

**The Emergence of Boundary Spanning Competence in Practice:
Implications for Information Systems' Implementation and Use***

by

Natalia Levina

New York University
Stern School of Business
Information Systems Group/ IOMS
44 West Fourth St, Suite 8-78 (KMC)
New York, NY 10012
Office Phone: 212-998-0850
Fax: 212-995-4228
Email: nlevina@stern.nyu.edu

Emmanuelle Vaast

Long Island University
School of Business, Public Administration and Information Sciences
1 University Plaza—H700
Brooklyn, NY 11201
Office Phone: 917-306-5348
Fax: 718-488-1125
E-mail: emmanuelle.vaast@liu.edu

*** The authors have contributed equally to the paper**

**The Emergence of Boundary Spanning Competence in Practice:
Implications for Information Systems' Implementation and Use ***

This work was sponsored in part by MIT's Center for Information Systems Research, Cambridge, MA, and by the CRG, Ecole Polytechnique, Paris, France.

Natalia Levina is an Assistant Professor in the Information, Operations, and Management Sciences Department at the New York University Stern School of Business. Her current research interests include understanding collaboration practices on multi-party systems development projects, knowledge management in IT service delivery organizations, IT outsourcing strategy and implementation, and technology design principles in heterogeneous environments. Her works have appeared in *MIS Quarterly*, *Applied Intelligence Journal* and *Reflections: The Society for Organizational Learning Journal*. Dr. Levina has a Ph.D. in Information Technology from the Massachusetts Institute of Technology and a Master's in Mathematics from Boston University.

Emmanuelle Vaast is an Assistant Professor in Management of Information Systems at the School of Business, Public Administration and Information Sciences, Long Island University. Her research interests deal with situated learning and the construction of intra-organizational boundaries and with IS use as well as with the relationships between representations and practices in the context of IS use. Her work has been published in *Information and Organization*, *Management Communication Quarterly*, *SIM* and *Information Research*. She earned her Ph.D. in Management of Information Systems from the Ecole Polytechnique, Paris, France and is a former student of the Ecole Normale Supérieure and Sciences Po.

1 This and other examples of failures raise the question of how organizations not only aspire
2 to, but actually develop and use their KM competence so as to support their members in
3 spanning multiple boundaries. In other words, *how does boundary spanning competence emerge*
4 *in practice?* How do individuals, such as the NASA's manager, actually come to fulfill their
5 boundary spanning roles and how do IS actually become used for boundary spanning? To
6 understand how boundary spanning emerges in practice (i.e., in what people do) as opposed to in
7 theory (i.e., what people aspire to do), this paper uses and extends a practice-based view on KM
8 (Orlikowski 2002; Carlile 2004) and data from two qualitative field studies. It contributes to KM
9 literature by developing a dynamic (Griffith et al. 2003) and dialogic (Schultze and Leidner
10 2002) perspective on the *emergence* of boundary spanning competence in practice.

11 The rest of the paper is organized as follows: we first review and extend a practice-based
12 perspective on KM in organizations and then tie this perspective to the existing literature on
13 boundary spanners and boundary objects. We then present our empirical approach and our
14 analysis of the two field studies. The discussion section analyzes the processes involved in the
15 emergence of an organizational competence in boundary spanning. Finally, we draw implications
16 from our newly developed understanding for IT implementation and use.

17 **THEORETICAL DEVELOPMENT: A PRACTICE-BASED PERSPECTIVE**

18 **ON BOUNDARY SPANNING IN ORGANIZATIONS**

19 The proposition that spanning boundaries of diverse professional and organizational settings
20 can become a key organizational competence has received increasing theoretical support for
21 some time now (von Hippel 1988; Kogut and Zander 1992; Nonaka 1994; Grant 1996). More
22 recently, a few researchers have investigated empirically what kinds of organizational practices
23 actually allow firms to claim such competence (Carlile 2002; Orlikowski 2002). We draw on

1 these recent developments in KM literature and on original ideas from Bourdieu’s theory of
2 practice (Bourdieu and Wacquant 1992) to understand how such practices actually emerge.

3 **A Practice-based Perspective on Knowledge Management in Organizations**

4 Sociologists use the concept of practice to understand the dynamics of societies based on
5 what people do (Bourdieu 1977; Certeau 1984; Giddens 1984). *Practice* is a “*recurrent,*
6 *materially bounded and situated action engaged in by members of a community*” (Orlikowski
7 2002: 256). Through practice, reflexive agents engage to produce, reproduce, or transform
8 structures which, in turn, enable and constrain their actions (Bourdieu 1977; Giddens 1984). In
9 the KM literature, this perspective supports the claim that “knowing is an ongoing social
10 accomplishment, constituted and reconstituted in everyday practice” (Orlikowski 2002: 252-
11 253). Thus, a practice view on KM is necessarily a dynamic view (Griffith et al. 2003).

12 Practice is bounded in a specific material, historical and social context that shapes what
13 agents do and gives meaning to habitual actions (Suchman 1987; Lave 1988). This view allows
14 us to see where boundaries in practice come from. As agents engage in practice, they develop a
15 continuity in their local practices, which allows them to act knowledgeably in a given context but
16 also distinguishes them from others who do not engage in this practice or engage in it only
17 peripherally (Wenger 1998: 103). Practice theorists have conceptualized this phenomenon as the
18 emergence of *fields* (Bourdieu and Wacquant 1992: 96-120)¹. By engaging in fields, agents
19 pursue a joint *interest* (an inclination and ability to succeed in a given endeavor), but also
20 differentiate themselves from outsiders who do not pursue the same interest. At any given time,
21 agents are engaged in multiple, nested fields. Within each field, agents are distinguished based
22 on their attainment of stakes offered by this field (into “haves” and “have-nots”) (ibid).

¹ We rely on the concept of “fields” instead of “communities of practice” (Lave and Wenger 1991), because the latter is limited in addressing the power dynamics involved in boundary spanning (Contu and Willmott 2003).

1 Through their engagement in fields, agents produce different kinds of resources (*capital*) that
2 they can accumulate and use as bases of power in a field. Bourdieu distinguishes four key
3 species of capital: economic capital (e.g., money, time, IT), cultural capital (e.g., professional
4 expertise, education, ownership of information), and social capital (which social networks an
5 agent can draw on); in addition, symbolic capital is defined as the ability to name any other
6 resource as valuable—the power to name and classify things. Agents in every field are engaged
7 in producing a unique sub-specie of one of these species of capital (1992: 119).

