture units integrated new projects, we arrived at four integration mechanisms, or archetypes, that we describe below. These four integration archetypes are founded on two mechanisms; administrative accountability and resources invested in new ventures. Based on the timing and relative involvement of the business unit relative new venture units, these archetypes—initiation, and early-, mid-, and late-stage involvement—are used in various forms in different organizations. We found one structural commonality across most organizations beyond these four integration archetypes, namely advisory boards. We first discuss this structural commonality before focusing on the four integration archetypes.

With the exception of three organizations in our study (COTS, COEN, and CONI), the majority of the organizations in our sample established committees or boards consisting of executives from core business units to supervise or advise new venture activities. These committees provide advice to the venture incubator regarding the new projects that need to be focused upon. COME, a cloud-based computing business, is a case in point. Several committees, one of which consists of heads of core business units, advise its corporate new venture incubator.

Although the funding and initial incubation are supported for about six months by the corporate incubator, the incubator normally finds a business unit to sponsor or supervise each project that it is working on. The sponsoring business unit has a direct say on whether to continue the project.

In some organizations, such advisory boards are deeply involved in the details of the incubation process. Sometimes, such deep involvement causes obstacles to new venture development. For example, in 1996, Nortel established a corporate new business development organization. This organization was supervised by an advisory board, which consisted of the company's executive vice presidents from various core businesses and administrative branches (O'Connor and Maslyn, 2004). The board's main responsibility was to supervise the development of new venture projects and make funding decisions. But such deep involvement created challenges to new venture projects.

First, most of the board members were executives whose experience lay in managing large, established organizations. They therefore had a strong bottom-line mentality. They lacked the necessary knowledge and skills to properly guide and manage early-stage ventures. They were also reluctant to commit significant funds to high potential but risky projects. In addition, high turn-over among advisory board members made it difficult for the board to provide new ventures with consistent guidance and decisions. Second, when the interests of the advisory board members were tied to the interests of established business units, the board members were likely to be biased against new ventures, especially if these ventures hurt the interests of the core business units. This made it difficult for board members to provide sound guidance to new ventures (O'Connor and Maslyn, 2004).

This finding on a common advisory board involvement is congruent with the findings in literature that top management integration is key for linking ambidextrous structures (O'Reilly

and Tushman, 2007; Smith and Tushman, 2005; Simsek et al., 2009; Tiwana, 2008). In addition to top-level integration through a common advisory board, organizations develop four other distinctive integration archetypes to facilitate cooperation between core business units and new venture units in order to integrate innovation projects. These ideal types vary along two dimensions. The first is administrative ownership and accountability. This typically includes business units jointly owning and sharing the responsibilities of developing innovation projects with new venture units. Such shared responsibilities make business units motivated to work with new venture units to develop new projects.

The second dimension in facilitating integration relates to the resources that business units invest in the new venture projects and the risks and rewards associated with these projects. Such investments typically include financial and human resources. On the risk side, when business units invest in new venture projects, they face risks because of the uncertainty inherent in these projects. This is especially true when business units invest in early-stage venture projects in which the directions and outcomes of the projects are highly uncertain. Under such situations, business units are motivated to work with corporate venture units to help new venture projects minimize the risks of losing the invested resources and capabilities. On the expected return side, business units are always motivated to accept and integrate new venture projects if they believe the investment in new venture projects will result in good return and rewards to the business units. Obviously, for any given venture project, these two factors (minimizing risks and maximizing returns) are highly related. Many times, business units invest in projects with high risks due to the probability of high returns.

In the following sections, we first explain how each archetype works followed by a discussion of how each archetype uses administrative responsibility, and the risk versus reward tradeoff, to facilitate integration of new venture projects.

4.1. Integration Archetype 1: Business units initiating projects, new venture units co-incubating (early-stage)

In some organizations, business units have enough resources, power, and scale to lead their own new business development activities. However, these business units need help and support from the corporate new venture units, for example, to obtain talent and knowledge. They also require cross-business coordination for managing the incubation process. Under such circumstances, organizations let business units decide what new businesses to incubate and, at the same time, take advantage of the unique capabilities of corporate new venture units. In sum, in this integration archetype, corporate venture units do not actively initiate new projects. Rather, they use their knowledge and capabilities to help business units incubate and develop new projects.

The incubation process of CONI is a typical example of this integration archetype. The company's new venture unit collaborates with business units through a multi-step process. In the first step, the new venture unit works with liaisons from business units to solicit and identify new projects. New venture units then help business units to develop business and technology plans for these new businesses and conduct initial tests. Although most of the work at this phase is done at the site of the corporate new venture unit, business units provide suggestions and are involved in the process. The next step is the validation phase where CONI's new venture unit and business units work together on the proof of technology and business concepts, and test key elements of the business and technology plans for different projects.

As a part of this process, CONI's new venture unit works with different stakeholders at business units to ensure support for the new projects. For example, the new venture unit identifies champions at business units for each of the new businesses. The new venture unit also works closely with senior executives and business development planners of these business units to gain support. For example, the senior manager of corporate venture group indicated that:

At the validation phase, we [the new venture unit] require business units to agree on certain conditions in order to get our further funding at this phase. One of the conditions is that if we provide to a business unit certain data and info to validate the potential of a co-incubated project, the business unit will need to give us a clear decision whether or not it will include the project into its formal new business development plan.