8 Discontinuities in practice (*boundaries of fields*) create opportunities for organizations to
9 develop a knowledge-based competitive advantage. For example, as engineers engage in their
10 professional practice, a boundary between their field of practice and the field of practice of
11 marketing people emerges and grows. Organizations that successfully engage engineers and
12 marketing specialists in relating practices from these fields (what we will refer to as *boundary*
13 *spanning*) develop a knowledge-based competence in product development (Dougherty 1992;
14 Carlile 2002). In addition to spanning boundaries of professional fields, organizations may
15 develop competencies in spanning boundaries of organizational (Powell 1990; Dyer and Singh
16 1998), academic (Liebeskind et al. 1996), national socio-economic (Lam 1997), and other fields.

17 Such competencies are produced through the engagement of agents in practices that agents
18 produce to navigate and negotiate multiple boundaries (Orlikowski 2002: 267). These practices
19 must be different from practices within specific fields that contributed to the production of the
20 boundary in question; otherwise, agents would only reproduce the boundary. Whatever repertoire
21 of practices agents rely on in spanning boundaries (Orlikowski 2002: 267), they produce these
22 practices in the context of prior actions and relationships and in pursuit of a common interest,
23 that is, in the context of a field. We propose that the emergence of a boundary spanning

1 competence in practice is associated with the emergence of a *new joint field* which unites agents
2 in pursuit of a common organizational interest, but also distinguishes them from others who are
3 not engaged in such pursuit. In practice theory terms, developing an organizational competence
4 in boundary spanning means producing a specific type of organizational capital ("social capital"
5 according to Nahapiet and Ghoshal 1998) by using and relating capital produced in other fields
6 ("transforming knowledge boundaries" according to Carlile 2004).

7 The concepts of field and capital allow us to engage in a dialogical discourse on KM by
8 offering a way of "*tracing power and domination to claims of expertise*" (Schultze and Leidner
9 2002: 217). While Orlikowski's (2002) work has demonstrated that an organizational
10 competence in spanning boundaries is embedded in the everyday practice of its members, our
11 interest is in investigating how a new joint field where such practices are produced emerges. To
12 achieve this, we draw on two prominent concepts in the organizational literature on KM:
13 boundary spanners and boundary objects. We argue that currently the literature has developed a
14 rather static view of these concepts, focusing on either what these "mechanisms" are supposed to
15 achieve in theory, or on what happens in practice. What is missing is an understanding of how
16 the aspirations behind "boundary spanning mechanisms" *become* or *do not become* enacted in
17 practice.

18 **Boundary Spanners in Theory and in Practice**

19 The literature on KM has emphasized the importance of relying on individuals performing
20 boundary spanning roles (Hargadon and Sutton 1997; Davenport and Prusak 1998; Swan and
21 Scarbrough 2001; Cross and Parker 2004; Pawlowski and Robey 2005). Cross and Parker (2004)
22 characterized *boundary spanners* as vital individuals who facilitate the sharing of expertise by
23 linking two or more groups of people who are separated by location, hierarchy, or function.

1 Managers of R&D groups, sales representatives, HR specialists, and IT professionals are prime
2 examples of professionals expected to span inter and intra-organizational boundaries (Allen and
3 Cohen 1969; Tushman 1977; Wenger 1998; Pawlowski and Robey 2005).

4 The literature on boundary spanners has taken two disjoint directions. First, numerous
5 research studies have identified and classified the *roles* that boundary spanners are expected to
6 perform (e.g., Aldrich and Herker 1977; Leifer and Delbecq 1978; Tushman and Scanlan 1981;
7 At-Twajjri and Montanari 1987; Ancona and Caldwell 1992; Friedman and Podolny 1992; Cross
8 and Parker 2004). For example, the boundary spanner's roles have been distinguished into
9 representative vs. gatekeeper, advice vs. trust broker (Friedman and Podolny 1992) as well as
10 scout, ambassador, sentry, and guard (Ancona and Caldwell 1992). Second, other studies have
11 focused on *individuals* involved in boundary spanning in practice. These studies indicated that
12 the multiple roles of boundary spanners are often in conflict, which leads to stress and burnout
13 (Lyonski and Johnson 1983; Baroudi 1985; Lyonski 1985; Singh and Rhoads 1991; Dubinsky
14 et al. 1992; Singh et al. 1996). It is also hard to find individuals to perform these roles as they
15 should be sensitive to social cues (Caldwell and O'Reilly 1982) and competent in multiple
16 domains (Nochur and Allen 1992). Even qualified individuals may choose to avoid the
17 uncomfortable feeling of dual, often conflicting, identification and marginalization within each
18 field spanned (Bourdieu 1977; Tajfel 1978) and may stick to one side rather than span
19 boundaries (Wiesenfeld and Hewlin 2003). One of the recommendations from the literature is to
20 assign different boundary spanning roles to different individuals thus preventing role conflicts
21 (Friedman and Podolny 1992). In organizational practice, however, boundary spanners tend to
22 occupy managerial positions (Wiesenfeld and Hewlin 2003) and may be reluctant to part with
23 any of their roles, especially since the information and accumulated social capital can be used to

1 their own personal advantage (e.g., Keller and Holland 1975; Baroudi 1985; Katz et al. 1995). In
2 short, there is enough evidence from examples like NASA’s Columbia accident as well as from
3 academic studies to suggest that agents nominated into boundary spanning roles may fail to
4 perform these roles in practice.

5 To clarify this discrepancy, we introduce a distinction between *nominated boundary*
6 *spanners* and *boundary spanners-in-practice*². According to Bourdieu’s practice theory, through
7 the process of *nomination* (or “designation by name”), agents who occupy dominant positions in
8 a field, such as top leadership or KM groups in organizations, use the symbolic capital of their
9 own positions to appoint (name) themselves or others to various positions endowed with
10 symbolic capital (Bourdieu 1998: 51). Through this nomination, organizational leaders try to
11 foster the emergence of a new joint field across a particular boundary. Figure 1 illustrates the
12 lack of boundary spanning-in-practice when only nominated boundary spanners are present.

13 Formal structures such as roles, however, may not coincide with actual practice, which
14 involves diverse interests and in which actions (e.g., such as nomination) have unexpected
15 consequences (Wenger 1998: 80). In contrast to nominated boundary spanners, boundary
16 spanners-in-practice must actually engage in boundary spanning, that is, in relating practices in
17 one field to practices in another field by negotiating the meaning and terms of the relationship.
18 They engage in building a new joint field “in-between” the two fields. To understand the
19 emergence of an organizational competence in boundary spanning, we need to investigate how
20 agents become boundary spanners-in-practice by drawing on their nomination or, possibly,
21 independently from their expected roles. In other words, we need to understand how agents
22 actually develop and sustain a new joint field.

² This distinction was (inspired by the practice theory-based distinction between a technological artifact and a technology-in-practice Orlikowski 2000: 403).

Boundary Objects in Theory and in Use

1
2 Star and Griesemer (1989) introduced the concept of *boundary object* to address the
3 limitations implied by the reliance on boundary spanners who may promote self-interest, have a
4 limited social network, and face temporal and physical constraints. Examples of boundary
5 objects include physical prototypes (Carlile 2002; Bechky 2003), design drawings (Bødker
6 1998), use scenarios (Bødker 2000), engineering sketches (Henderson 1991; Bechky 1999),
7 accounting ledgers (Briers and Chua 2001), and standardized reporting forms (Star and
8 Griesemer 1989; Bowker and Star 1994; Bowker et al. 1996; Briers and Chua 2001). The term
9 “boundary object” thus refers to a broad range of artifacts that “are plastic enough to adapt to
10 local needs and constraints of the several parties employing them, yet robust enough to maintain
11 a common identity across sites” (Star 1989: 393). This concept is useful in understanding how
12 IT-based artifacts can support the development of a boundary spanning competence. The IS
13 literature provides many examples of boundary objects, from document archives to ERP systems
14 (Ackerman and Halverson 1999; Briers and Chua 2001; Pawlowski and Robey 2005).

15 Researchers in this tradition have focused more on practice-based studies of organizations
16 than their counterparts studying boundary spanners. They initially catalogued various boundary
17 objects and, later, investigated their properties such as modularity, abstraction, accommodation,
18 and standardization (Star 1989; Star and Griesemer 1989; Wenger 1998; Pawlowski and Robey
19 2005), as well as the purposes behind the use of different kinds of objects (Carlile 2002). Studies
20 suggest that boundary objects should be tangible (Carlile 1997), concrete (Henderson 1991;
21 Bechky 2003), accessible, and up-to-date (Carlile 1997).

22 Such lists of characteristics and aspirations behind artifacts are useful to identify boundary
23 objects in practice. Yet, they are not necessarily helpful to figure out how an organizational

1 competence in boundary spanning actually emerges from the use of these objects. In many cases
2 objects that have been designated as useful for boundary spanning and that possess desired
3 characteristics remain unused or were used superficially (Levina 2001). There are many
4 examples of IS that were designated to support organizational members in spanning boundaries,
5 but that were eventually used in practice to guard and reinforce these boundaries (Goodman and
6 Darr 1998; Schultze and Boland 2000; Newell et al. 2001).

7 Drawing on recent theorizing about artifacts in practice, we argue that it is impossible to tell
8 whether an artifact would acquire a common identity or would satisfy varied local needs outside
9 its use, because outside its use an artifact does not have any meaning or structural property
10 (Orlikowski 2000). Recent practice-based accounts of boundary objects have supported our
11 claim that boundary objects' characteristics and performances are embedded in the situated
12 practices of the agents that use them (Carlile 2002; Bechky 2003), but they did not examine how
13 boundary objects emerge in practice. We, thus, distinguish between *designated boundary objects*
14 and *boundary objects-in-use*. In a way that is similar to nominating boundary spanners, agents
15 who hold positions of power in a field designate certain objects as valuable for accomplishing
16 boundary spanning in practice. They do so by using their own symbolic capital to name an
17 artifact as symbolically valuable. These designated boundary objects may not, however, become
18 boundary objects-in-use: they may not be usefully deployed in the practices of each field
19 involved, nor have a common identity in their use across fields (following Star's 1989 original
20 definition). Artifacts that become boundary objects-in-use become both locally useful (they are
21 meaningfully and usefully integrated into local practices) and acquire a joint identity across
22 fields. A joint identity in this case refers to having a structure that "*is common enough to more*
23 *than one world to make them recognizable*" (Star and Griesemer 1989: 393). In practice theory

1 terms, “*common identity*” refers to the association of some symbolic capital (particular value)
 2 with the boundary object, which can only happen in the context of a joint practice. Thus, the
 3 development and use of boundary objects-in-use must be situated in a new joint field.

4 We summarize the differences between the nominated boundary spanners and designated
 5 boundary objects and boundary spanners-in-practice and boundary objects-in-use in Table 1.

6 **Table 1: Comparing Nomination/Designation and Enactment in Boundary Spanning**

Nomination and Designation	Enactment
Nominated Boundary Spanners: Refers to agents who were assigned by the empowered agents in a field to perform certain roles in spanning boundaries of diverse fields.	Boundary Spanners-in-Practice: Refers to agents who, with or without nomination, engage in spanning (navigating and negotiation) boundaries separating fields.
Designated Boundary Objects: Refers to artifacts, that, due to their design and properties, were named as valuable in spanning boundaries of diverse fields.	Boundary objects-in-use: Refers to artifacts that, with or without designation, become usefully deployed in the practices of diverse fields and acquire a joint identity in practice

7 The distinction between the four concepts depicted in Table 1 helps us see the difference
 8 between boundary spanning in theory and boundary spanning in practice and moves us closer to
 9 understanding how an enacted competence in spanning the boundaries of particular fields
 10 emerges. The purpose of our fieldwork and data analysis was to understand the dynamics
 11 through which agents and artifacts become boundary spanners-in-practice and boundary objects-
 12 in-use. Such an analysis helps us understand better why in certain cases IT-based artifacts
 13 become boundary objects-in-use, while in others they do not, and draw implications for IS
 14 implementation and use for supporting this kind of KM.

15 **METHODOLOGY**

16 The goal of our empirical approach was to use practice theory to interpret data from our
 17 cases and to understand the emergence of an organizational competence in boundary spanning,
 18 especially in the context of IT implementation and use. Prior works (Barley 1986; Orlikowski
 19 1992; Schultze and Boland 2000; Orlikowski 2002) have demonstrated such way of using

1 practice theory in data analysis. Because we wanted to study agents' production of practices as
2 well as their aspirations, our investigation relied on direct empirical observations of what people
3 did and on interviews with key participants regarding their intentions and perceptions of practice.

4 We compared two qualitative longitudinal case studies to address our research questions.
5 Cases were considered as specific instances of several fields-of-practice, following Bourdieu's
6 (1998: 2) guide for empirical research. To further our understanding of the phenomenon and to
7 address the questions that arose from the theoretical development, we used grounded theory
8 techniques (Glaser and Strauss 1967; Strauss and Corbin 1998). The conclusions presented in
9 this paper were based on the comparative analysis of practices involved in boundary spanning
10 within (longitudinal analysis) and across cases (cross-case analysis).