Furthermore, the new venture unit requires business units to gradually increase their funding for the projects. For example, when a project is at the first phase, business units are expected to contribute about 25% of the total funding, while in the next phase they contribute about 50% of the total funding. Such escalation of commitment from business units ensures their buy-in and commitment. Besides CONI, several other organizations also adopted this integration archetype, including COAS, COME, and COPH. Some organizations consider helping business units co-incubate new projects to be one of the key performance indicators of their new venture units.

As we can see, the integration mechanism works along two dimensions in this archetype. On the administrative ownership and accountability dimension, the corporate new venture unit and business unit share administrative ownership and responsibility of the new venture projects. Although in early stages, the corporate new venture group takes leading roles in performing the daily tasks related to incubation, the fact that the new innovation projects are initiated and sponsored by business units make the latter share significant responsibility and ownership of the projects. On the resources risk and reward dimension, the corporate new venture unit contributes more resources initially. But such resource contribution by the corporate new venture unit is

contingent upon business units increasing their resource contributions when the projects meet certain milestones. This rule applies even when projects are in early stages and still risky, thus making business units share more of the risk if the projects fail. Such a risk of losing sunk resources invested in the projects motivates business units to accept and continue supporting new ventures.

A key advantage of this integration archetype is that business units can leverage the new business development competencies of corporate new venture units. Such benefits are especially important for core business units that have limited capability of developing new business. The disadvantage of this integration archetype is that it favors short-term new venture projects and misses promising innovation opportunities. This is because business units typically tend to ignore opportunities that are not directly related to their immediate business domain, despite possibilities of high returns.

4.2. Integration Archetype 2: New venture units initiating new projects, involving business units early on (early-stage)

In some organizations, business units lack the capabilities to take an active role in initiating new business projects and need assistance in developing new businesses. In others, corporate headquarters might explore new business directions that may not immediately benefit existing business units. Even if that new direction can leverage the resources and capabilities of certain business units, the units may not be motivated to explore the opportunity due to financial or other reasons. In both situations, corporate new venture units must take the lead and spearhead new businesses for the core business units. The challenge for new venture units is to gain the buy-in from business units as early as possible. The second integration archetype addresses this purpose. In this integration archetype, corporate new venture units take the lead in identifying and

initiating emerging business projects, but they find business units to either fund or to co-incubate the projects from early on. The key difference between this and the previous archetype is that corporate new venture units, rather than business units, initiate projects.

COEN adopted this integration archetype. This Japanese company set up a corporate new venture unit in Silicon Valley for developing and commercializing new technologies. Once the new venture unit selects projects, they approach business units in Japan to fund and sponsor the projects. The unit in Silicon Valley is responsible for hiring experienced entrepreneurs to test, explore, and incubate new projects. During the incubation process, sponsoring business units will periodically meet with new venture teams in Silicon Valley to check milestones and decide the project's future development.

COBI follows a similar, yet slightly different practice. COBI's corporate venture unit initiates emerging business projects. Once a project is identified, the new venture unit asks a business unit to fund the incubation and to co-host the project. Furthermore, each project requires an active sponsorship from a senior vice president in the hosting business unit. In the early incubation phases, new venture units take a leading role in working with co-hosting business units to develop new ventures. The company's corporate venture and the hosting business units jointly hold monthly meetings to monitor and develop new projects. When the project matures, the new venture unit hands the new businesses over to core business units for further development.

Several other organizations such as COEX and COME have adopted a similar integration archetype. It is important to note that in this integration archetype, resources provide the key integration mechanism, i.e., new venture units get business units to invest in the innovation projects early on. Because business units bear significant risks in funding these projects from

inception, they are motivated to support and accept the venture projects to mitigate the risks of losing sunk investments in new projects. In the early stages of the innovation projects, although the business units are involved administratively, corporate new venture groups tend to take more responsibility in developing the projects on a daily basis. But business units still have the power to influence the direction of and even terminate projects. Compared to the previous archetype, this one relies more heavily on resource contributions from business units to facilitate their commitment to and involvement in innovation projects.

This integration archetype is valuable to new venture projects that need to leverage resources from existing businesses. Under this integration archetype, new venture units must set emerging business agendas that are relevant to business units and be able to persuade business units to take on new venture projects from very early on.

4.3. Integration Archetype 3: Gradually involving business units into the incubation process (mid-stage)

Some new businesses are highly uncertain in their early phases of development and do not clearly fit into the core business unit's focus. Some will require a long time to incubate. Business units are typically reluctant to fund such projects or co-incubate them from the outset. Under these circumstances, new venture units need to initiate, fund, and incubate new ventures and gradually involve business units into the incubation activities as the projects become more promising in terms of financial viability.

COAS's integration archetype is a case in point. Its new venture unit normally initiates the projects and then invites business units to evaluate and approve the new projects that it intends to incubate. Once approved, the new venture unit uses its own budget to hire a group of people (normally about six) to incubate for around six months. At the end of these six months,

the project team reports to the business units for another round of approval. At this second stage, the new venture unit typically requires business units to increase their commitment if the project meets certain milestones. More specifically, the new venture team presents a set of business targets and milestones to be met at different time points in the following 12 months. They then check if the business unit will be willing to take over the project if the team achieves its performance targets and milestones at the end of the 12 months. Although business units' willingness to take over the project at this point is not a formal commitment, it clearly sends a strong message to new venture units and gives business units enough time to seriously plan taking over the new venture project if it meets its targets.