11 **Data Collection**

12 Each of us separately collected data on one of the cases. One case focused on the emergence
13 of practices supporting boundary spanning associated with the implementation of intranet
14 applications in an insurance company—Insura³. This case was well-suited for investigating
15 boundary spanning because the stated objective behind intranet implementation at Insura was to
16 improve “knowledge sharing” between Insura's headquarters and its geographically distributed
17 sales agents, as well as among sales agents. The other case focused on the emergence of practices
18 supporting boundary spanning in an inter-organizational IS development project conducted by an
19 Internet consulting firm, Eserve, and its client, Pubco. This case was also relevant for examining
20 the research questions because Eserve managers insisted that the strength of their organization
21 was in integrating diverse professional expertise (in strategy, technology, and graphic design) as
22 well as their clients' business expertise on project teams. Pubco, as a client, was chosen because

³ Names of organizations, their members, and specific practices are disguised

1 Pubco managers expressed an interest in improving communication with consultants. Eserve had
 2 also put in place an intranet-based KMS to facilitate boundary spanning among its professional
 3 groups and with clients. Both Insura and the Eserve-Pubco project granted us necessary access
 4 for conducting sustained on-site observations, interviews, and archival data analysis. Table 2
 5 outlines how each researcher independently collected data.

6 **Table 2: Cross-Study Comparison of Methods**

Methods	Insura	Eserve-Pubco
Field Observation	4 months, 3 days a week. Insura's headquarters and local teams.	9 months, 4-5 days a week. Mostly at Eserve, but some at Pubco.
Access to the field	Negotiated access through headquarters.	Negotiated access through Eserve.
Semi-structured interviews	31—recorded and transcribed.	41 (23—Pubco, 19—Eserve)—recorded and transcribed.
Informal contacts	Yes	Yes
Follow ups visits	Yes	Yes
Documents and Archives	Yes	Yes
Key Boundaries	1) Professionals in Departments at Headquarters—Sales Reps 2) Among Geographically Distributed Sales Teams	1) Consulting Firm—Business Clients 2) Requirements Team—Graphic Designers
Key Technologies	Email, Telephone, intranet	Email, Telephone, intranet
Other	- 3 focus groups of 5 sales reps - Statistics of use of the intranet	- Coding of email archives and records in Eserve's HR System

7
 8 **Longitudinal and Cross-Case Analyses**

9 The integration of ideas based on data from field studies conducted by researchers separately
 10 is somewhat unusual in the IS literature, but it has been fruitfully deployed for inductive theory
 11 development in organizational literature (e.g., Tyre and Orlikowski 1994; Staudenmayer et al.
 12 2002). This approach appealed to us because we shared the same sociological tradition (reflexive
 13 sociology as outlined in Bourdieu and Wacquant 1992) and unit of analysis—an organizational
 14 practice targeted at boundary spanning—when we performed separate data collection and
 15 analysis, yet each of us emerged from the field with a different understanding of key concepts:
 16 One of us concluded that the nomination of people to boundary spanners' roles created only
 17 obstacles in practice, while the other one observed how a nominated boundary spanner was

1 crucial in fostering the emergence of a boundary spanning competence. By going back to our
2 notes and interviews we developed a common viewpoint that illuminated observations in both
3 settings. The steps we have taken are described below.

4 First, each of us went through our qualitative data to write individual case descriptions, based
5 on interlinked stages of data reduction and interpretation (Agar 1980; Becker 1998). This process
6 resulted in a series of gradually refined monographs (Pettigrew 1990) that constituted our
7 independent interpretations of data—"boundary spanning stories." Next, using a comparative
8 method, we contrasted our stories within and across sites (Glaser and Strauss 1967). The contrast
9 between the two cases helped each of us practice the "radical doubt" (Bourdieu and Wacquant
10 1992: 235) or "suspicion" (Klein and Myers 1999): we challenged each other's conclusions and
11 looked for confirming and discomfiting evidence to support or reject our emergent
12 explanations. Next, we identified noticeable intentional and emergent shifts in practices over
13 time within each case—new stages. For example, in the Insura case, we identified a new stage of
14 IS implementation based on a significant increase in the system's usage. The factors defining
15 each stage were then contrasted within and across cases. Through this analysis, we developed the
16 notion of a new joint field. We could then explain key differences in the cases by distinguishing
17 between nominated boundary spanners and agents who actually engaged in building new joint
18 fields as well as between designated boundary objects and objects that were actually used for
19 boundary spanning. Then we went back and re-interpreted the data using these new concepts.
20 After the inductive analysis, we used the theory and literature on KM as an additional lens to re-
21 interpret our findings, as suggested by Glaser and Strauss (1967).

1 **BOUNDARY SPANNING-IN-PRACTICE: TWO CASES**

2 We identified three stages in the evolution of each case based on shifts in boundary spanning
3 practices. Each case description is presented separately and followed by an analytical summary.

4 **Insura Case: How the Implementation and Use of Intranet Applications** 5 **Helped Develop a New Boundary Spanning Competence**

6 Insura was an autonomous arm of a French insurance company that sold financial services to
7 households. Insura's four thousand employees worked in the headquarters or in local sales teams.
8 Four hundred people at headquarters created new and updated existing financial services as well
9 as the company's marketing strategy. Sales agents worked in local teams of about twenty sales
10 agents and one sales manager each. A substantial part of the sales agents' work consisted of
11 scheduling and preparing visits using clients' files, information on services and markets, and
12 each team's marketing and advertising strategies. When a new sale had been contracted, agents
13 keyed their sales information into the reporting system on their laptops to validate the deal.
14 Subsequently, the HR department issued them paychecks. As their tasks were geographically
15 spread out, sales agents from different teams did not have the opportunity to interact directly.

16 Traditionally, there was a lack of mutual understanding between local teams and people at
17 headquarters. Members of headquarters complained that, while their work was directed at
18 helping sales agents, sales agents did not value the tools they provided. For instance, members of
19 the marketing department created posters advertising new products. They also visited a few local
20 offices to advocate the use of these posters. Yet, they were aware that these posters were not
21 integrated into sales practices. The following excerpt from field notes illustrates this point:

22 Marie works in the marketing department. She shows her peers her new promotional poster. As
23 her colleagues congratulate her on the poster, she comments, ironically: "*Well, yes, it [the poster]*
24 *is good. Too bad they [i.e., sales agents] will not have the same opinion about it. And next week,*
25 *I have to go defend the poster. I will be lucky if they do not throw tomatoes at me!*"
26

1 Members of local teams, on the other hand, maintained that headquarters' policies and
2 recommendations were not suitable for the realities of their trade. They argued that the posters
3 provided by headquarters were too "abstract" to be persuasive to clients. Members of local teams
4 created their own posters to address what they considered to be clients' specific needs.