COPH's corporate new venture unit, as well as its R&D lab, follows a similar multi-step process to ensure the gradual buy-in from business units. At COPH's corporate R&D lab, the first phase of new venture development is managed by its "Innovation Research Program." Here, early research and new technical concepts are developed. If a project survives this phase, the project enters demonstration or proof of concept phase and is moved to the Technology Transfer Office for further development. At this second phase, the Technology Transfer Office works with customers to experiment and prove technology concepts. This is the third incubation phase, in which new venture units involve business groups to jointly work on new projects. In this third phase, business groups typically contribute people and partial funding to work with researchers at COPH's new venture unit. If a project survives this incubation phase, the new venture unit hands over the project to a business group for commercialization. At the commercialization stage, business groups assume full responsibility to launch the new business on a global scale.

COPH's new venture unit sets clear criteria for a project to move from one phase to the next. For example, for a project to move from proof of concept (second) phase to incubation

(third) phase, in which business units start getting involved, the project needs to demonstrate three milestones: one, that the technology is ready for the market; two, that early customers are ready to adopt the technology; and three, that the business groups are ready to work with corporate R&D to further incubate the technology. For a project to be fully handed over to a business group, the new project needs to be at or close to a financial break-even point. Business units need to believe that the new business will bring in sufficient financial contributions to justify investments in deploying these new products on a global basis. While deciding whether to take over a new venture project, business groups at COPH do their own due diligence to evaluate the market potential, growth prospects, and investment returns of the project.

In this archetype, companies simultaneously rely on the administrative and resource mechanisms, particularly the risk versus reward dimensions, to incrementally make business units integrate new venture projects into their operations. From the resources perspective, corporate new venture groups make business units increase their investments and resource commitment to a project as the project grows. Such an increasing commitment in resources is accompanied by increased integration on the administrative ownership and responsibility side. Business units have a stronger influence over new projects and more involvement in developing them and eventually taking over these projects entirely. This gradual increase of commitment gives business units the opportunity and time to become familiar with and assess the value and risks of the projects. This integration archetype works well for new venture projects that require long incubation cycles, face high level of uncertainty, or do not have a clear fit with existing business units at the initial incubation phase.

4.4. Integration Archetype 4: Transitional home (late-stage)

In many organizations, new venture units have limited resources. In order to continuously explore new opportunities, they need to graduate new venture businesses that are mature but still too young to be fully integrated into core business units. This creates a dilemma of where to house these adolescent emerging businesses. Some organizations address this problem by creating transitional business units (or emerging business units) to house new venture projects that have grown to an adolescent stage. Such emerging business units are both independent from early-phase incubation groups and also separate from core business units.

The high-end game computer project at COPH is a case in point. When COPH's incubator completed its early-stage incubation, it did not graduate or move this new business to the established notebook division. Instead, the company created a transitional business unit called Emerging Business Unit (EBU), which hosted the computer game business and two other emerging businesses.

Similarly, COIC's new business development system follows this transitional home integration archetype. Its new venture unit, Emerging Technology Group, is responsible for incubating early-stage new venture projects. When the project reaches certain milestones, such as sales targets, the new project is transferred to the Advanced Technology Group rather than to the company's Core Technology Group, where its established core businesses are managed. The Advanced Technology Group mainly deals with high-growth venture projects that have passed the initial emerging phase. At the Advanced Technology Group, the typical business development cycle is 12 to 18 months, significantly shorter than that of the Emerging Technology Group, an early-stage incubator (three to five years), but longer than that of Core Technology Group which operates on quarterly basis. At the Advanced Technology Group, the

focus is on helping transfer venture projects from emerging to established businesses and on providing a transitional home for new venture projects that have reached the adolescent phase.

Integration Archetype 4 provides adolescent emerging business additional time to develop until they are financially attractive to business units and are mature enough to withstand the discipline and procedures of established business. In this archetype, the integration mechanism does not depend on business units' administrative responsibilities in co-developing the new venture projects. Furthermore, business units do not invest in projects in the early or even mid stages of development. Rather, business units are motivated to integrate and invest resources into these new venture projects because of the greater certainty of expected returns.

In sum, the integration mechanism of Archetype 4 comes mainly from financial and resource channels; none or very little integration comes from shared administrative responsibility or ownership. This archetype has its weaknesses, however. Emerging business projects that grow and become too "mature" in the environment outside of a business unit can cause cultural clashes, resource duplications, and other issues when the projects are folded back to business units.

4.5. Integrating new venture and business units

These four archetypes utilize different mechanisms to facilitate business units' integration with new venture projects based on who initiates an innovation and when business units become involved (see Figure 1). At one extreme of the timeline, Archetypes 1 and 2 require business units early on to share administrative responsibilities to co-incubate new venture projects. On the other, Archetype 4's mechanism focuses on providing business units the incentives to integrate should they decide to invest resources in the new venture projects later on in their development. In Archetype 3, business units both invest resources and share development responsibilities when new ventures are still relatively young and face certain risks. The business unit's decision to

gradually increase its share of administrative responsibilities and resource investments in the projects, however, is affected by the decline of risks and expected returns of the venture projects as in Archetype 4.

INSERT FIGURE 1 HERE

Although Archetypes 1 and 2 are at one end of the timeline spectrum, they differ in terms of who initiates the new project and the related resource invested. First, in Archetype 1, new venture projects are started by business units, whereas in Archetype 2, corporate new venture units initiate new projects. In turn, business units share more extensive ownership of new venture projects in Archetype 1 than in Archetype 2. Second, there are key differences between these two archetypes in the resource dimension. Archetype 2 requires business units to be the primary investor in a venture project from inception. This investment is a strong mechanism to motivate business units to support venture projects. In Archetype 1, however, business units are not the primary investor to the projects at the beginning. In general, both archetypes necessitate investment of financial or administrative resources into the project early on by the business units.

In contrast, the integration mechanism in Archetype 4 is mainly incentivizing business units to integrate even though the business units have not shared administrative responsibility and/or invested resources in the projects. Archetype 3's integration mechanisms entail the elements of Archetypes 1 and 2 on the one hand, and that of Archetype 4 on the other.

We summarize these four archetypes in Table 3. In Table 3, we explain the key characteristics, the distinctive integration archetype used by the business units and new venture units to integrate the new venture projects, the contexts and environments in which each archetype is suitable, and the types of new venture projects that might benefit from a given

archetype. In Table 3, we also indicate that for a given new venture project, companies can only choose only one of the four archetypes to fold back the new venture projects into business units; given the temporal dimension of the process, they archetypes are mutually exclusive. For example, if a company uses Integration Archetype 2 (New venture units initiating new projects, involving business units early on) to create a business unit to co-fund and co-incubate a new venture initiated from corporate new venture unit, the company can no longer use other archetypes to integrate the same new venture. In this sense, these four archetypes substitute each other for a same new venture project. In addition, these four archetypes can also be categorized along two dimensions, based on the organizational units that initiate new ventures and the point in time at which collaboration is solicited.

INSERT TABLE 3 HERE

5. Discussion

In this paper we contribute to the organizational ambidexterity literature by presenting formal integration mechanisms that enable collaboration between corporate new venture units and core business units to develop emerging businesses. In many organizations, new venture units are interested in exploring innovations that are not typically addressed by existing business units. At the same time, they need the resources, capabilities, and support that business units possess. The integration archetypes identified in our research provide some insights into the practices by which business units and new venture units might achieve integration under ambidextrous structures.

5.1. Theoretical and practical contributions

Despite the plethora of high-level recommendations on informal mechanisms through which organizational ambidexterity can be achieved (Burgers et al., 2009; O'Reilly and Tushman, 2004), there is little information about the formal mechanisms through which managers of business units and new venture units achieve ambidexterity. Previous research on ambidexterity treats it as a strategic variable, as a quality that firms possess or do not possess (Carter, Klegg, and Kornberger, 2008). In contrast, we empirically identify the formal integration archetypes through which new venture units and business units in all firms can achieve ambidexterity.

Our work complements Gassmann et al.'s (2012) study on the integration mechanisms in ambidextrous structures at the business unit level. Gassmann et al. (2012) identified informal mechanisms, such as socialization, informal communication, and cross-departmental relations, through which such integration occurs. In this study we offer new insights into formal integration mechanisms. In particular, based on who initiates new venture projects and the timing of integration, we identified four formal integration archetypes. These four integration archetypes

rest on two integration mechanisms: administrative accountability and resources invested in new ventures.

These two integration mechanisms and four archetypes rest on the theoretical formal structure concepts of formalization, output control, and strategic planning. To elaborate, the types and timing of resources and administrative accountability associated with business units and new venture units are clearly documented and standardized, i.e., formalized across the organization. Both new venture units and business units are held clearly accountable for their output through project milestones and other performance indicators. Thus, output control is the second key formal integration mechanism. The strategic planning aspect of formal structure encompasses business units and new venture units, determining what kinds of new ventures to incubate and the appropriate timing at which projects are transferred. Our study, then, highlights how formal structures operate at the level of the business unit and new ventures.

Another important theoretical contribution of this study is the integration of temporal and spatial aspects of ambidexterity. While prior theory has treated these as two different routes to achieving ambidexterity (see, e.g., Raisch and Birkinshaw, 2008; Raisch et al., 2009; Tushman and O'Reilly, 1996), we highlight how time of integration is a key dimension through which innovative projects succeed in gaining traction with core business units. To be specific, we show how the temporal dimension of when to integrate determines the spatial processes by which new ventures get integrated into organizations. For example, in Integration Archetype 4, the decision of new venture units to independently develop projects in early stages (a temporal dimension) without determining a home for these projects at the outset necessitates the creation of transitional business units (a spatial separation). In contrast, in Integration Archetypes 1 and 2,

early integration (a temporal dimension) enables spatial integration of new ventures into the business units with ease.

Our work is relevant to managers of organizations who are grappling with the question of how to effectively integrate innovations developed outside the core business units into the organization's core businesses. In many organizations corporate executives set up new venture groups at the corporate level to promote, initiate, and even incubate new venture projects. One of the key challenges these organizations face is how to leverage organizations' existing resources and assets to help scale up the new ventures. In most organizations, such key resources and assets reside at business units. Thus corporate new venture groups need to fold new venture projects back into the core business units for scaling up or commercialization. This requires buy-in and support from the business units. But many organizations fail to successfully transfer their new ventures to business units due to the lack of support and commitment from the business units. Our findings illustrate several integration mechanisms to foster cooperation and mutual support between business units and corporate new venture groups. We provide the integration archetypes, the organizational contexts, and types of new venture that are appropriate for a given integration archetype. We hope that managers of organizations can use Table 3 as a ready reckoner to identify different archetypes that would work effectively in their context. Furthermore, we suggest below some additional ways to effectively apply the integration mechanisms discussed in this study.