5 **Stage 1: Limited Joint Field Production between Local Teams and Headquarters**

6 Insura's general manager wanted to foster relationships between local teams and
7 headquarters in order to improve Insura's overall performance. He decided to develop various
8 intranet-based applications that would be shared by headquarters and local teams. The general
9 manager nominated Dominique to lead the project and become the future webmaster. Dominique
10 had a unique background which combined twenty years of experience as a sales agent and as a
11 team manager as well as an IT specialist at the MIS department at headquarters in the last five
12 years. Assisted by a small team of IT professionals, Dominique designed and implemented
13 intranet applications in six months. During this period, he did not consult his former colleagues
14 in local teams about the project, but relied primarily on the input from marketing, HR, and legal
15 departments at headquarters.

16 Dominique explained: "*I did not ask local teams what they thought about the future intranet,*
17 *because I knew they would not think anything about it. So I designed the intranet in-house.*"
18

19 Implemented in December 1999, the intranet became available to all members of the
20 headquarters and local teams. It included applications such as an interface to the sales reporting
21 system, a personnel directory, and official documentation on services. In addition, a folder
22 entitled "commercial initiatives" allowed agents to share best practices. Sales agents could
23 access the intranet from their laptops or from their local offices.

24 During the first six months of its availability, however, sales agents hardly used the intranet
25 for anything but the interface to the sales reporting system. Agents' lack of competence with the

1 technology partially accounted for their limited use. More importantly, however, sales agents
2 seldom used the intranet because they considered that headquarters had created the applications
3 without considering their practices.

4 A sales agent: *“Why use the intranet? There is nothing much in it that is of real use to what is*
5 *truly important to me, that is to say, dealing with clients on a daily basis. It’s incredible, we are*
6 *working for the whole Insura, but they [at headquarters] do not seem to be aware of it.”*
7

8 This statement was typical of sales agents’ opinion that headquarters were not providing
9 useful tools for them and did not acknowledge the value of sales agents’ hard work.

10 **Stage 2: The Nominated Boundary Spanner Becomes a Boundary Spanner-in-Practice**

11 By accessing web logs, Dominique soon learned that sales agents seldom used the intranet.
12 He decided to take action and embarked on what he called his “Tour de France,” which consisted
13 of visiting about 40 local teams. During visits, he presented the project, explained how to use the
14 intranet, and received direct feedback from agents. Visits were well received and stories about
15 them were gradually shared with other teams by word of mouth. With Dominique’s visits, sales
16 agents perceived that members of headquarters paid attention to their practices and provided
17 tools that could concretely help them in their work. A sales agent commented:

18 *“The intranet (...) was launched by [headquarters] and it really shows that they care*
19 *about how we deal with clients.”*

20 Moreover, as Dominique talked to sales agents, he learned ways of improving the intranet’s
21 functionality and applications. Sales agents talked freely to Dominique because they considered
22 him to be “one of them” as his former fame as a successful sales agent was still fresh in people’s
23 minds. Sales agents told Dominique that the intranet did not provide them with specific answers
24 to some of their daily concerns. Dominique then introduced a new “Frequently Asked Questions”
25 (FAQ) application that agents could use to ask questions (related to new services, HR, or legal
26 matters) and to get focused answers from headquarters. The heads of the concerned
27 departments—marketing, HR, and legal affairs—and Dominique jointly assigned six

1 headquarters' members to answer these questions as part of their jobs. Moreover, during this
2 period, Dominique asked—mostly through e-mail and phone calls—some of the sales agents who
3 used to be his closest colleagues from various local teams to contribute to the “commercial
4 initiatives” folder by sharing some of their best practices. To encourage contributions,
5 Dominique also created a link from this folder to the intranet homepage that showed pictures of
6 the contributing agents.

7 **Stage 3: Intranet Applications Become Boundary Objects-in-Use and Their Use**
8 **Encouraged the Emergence of New Boundary Spanners-in-Practice**

9 From late fall 2000, Dominique had returned to the company headquarters and had scaled
10 down his direct involvement in the relationships between local teams and headquarters. Sales
11 agents and members of headquarters made substantial and active use of the FAQ applications.
12 Members of local teams used the FAQ to ask questions that really mattered to them. The
13 designated members of headquarters responded to these questions by following two rules that
14 Dominique had decreed: 1) the answer had to be short (two paragraphs) and, 2) the answer had to
15 be put online within twenty-four hours, which forced members of headquarters to take into
16 account sales agents' needs for straightforward and fast answers.

17 Moreover, sales agents started putting their best practices online in the “commercial
18 initiatives” folder. Traditionally, among sales agents, the “best” professionals were considered to
19 be the ones who were the most successful at selling financial services, as identified by the sales
20 volume rankings published in a newsletter. When the intranet commercial initiatives feature
21 became available, at first, sales agents remained reluctant to share their best practices with
22 colleagues through the intranet, as they considered that contributing would equate to giving away

1 their source of competitiveness. After Dominique contacted his ex-colleagues and recognized
2 contributions through pictures, initial contributors gained immediate publicity:

3 Sales agent: *“The ‘commercial initiatives’ folder, for sure, I use very often. Just to tell*
4 *you, there was a colleague of mine who has posted a way of treating new clients. You*
5 *can see his picture on the site! This is fame! More seriously, it is very useful, because*
6 *one has the occasion of knowing what the others do. Others that we do not know but*
7 *who deal with the same issues as we do. Before the intranet, we did not do that.”*
8

9 Sales agents became gradually more willing to contribute to the folder. Dominique received
10 potential contributions via e-mail, and usually contacted the author to add details about the story
11 (e.g., the methods for identifying prospects) or to get rid of unnecessary details (e.g., names of
12 clients) before posting them online. Now being a good professional *at Insura* included not only
13 being able to sell a lot of contracts, but also contributing to the commercial initiatives folder.

14 **Analytical Summary**

15 Insura as a whole constituted a field that engaged agents in practices through which they
16 related various species of cultural capital produced by diverse professional fields (e.g., HR, legal,
17 finance, sales, and marketing) to produce a unique organizational competence in developing and
18 delivering financial products to consumers. Sales agents also belonged to the field of
19 professional sales practice which produced a unique cultural capital—a competence in selling
20 products. The headquarters’ leadership within the Insura field held the power of “nominating”
21 agents to specific officially acknowledged roles.