First, managers need to be cognizant of the organizational contexts required to apply different integration mechanisms. For example, Integration Archetype 1 (business units initiating new projects, new venture units co-incubating the projects) is more appropriate for organizations in which business units enjoy a high level of autonomy but at the same time need assistance in

incubating new ventures. Similarly, organizations with small budgets and small teams doing new venture activities at the corporate level may find it difficult to apply Integration Archetype 3 (new venture units initiating new projects, then gradually involving business units into the incubation process) and Integration Archetype 4 (new venture units initiating new projects and later housing projects into transitional organization units), as both mechanisms require large corporate investment and effort.

Second, managers also need to consider the nature of new ventures when applying different integration mechanisms. For some innovation projects, it is difficult for new venture units to involve business units early on as in Integration Archetype 2 (new venture units initiating new projects, involving business units from early on). For example, if exploratory innovations differ from the business units' strategic visions, or are highly uncertain in nature, business units might not be willing to collaborate with new venture units early on. At the same time, new venture units might also be apprehensive about approaching business units to incubate. In such situations, Integration Archetype 3, in which corporate new venture units approach business units and involve them gradually after the new ventures bring in attractive returns, might be the preferred approach.

Third, although companies cannot use multiple integration archetypes for the same new venture project, they can simultaneously use multiple integration archetypes for different new venture projects, as each integration archetype helps to integrate new venture activities of corporate and business unit levels from different aspects. For example, board committees in Integration Archetype 2 (new venture units initiating new projects, involving business units from early on) mainly help the corporation new venture units and business units to cooperate on early-phase new venture projects. In contrast, Integration Archetype 4 (new venture units initiating

new projects and later housing the projects into transitional organization units) mainly facilitates the integration between corporate new venture group and business units of mid- to late-stage new venture projects. Together, these different integration mechanisms can help corporate new venture group and business units to support each other in incubating new venture projects.

5.2. Limitations

Despite the contributions of our paper, which highlights the formal mechanisms for achieving ambidexterity in practice, there are certain limitations. First, our data is restricted to a small group of organizations in Silicon Valley that were focusing on product innovations. This might reduce the generalizability of our findings to other settings. However, we have tried to include organizations from a variety of industries in our sample to make our findings generalizable to a broad group of organizations. Although we were able to find several processes and their subtle variations, it is not clear if these findings can be applied in service innovation settings or to other organizations proposing new ventures. Future studies should examine whether these integration archetypes are applicable in other contexts.

Furthermore, we were able to identify four integration archetypes in this study, but have not specified how the characteristics of projects and organizational life cycles might impact their use. For example, service organizations might use different integration archetypes as compared to product organizations. Similarly, younger firms might have business units that are more likely to be entrepreneurial in nature and therefore use Integration Archetype 1 when they initiate projects and involve new ventures. In contrast, older firms might be more prone to Integration Archetypes 3 and 4 and integrate new ventures only after the merits of the new project have been proven. Future research should identify these various dynamics and discern when organizations move from one integration archetype to the other.

In addition, although we discussed the strengths, weaknesses, and conditions under which different integration archetypes might be effective, future research might address other antecedent conditions under which these archetypes might be applicable. In this exploratory study, our focus was on determining the strategic practices through which organizations can achieve ambidexterity. Regardless, our integration archetypes will enable organizational managers to focus on achieving ambidexterity through strategic processes as they incubate new projects.

6. Conclusions

Organizational ambidexterity is widely used by organizations to achieve their conflicting goals of exploration and exploitation. With this research we seek to investigate the formal mechanisms that enable the integration of structurally separated units. We identify four integration archetypes based on the actors who initiate the collaboration and the point in time at which collaboration is solicited. In addition, our formal integration mechanisms identify the administrative and resource mechanisms at different points in time at which funding is provided and the deliverables for each stage are decided. We also highlight the contexts in which each of these integration archetypes are appropriate. It is our hope that researchers and managers of organizations will be able to use these archetypes as they grapple with the challenging question of how to integrate their complex ambidextrous structures.

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Table 1. Description of organizations in the study

Organization	Main Business	New venture units analyzed	Main responsibilities of the new ventures and their relationships with business units
COBI	Manufactures computer software and hardware, and offers related infrastructure, hosting, and consulting services.	Corporate emerging business incubator.	Responsible for developing new businesses for the entire corporation. Also responsible for coordinating new business development activities of various business groups.
COPH	A multinational corporation offering computer hardware, software, IT consulting, and services.	Corporate R&D lab and related new ventures.	Responsible for developing future technologies and incubating them into viable businesses.
COIC	Designs, manufactures, and sells network equipment and devices.	Corporate emerging technology group.	Responsible for soliciting innovation ideas, identifying and incubating new business opportunities into a viable emerging business with several hundred millions of dollars of revenues.
COEN	Provides information technology (IT) and network solutions to business enterprises, communications service providers, and government agencies.	North American-based corporate new business development center for a large Japanese company.	Responsible for scouting new technologies, business opportunities, and partners in North America, and incubating these opportunities into new business.
COME	Through cloud computing, this company enables businesses and service providers to transform their operations and deliver information technology as a service. It helps organizations store, manage, protect, and analyze information in a more agile, trusted, and cost-efficient way.	The Advanced Technology Venture group (a new venture group) within the corporate Chief Technology Officer's office.	Responsible for identifying and incubating emerging businesses from three types of opportunities: (a) disruptive, (b) greenfield opportunities that are not core to existing business units, and (c) the opportunities that require cross leveraging among multiple business units.
CONI	CONI is a leading semiconductor corporation. It makes motherboard chipsets, network interface controllers and integrated circuits, flash memory, graphic chips, processors, and other devices related to communications and computing.	New Business Group, a corporate new venture unit	Responsible for helping the company to identify and incubate new business.