22 The first stage of the case revealed limited boundary spanning in practice. Headquarters’
23 marketing agents were nominated boundary spanners, but were not boundary spanners-in-
24 practice. They engaged in the practices of their own professional field, but were not engaged in
25 negotiating the meaning and terms of the relationship of their field to that of sales agents’. Not
26 surprisingly, the posters that they produced remained merely designated boundary objects.

1 Insura's general manager then nominated Dominique to develop intranet-based applications as
2 boundary objects between local teams and various departments at Headquarters. During the
3 development and the first six months upon launch, Dominique remained a nominated boundary
4 spanner and various intranet applications, designated boundary objects. Sales agents' limited use
5 of these applications reinforced the boundary between sales agents and headquarters.

6 Dominique became concerned by this situation as it threatened the symbolic capital he had
7 acquired through his nomination as a boundary spanner. He then changed his actions to become a
8 boundary spanner-in-practice. During his "Tour de France", he engaged in relating what sales
9 agents were interested in obtaining and producing (their capital and practices), to the capital and
10 practices of agents at headquarters. Dominique then designed and modified various objects
11 (applications such as the FAQ folders) that started acquiring a joint identity in the Insura field as
12 objects representing the relation between sales agents and headquarters' agents. These objects
13 became boundary objects-in-use for agents in local teams and agents in the headquarters.

14 During the third stage, Dominique reduced his active engagement in the newly established
15 joint field. The specific contents of the FAQ applications became useful in the context of the
16 practices in local teams and in the headquarters' departments. Moreover, through use, a common
17 identity of the FAQ application emerged as that of signifying the relation between sales agents as
18 advice seekers and various headquarters agents as advice givers. As Dominique scaled down his
19 involvement in this practice, FAQ contributors and users started taking on more or less active
20 roles in negotiating and sustaining the joint field.

21 Similarly, a new joint field emerged surrounding the use of the commercial initiatives folder.
22 Here, the joint field was a sub-field of the sales agents' professional field rather than the Insura
23 field and involved spanning boundaries of various geographically distributed socio-economic

1 fields in which local sales agents' practices were embedded. Dominique used his symbolic
2 capital as a boundary spanner to encourage the production of a new joint field by giving
3 symbolic recognition to those agents who contributed to building the practice. He also used his
4 social capital to mobilize participation. The commercial initiatives folder became for agents who
5 could learn from others how to improve their practice and accumulate professional capital. The
6 folder also acquired a common identity signifying the relationship among geographically
7 distributed economic fields as that of partial collaboration rather than strict competition.

8 **Eserve-Pubco Case: How Project Management Structures Inhibited Boundary**

9 **Spanning- in-Practice and Limited IT Use**

10 Eserve was a young, successful, and rapidly growing professional services firm engaged in
11 the production of Business-to-Consumer (B2C) applications. Although there were no formal
12 titles at Eserve, project teams comprised of an client partner, a project manager (PM), and
13 strategy, graphic design, and technology consultants who defined, designed, and built the system.
14 Projects generally went through three phases—Planning, Prototyping, and Development.
15 Eserve's service delivery model and other practices emphasized that clients knew little about
16 "the web space" and needed to be heavily guided by innovative, young consultants. On the other
17 hand, Eserve leadership put great emphasis on building a strong collaborative culture among
18 consultants and, to this end, implemented a state of the art intranet-based KMS system (E-share),
19 which included, among other things, a repository of consulting tools as well a separate project
20 space for each project participant to share their work-in-progress and completed documents.

21 Pubco was a division of a well-established publishing company, with headquarters located
22 within a thirty-minute walk from Eserve offices. Pubco relied on strong hierarchical and
23 departmental distinctions Historically, Pubco was cautious in dealing with consultants, but, in

1 fall 1999, Pubco's executives decided to hire a consulting firm to revamp their current web site
2 and boost their e-brand. Pubco's executives argued that Pubco lacked advanced web
3 development and strategy expertise and that consultant could help prioritize and integrate various
4 grassroots web initiatives that were developed at Pubco in the last five years. It was agreed that
5 the project would be conducted in close collaboration between Eservers (the consultants) and
6 Pubco employees (the clients).

7 **Stage I: Too Many Nominated Boundary Spanners: No Boundary Spanners-in-Practice**

8 The key objective of the Planning phase of the project was the determination of a business
9 vision for the website. Frank, a seasoned Eserve strategy consultant, became the project's client
10 partner. Frank usually explained that the definition of his role was to represent the client's needs
11 to the Eserve team, but he invariably added, "I will always represent [Eserve] team's needs."

12 In the initial weeks of the project, Pubco participants struggled to understand Eserve's
13 approach to the project. It was up to Frank to educate Pubco participants, but in his explanations
14 Frank relied heavily on what Eservers themselves referred to as "consulting speak." In addition,
15 Frank was often unavailable, due to multiple business obligations. Bob, Eserve's PM, who was
16 new to Eserve and not yet accustomed to its methods, was the other manager who interfaced with
17 clients. His role expectations included coordination of the work of the team and coordination
18 with clients on specific tasks. Bob, however, considered Pubco a slow-moving bureaucratic
19 organization, not suited for the Internet age, and gave little credit to clients' opinions.

20 Simultaneously, Eservers were trying to learn about Pubco's business through Pubco's
21 project coordinator Maya, who was entirely devoted to the project. Maya had no previous
22 experience with the web, but she was a natural choice for a project coordinator because she was a
23 professional consultant who had been involved with Pubco for several years, analyzing its

1 marketing strategy, which was of direct relevance to the Eserve-Pubco project. Pubco's
2 executive said: "We felt we needed a consultant type to round out our team". In addition, to
3 Maya, a VP-level project sponsor was involved in the relationship, but he lacked domain
4 expertise and still had to perform his everyday job at Pubco.

5 Yet, the relationship between Maya and Eservers did not work out, to a large degree because
6 Maya initially tried to act "too much like Eservers." This was not acceptable to Eservers because
7 she "did not know the web space." Disrespect for Maya grew so far as to be openly expressed
8 during Eserve-Pubco joint meetings. Behind closed doors, Eservers referred to her as "the Queen
9 of Darkness". Initially, Maya tried to help Eserve communicate with Pubco in terms that Pubco
10 would understand. She provided paper-based versions of documents like Pubco's strategic plan
11 and market analysis. Frank and Bob, however, discounted these documents as "useless pieces of
12 paper" without passing them on to line consultants. Maya also advised Eserve on how to
13 approach the project in "a Pubco way." Eservers complained that Maya tried to impose things on
14 them that did not make sense. At this time, Maya started collecting complaints from Pubco's
15 participants about Eserve's processes and delivering them to Eserve's top management.

16 Tensions among the managers on the project grew while Eserve's and Pubco's team
17 members continued to rely on the managers to learn about each other's practices and concerns.
18 Although Eserve made promises that Pubco people would be able to contribute and access
19 project documents through E-share, the Eserve's PM and client partner argued that a firewall
20 prevented them from granting Pubco access to the system. This kind of problem, however, had
21 been resolved in the past (and was resolved in the next phase of this project). Moreover, until it
22 became clear that clients would not be able to access E-share, consultants were advised to share
23 their work-in-progress through internal email rather than through E-share. Despite email and

1 telephone availability in both firms, small face-to-face group meetings among the managers were
2 the primary mode for issue discussion and decision-making. There were also several scheduled
3 workshops in which all project members participated.

4 Pubco participants viewed the relationship as dysfunctional and feared that their interests
5 would be compromised if they left it up to Eservers to analyze potential web site initiatives.
6 Pubco team members, therefore, came up with top priority initiatives and passed them on to
7 Eserve in a “must have” list. Eservers were not convinced of the strategic value of these
8 initiatives, but interpreted the list as sign of Pubco’s insistence on gaining full control over the
9 intellectual substance of the project. With Pubco threatening to withdraw funding for the next
10 phase, they recommended these initiatives as the *best* strategy for the new website.

11 **Stage II: The Emergence of Boundary Objects-in-Use and Boundary Spanners-in-Practice** 12 **and the Obstacles Created by Nominated Boundary Spanners**

13 The relationship started slowly mending when line consultants began engaging directly with
14 line Pubco’s members upon the acceptance of the “must have” list. With the most contentious
15 issue out of the way, two junior Eserve strategy consultants started interacting directly with three
16 of Pubco’s team members in face-to-face meetings, further detailing the selected initiatives. This
17 direct relationship became formalized in the Prototyping phase of the project when the work was
18 broken down so that clients and consultants worked together in the “requirements,” “technical,”
19 and “design” sub-teams. Members of the requirements sub-team met frequently and created
20 requirements called “Pubco’s Use Cases.” Eserve’s strategists produced initial documents based
21 on their market research and insight (e.g., what makes Amazon.com effective), Eserve’s Use
22 Case templates stored in E-share, and Pubco’s current web site. Then members from both

1 organizations discussed the documents in meetings. Through this interaction, they started
2 learning each other's business language and practical concerns.

3 The hierarchical project management structure, however, was still reinforced on the project
4 with Maya and Eserve's new project manager Wendy, who replaced Bob, attending every
5 meeting. Maya and Frank, at this point stopped following the details of the work, yet Maya
6 insisted that any significant issue had to be resolved through meetings among project leaders.

7 Meanwhile, through interactions of the requirements team, Eserve consultants became deeply
8 concerned about the strategic value of the initiatives that they recommended. Risking their own
9 careers, they approached Pubco's requirement team members with whom they had developed a
10 good working relationship, and raised their concerns. Pubco participants, however, reported this
11 interaction to Maya according to the established process for resolving significant issues. Maya
12 reprimanded consultants for going outside established ranks.

13 The very same Pubco team member who elevated the issue to Maya: *Something*
14 *happened in the communication from our core group to [Maya] and [John] back over to*
15 *[Eserve]. I think that if there were less process, or it was less formal without having*
16 *these leaders and project leaders and bearing everything through them, that in all cases*
17 *early on that were difficult in communication, we would not have had those problems.*
18

19 **Stage III: Emergent New Joint field Marginalizes Non-spanners**

20 With the designation of the requirements, technology, and design sub-teams, communication
21 among different professionals *within* the Eserve team on key project issues became less frequent.
22 Increased email and face-to-face communication between Eserve and Pubco took place primarily
23 within these sub-teams; only major completed pieces of work were now posted in E-share.

24 Once Use Cases were finalized, they were placed in E-share and printed for graphic
25 designers to develop designs for the website. The graphic designers, who mostly entered the
26 project during the Prototyping phase and were not interfacing with clients much, lacked an

1 understanding of Pubco’s business practices and terminology. They did not know how to utilize
2 Use Cases or, if necessary, suggest changes to them.

3 Eserve designer commented: *I was looking at them [Use Cases] but I could not*
4 *understand them. I would read through them, but it seemed like they were not making*
5 *sense, and it just kept on ...They [requirements sub-team] were sending out a lot of*
6 *documents.*

7
8 For several weeks, designers who received Use Cases did not use them, sometimes throwing
9 the documents into the trashcan. Work on the site design stagnated and strategists blamed the
10 designers for their lack of contributions. All designers were re-assigned to other projects after the
11 Prototyping phase—a loss to their careers since they could no longer include Pubco’s website in
12 their portfolios. Yet, Eserve strategists’ careers got a big boost at Eserve after this project.

13 **Analytical Overview**

14 Eserve and Pubco constituted fields, much like Insura, each engaged in the production of a
15 specific cultural capital using and transforming species of cultural capital produced in various
16 professional fields. Simultaneously, Eserve and Pubco also held institutionalized positions within
17 the larger field of the consulting practice, which contributed to the development of antagonistic
18 expectations between their respective members. During the first stage of the project, Eserve and
19 Pubco had each nominated two agents as boundary spanners, but none of these four agents
20 actually became a boundary spanner-in-practice. The four nominated boundary spanners
21 remained unable or unwilling to use various designated boundary objects (e.g., the strategic plan,
22 market research document, “must have” list) in a way that related practices of the two fields. In
23 addition, they limited others’ direct use of IT (email or KMS) and, hence, prevented the
24 emergence of alternative boundary spanners-in-practice.

25 In the second stage of the project, nominated boundary spanners allowed direct
26 communication among line consultants and Pubco members on smaller scale issues. Eserve

1 strategy consultants were the first to emerge as boundary spanners-in-practice: they started
2 reflecting upon objects produced in various fields (e.g., strategy group within Pubco produced
3 the strategic plan and KMS group within Eserve produced an archive of Use Case templates) and
4 negotiating the relationship between the fields by creating and using new objects such as Pubco's
5 Use Cases. Pubco's Use Cases became boundary objects-in-use and were used and co-produced in
6 the new joint field (constituted by the members of the requirements team). In the new joint field,
7 a common identity for Pubco's Use Cases emerged which signified that Eservers would draw on
8 their expertise (cultural capital) in the wider web space, while Pubco would draw on their
9 expertise in the publishing business. The symbolic capital associated with the participation in this
10 joint field, however, had limited value within Pubco as Maya used the symbolic capital of her
11 role as a nominated boundary spanner to preserve her privileged position and limit boundary
12 spanners-in-practice ability to fully engage in practices in both fields.