Table 1. Description of organizations in the study (cont.)

Company	Main Business	Main incubation centers analyzed	Main responsibilities of the incubators and their relationships with business units
COEX	COEX is a multinational document management corporation. It produces a range of printers, photo copiers, digital production printing presses, and related consulting services and supplies.	The corporate lab and related new venture unit.	This center is responsible for exploring and developing new technologies and transforming these technologies into new businesses for the entire corporation.
COAS	COAS is a multinational software corporation that makes enterprise software for managing business operations and customer relations. Its products include ERP system, enterprise data warehouse solutions, and mobile products.	A global business incubator for the entire corporation.	Help the corporation identify and incubate new business opportunities and to assist business units improve their new business development process.
COTS	COTS is a leading hearing aids company, which offers, among other products, digital hearing aids, noise management and speech preservation system, wireless hearing aids, and hearing aids for mobile devices.	Corporate research center.	Responsible for exploring long-term new technologies and business opportunities for the corporation.

Table 2. Different data sources used in research

Company	Archival Data	Interview Data	Interviewee and Interview Frequency
COBI	We collected information from the company website, media reports, and published research. These data provided the background information of the history and evolution of COBI's innovation activities and challenges. We also collected information of a specific corporate innovation program that was managed by the corporate incubator.	We relied on interviews to verify and update public information. The public data also allowed us to quickly focus on the key research questions pertaining to the integration and cooperation between business units and new venture groups.	<ul style="list-style-type: none"> • Director, Software Strategy, Corporate Venture group (2) • Partner, Global Research director (1) • Program Director, Technology & Solutions, Software Group (2)
COPH	We collected archival data from the company website and media reports. These data explain COPH's overall corporate innovation activities. We also found a case explaining COPH's innovation in developing new businesses.	The archival data provide a good context for us to develop interview questions and to better understand interview data. The case also provided us an in-depth understanding to help us further appreciate COPH's organizational practices in managing innovation.	<ul style="list-style-type: none"> • Director, Corporate Lab, Strategy and Innovation Office (2) • General Manager, Business Development (2) • Director, New Business Venture, Strategy and Corporate Development (1)
COIC	We first collected COIC's information from published reports. In addition, the author also attended several public presentations made by COIC executives. These public data provided detailed background information to help us decide the right questions to ask in interviews.	The archival data already provided in-depth background information, which allowed us to focus on organizational practices that COIC followed to manage the integration and cooperation between corporate new venture group and core business units.	<ul style="list-style-type: none"> • Senior Director, Innovation Emerging Technology Group (2) • Director, Business Development (2) • Senior Manager, GBSG Service Organizations (2)
COEN	We collected background information of this company from website, media, and annual reports; we did not get information on its innovation activities from these sources.	In our interviews, we first collected information about the company's overall innovation programs, then moved on to discuss specific innovation projects and the organizational practices that COEN followed to manage the innovation projects.	<ul style="list-style-type: none"> • General Manager, Corporate Business Development (2) • Director, Strategy & New Business Development, IT Platform & Solutions Group (2)

Table 2: Different data sources used in research (cont.)

Company	Archival Data	Interview Data	Interviewee and Interview Frequency
COME	We were able to collect some basic information of COME's innovation activities from media reports. The author also attended presentations made by innovation executives of the company.	Our first interviews focused on understanding COME's overall set up regarding its corporate innovation programs. We then discussed the specific innovation projects and the organizational arrangements in managing integration and cooperation between corporate new venture group and business units.	<ul style="list-style-type: none"> • Senior Director, Advanced Technology Ventures, Office of CTO (2) • Director, Technology Alliance (1) • Director, Advanced Technology Ventures, Office of CTO (1)
CONI	Our archival data mainly come from media reports and published cases and public presentations by the company executives. These discuss general information regarding CONI's innovation activities and the challenges the company faces.	We first relied on interviews to help us verify the background information that we collected from archival data. Our interviews mainly focus on the organizational structure and processes at CONI to manage its corporate innovation projects and initiatives.	<ul style="list-style-type: none"> • Director of Strategic Investments (1) • Director, New Business Initiative (2) • Manager of Process/System Engineering, Digital Enterprise Group (1)
COEX	We collected archival data from published reports that describes the history and evolution of COEX's innovation activities. These data provided contextual background for us to further study COEX's specific organizational practices in managing innovation programs.	Our interviews focused on specific organizational issues, including communication, inter-department interactions, and management processes that COEX dealt with when managing its innovation projects.	<ul style="list-style-type: none"> • Senior Manager, Corporate Research Lab (1) • Manager, Corporate research lab (1)
COAS	The archival data mainly comes from the company's website and published reports. These data mainly covered general company background information. Our main source of data comes from interviews.	Our first interviews focused on understanding COAS' overall innovation arrangements. We then focused on certain aspects of innovation management structure and practices that COAS followed to manage the integration and cooperation between its corporate new venture groups and business units.	<ul style="list-style-type: none"> • Senior Vice President, Head of Global Business Incubator (1) • Vice President, Ideation, Global Business Incubator (1) • Director, Co-Innovation Group (1)
COTS	We collected basic company background information from the company's website and media reports. The main data source is from interviews.	Through several interviews, we collected rich information on COTS' organization structure and processes to manage its corporate innovation projects.	<ul style="list-style-type: none"> • Vice President of Corporate Research (3) • Manager, New Venture Unit (1)

Table 3: Summary and comparison of the four integration archetypes

Integration Archetype	Key characteristics	Distinctive formal mechanisms to integrate new venture projects into BUs (business units)	Suitable organizational contexts/environments	Suitable new venture projects
Integration Archetype 1— BUs initiating new projects, new venture units co-incubating the projects	New venture units help BUs to co-incubate new projects initiated by the BUs, especially in early phases. The new venture units' help could include knowledge, people and funding.	This archetype relies on administrative integration mechanism. First, new venture projects are initiated by BUs, which also actively participate in the co-development of the projects, making BUs accountable for the projects. On the resources integration mechanism, although corporate new venture units invest more resources than BUs to co-develop the projects, BUs still need to contribute some resources to the projects. Furthermore, investments from new venture units are contingent upon BUs' agreement to increase their investments and ownership to the projects should the projects meet certain development milestones.	Suitable for organizations in which BUs enjoy high power and autonomy but need support in incubating new ventures.	Venture projects that are adjacent to BUs' existing business or exploitation type of new ventures. Mainly applies to early-stage new ventures.
Integration Archetype 2— New venture units initiating new projects, involving BUs early on.	BUs are involved in new projects initiated by new venture units from very early on. Such early involvement could include BUs taking over the venture projects when the projects are still very young, or BUs co-fund and co-incubate a venture project from its inception.	In this archetype, the integration mechanism mainly comes from the resource dimension. BUs are the primary investor to the venture projects from inception. Such investments motivate BUs to participate and support new venture projects thus to protecting the resources they have invested. On the administrative dimension, BUs participate in the early-stage development of the projects, but corporate new venture units are more active and take more responsibility in incubating the projects.	Suitable for organizations whose new venture units actively lead new venture development at the same time want BUs to support and take over these new ventures.	Suitable for new ventures that BUs are not motivated to initiate (thus new venture units initiate the projects), but for projects that need BUs' early support to grow and scale up. Mainly used in early phase of venture projects.

Table 3: Summary and comparison of the four integration archetypes (cont.)

Integration Archetype	Key characteristics	Distinctive formal mechanisms to integrate new venture projects into BU(business units)	Suitable organizational contexts/environments	Suitable New venture projects
Integration Archetype 3— New venture units initiating new projects, then gradually involving BUs into the incubation process	New venture units first initiate and incubate venture projects, then gradually involve BUs to co-fund and co-incubate the projects. Later, BUs fully take over the projects.	This archetype relies on both administrative ownership and resource mechanisms to help integrate new venture projects. As BUs gradually increase their involvement in co-developing venture projects with corporate new venture unit, they become more committed to accept and integrate new venture projects. At the same time, BUs’ decision to increase resource investment to the projects is motivated by their expected returns and rewards from the projects. On the other hand, in this archetype, BUs start to invest resources to venture projects when the projects still face uncertainty and are still risky. Once BUs invest in the projects, they are motivated by another factor to help and support the venture projects, i.e., to reduce the risks of losing the resources they have already invested .	Suitable for BUs that enjoy high autonomy and have limited resources to incubate new ventures. Also suitable for organizations whose new venture units have the budget and capabilities to independently incubate new ventures for some time without the support of BUs. Mainly applies to mid stage corporate new ventures.	Suitable for new ventures that require long incubation cycles and large amount of resources to incubate.
Integration Archetype 4 — New venture units initiating new projects and later moving the projects into transitional organizational units.	Creating transitional organizational units to host new ventures that are too “mature” for new venture units but are still too young or vulnerable to be directly folded back into established BUs.	In this archetype, the primary integration mechanism rests on financial resources dimension. More specifically, it is to provide business units with incentives by making new venture projects financially more attractive and less risky, thus motivating business units to accept and integrate new venture projects into their internal systems. In this archetype, the integration mechanism is not heavily related to business units’ motivation to control the risks of losing the resources they already invested into new venture projects, nor does the archetype depend on administrative ownership or responsibility mechanisms.	Suitable for organizations whose new venture units have limited power in influencing BUs’ decisions on accepting corporate new ventures. Suitable for organizations whose BUs have limited ability in dealing with new ventures that are financially unproven.	Suitable for projects that require an independent organizational environment to grow without the constraints of the BUs. The projects should be such that they can be folded back into business units after maturity without too many cultural clashes.

Table 4. Integration archetypes used by different organizations

Organization	Integration archetypes used
COBI	COBI's corporate emerging business group maintains close relationships with business units through committees and other structures to inform business units about the projects that they are working on. In addition, COBI extensively uses Integration Archetype 2, in which the emerging business group initiates projects and then finds business units to co-incubate the innovation projects early on. COBI's practices also incorporate the characteristics of Integration Archetype 1, which is to help business units' innovation projects. Since business units at COBI have their own incubation systems, COBI's corporate emerging business group helps business units' projects by providing extra funding and sharing emerging business development expertise, etc. Our study mainly focuses on COBI's practices in Archetype 2.
COPH	For the committee or board structure, there is a committee consisting of senior executives of business units of COPH. The committee constantly interacts with COPH's Corporate Lab and the related new business unit (or "the COPH corporate unit" for short), Twice a year, this COPH corporate unit invites executives from business units to showcase their new venture projects. The COPH corporate unit extensively uses Integration Archetype 3, in which projects initiated at the COPH corporate unit are gradually transferred to business units as the projects becomes more mature. In order for a project to be gradually integrated into a business unit, the project needs to meet specific criteria and the business unit will do its own due diligence analysis to decide whether or not to accept the project. COPH also uses Integration Archetypes 3 and 4. In the archetype 4 situation, when a project successfully grows to adolescent phase, the project, together with other projects that reach similar adolescent phases, is put into an emerging business unit, rather than a mature business unit.
COIC	COIC, as a company, extensively uses board and committee structures to supervise and coordinate innovation projects in different parts of the company. COIC recently scaled back the board and committee structure but still considers it as an important mechanism to manage innovation. COIC's corporate emerging technology group mainly uses Integration Archetype 4, where it relies on transitional organizational units to house new business projects that reach adolescent stages. The emerging technology group spends a long time up-front to fund and incubate innovation projects until the projects are mature enough. Such projects are not likely to be easily accepted by business units if they are thrown into business units as soon as they reach adolescence. Housing them in transitional organizational units for further growth make these projects more attractive and less risky for business units to eventually accept them.
COEN	At the corporate HQ in Japan, COEN identifies people who are responsible for connecting COEN's North American (NA) business center to different business units in Japan. These people acting as liaisons serve similar functions as the committee structure discussed in the article, in which business units are exposed to the innovation projects that COEN's North America new venture unit is working on. The main practice that COEN uses is Integration Archetype 2. As indicated in the article, COEN's NA new venture unit initiates new innovation projects, then ask business units to fund and co-incubate the projects.
CONI	In the early days, CONI's corporate new business group initiated new venture projects, but did not involve business units to co-incubate these projects. This created many difficulties for CONI's new business group; later, CONI's corporate new business unit started to adopt Integration Archetype 1. As explained in the article, they focus on the projects that business units initiate and co-incubate the projects with the business units. They also require business units to increase their responsibility and support as a project grows.

Table 4. Integration archetypes used by different organizations (cont.)

Organization	Integration archetype used
COME	COME has several committees such as CTO Council and Technology Review committee. Presidents of business units participate in these committees. This committee structure allows business units to know and influence the projects that COME’s advanced technology unit (or “the COME corporate unit”) is working on. It also helps coordinate innovation projects between business units and the COME corporate unit to avoid duplications and create synergy. COME’s corporate unit also co-funds and co-incubates projects that are initiated by business units (Integration Archetype 1). But COME’s corporate unit more frequently uses Integration Archetype 2, in which innovation projects are either initiated at the corporate level (e.g., CTO office) or from corporate wide innovation competition. For these projects, the COME’s corporate unit mainly funds these projects and invites business units as project sponsors from early on, while business units give guidance and go or no go recommendations to these projects. Many times, the COME corporate unit also asks sponsoring business units to contribute engineering and other staff support.
COEX	Like other companies in our research, there is a joint committee coordinating business units and COEX’s corporate lab and its corporate new business development unit. The committee also decides funding and new development directions of COEX’s corporate lab and related business development units. COEX also uses Integration Archetype 1. Here, business units pick certain problems or directions they want to work on, and then business units invite COEX’s corporate lab and related new business unit to work on those new projects. In such situations, the funding mostly comes from business units. We also find that COEX uses Integration Archetype 2 extensively. In this practice, COEX’s corporate unit people initiate projects and present them to business units for funding. Sometimes COEX’s corporate unit also co-funds certain projects with business units. Once a project begins, COEX’s corporate unit leads the development of the projects but business units are constantly involved to monitor and influence the development of these projects.
COAS	COAS’ practices mainly consist of committee structure and Integration Archetype 3, in which business units gradually take over innovation projects, although we find that the company also uses Integration Archetype 1. For the board and committee structure, COAS establishes an approval board to supervise and approve new venture projects that the corporate new business group plans to incubate. Key executives of various business units sit in this approval board. This board structure also keeps business units well informed of the new venture projects that the corporate unit works on, thus avoiding the duplications where corporate and business units work on the same or similar projects. COAS also extensively uses Integration Archetype 3 to gradually increase business units’ commitment to the new venture projects. As explained in the article, corporate new business group typically incubates a new venture project for the first six months, and then the corporate group reports to the approval board for further approval, while at the same time, the group also requires business units to increase their commitment to support or even take over the project if the venture project achieves certain milestones in 12 months. Besides these mechanisms, COAS also adopts Integration Archetype 2 (involving business units from early on). Although COAS’ corporate new business group does not ask business units to fund and/or co-incubate innovation projects from very beginning, the corporate group constantly informs and communicates with business units about the progress of the projects from inception.
COTS	Although COTS’s corporate research center constantly communicates with various product groups, it does not have a formal committee representing business units to monitor innovation projects at the corporate level. This is to give the corporate research center maximum autonomy in exploring new directions. The corporate research center adopts Integration Archetype 2. In particular, when the corporate center starts working on an innovation project, it invites marketing and sales people from business units to comment and provide feedback on the projects, as these people are close to customers. Such early participation by the business unit gives business units a sense of ownership, which helps the project transition to these business units later.

Figure 1. Formal Integration Archetypes