13 In the third stage, boundaries among professional fields within Eserve were re-enforced
14 through practice. Eserve strategists as well as Wendy had become boundary spanners-in-practice
15 for the boundary between Eserve's and Pubco's fields thereby distinguishing designers as "non-
16 spanners." Use Cases were thus boundary objects-in-use between Eserve and Pubco but
17 remained designated boundary objects among Eserve's sub-teams. This had different impacts on
18 the respective careers of Eserve's strategists as opposed to designers.

19

20

DISCUSSION

21 In this section, after contrasting the two cases, we examine how agents become boundary
22 spanners-in-practice and how artifacts become boundary objects-in-use. In line with Bourdieu's
23 theory of practice, our discussion stresses the dilemmas and conflicts experienced by agents who

1 occupy various positions in multiple fields and are expected to perform different roles in diverse
 2 fields.

3 **The Emergence of New Joint Fields: Cross-Case Comparison**

4 A cross-case comparison reveals key differences in settings summarized in Table 3.

5 **Table 3: Comparing the main dimensions of the two cases**

Dimensions of analysis	Insura case	Eserve-Pubco case
Boundaries	HQ Departments/Local teams. Among Local Teams	Eserve/Pubco Eserve Strategists vs. Designers
Material context of practice	Geographically Distributed	Co-located or located at close distance
Stages in boundary spanning in practice	<i>Stage 1:</i> no joint field <i>Stage 2:</i> two new joint fields emerge <i>Stage 3:</i> New agents engage in the production of the new joint field	<i>Stage 1:</i> no joint field <i>Stage 2:</i> a new joint field emerges <i>Stage 3:</i> a few select agents are engaged in the production of the new joint field
Emergence of a joint field	Two new joint fields emerges distinguishing those who do and those who do not contribute to the FAQ and commercial initiatives folders respectively.	A new joint field emerges distinguishing Eserve agents who understand Pubco's business and Pubco's agents who understand Eserve's business and those who do not
Nominated Boundary spanners	Marketing agents from headquarters. Dominique, the webmaster.	Frank, Bob, Maya, and Pubco's VP, and later Wendy.
Boundary spanners-in-practice	Dominique, in the 2 nd and 3 rd stages. Some sales agents and members of headquarters, in the 3 rd stage.	Eserve's and Pubco's members of the requirements team including Wendy.
Designated-boundary objects	Paper-based posters and newsletters, homepage, occupational documentation on the intranet.	Pubco strategic plan, Eserve's Use Case templates, and "must have" list shared in person.
Boundary objects-in-use	Intranet-based FAQ and "commercial initiatives" folder.	Pubco's Use Cases shared in meetings, email, and through E-share.
IT use practices	<i>Stage 1:</i> Limited use. <i>Stage 2:</i> A boundary spanner-in-practice creates and shares objects using the intranet <i>Stage 3:</i> The development of the joint field through the use of objects on the intranet.	<i>Stage 1:</i> Not used <i>Stage 2:</i> Boundary spanners-in-practice create and share objects using an e-mail list. <i>Stage 3:</i> Boundary spanners-in-practice create and share objects using email and E-share intranet.

6
 7 In addition to differences noted in Table 3, some key difference had to do with the relation of the
 8 new joint field to other fields in the setting. In the Insura case, the new joint field surrounding the
 9 FAQ use was a sub-field of an organizational field of Insura and the new joint field surrounding
 10 the commercial initiatives folder use was a sub-field of the sales agents' professional field. In the

1 Eserve-Pubco case, the new joint field was situated in the field of management consulting
2 practice. From prior literature, we know that it is possible that new joint fields become sub-fields
3 of other kinds of fields such as the field of labor negotiation (Friedman and Podolny 1992).

4 Despite these differences, we identified a conceptually similar scenario of emergence of new
5 joint fields in both cases. A critical aspect of this emergence is that boundary spanners-in-
6 practice engage in producing new kinds of practices in each setting. By producing these practices
7 they and other agents from diverse fields develop an interest in pursuing unique new stakes
8 involved in relating practices produced in diverse fields. As part of the negotiation of the
9 relationship between diverse fields, involved agents become willing to change the way they
10 practice in their local fields so as to participate in the new joint field (e.g., Insura’s sales agents
11 contributing and reading FAQs or commercial initiatives folders’ postings). The new joint field
12 helps agents develop a new distinction (*identity* according to Wenger 1998) as “participants in
13 these new joint fields” (e.g., as a member of Eserve-Pubco requirements team). Figure 2
14 demonstrates the emergence of a new joint field. By engaging in this new joint field, agents both
15 draw on organizations’ competence in boundary spanning and contribute to its development.

16 **Becoming a Boundary Spanner-in-Practice**

17 In the two cases, a significant number of agents were nominated to perform different
18 boundary spanning roles (a solution advocated by Friedman and Podolny 1992), but only a few
19 of them became boundary spanners-in-practice. Based on practice theory and on our data
20 analysis, we found three necessary, but not necessarily sufficient, conditions for an agent to
21 *become* a boundary spanner-in-practice.

Necessary conditions

1
2 In order to become a boundary spanner in practice, an agent must develop an interest (*ability*
3 *and inclination*) in negotiating relationships between fields. The first two necessary conditions
4 we outline relate to developing an ability to span boundaries, while the second one has to do with
5 having an inclination to do so. No set of conditions can be sufficient, though, because becoming
6 a boundary spanner-in-practice involves developing a practice that involves other agents and
7 associated unforeseen consequences of actions.

8 First, becoming a boundary spanner-in-practice requires becoming a *legitimate*, but possibly
9 *peripheral, participant* in the practices of both fields. Because boundary spanning requires an
10 ability to negotiate the relationship between the involved practices, it requires the development
11 of an at least peripheral understanding of each practice. Drawing on Lave and Wenger (1991), a
12 legitimate peripheral participant (LPP) gains access to the practices and artifacts of a field
13 (legitimacy) and takes stakes in the field and in the reproduction of its practices (participation).
14 This is not an easy condition to satisfy as it involves perturbing relations of power within settings
15 and serving “as a source of power or powerlessness, in affording or preventing articulation and
16 interchange among settings” (Lave and Wenger 1991: 36). Thus, to become LPP, agents may
17 need to draw on their economic, cultural, social, and symbolic capital. For example, as Eservers
18 guarded the boundary of their field very diligently, Maya did not have enough symbolic capital
19 to become seen as *legitimate*, even peripheral, participant at Eserve. Eserve’s designers joined
20 the project late and did not have enough economic capital (time) to participate in Pubco’s
21 practice. On the other hand, Dominique used his cultural capital (the understanding of sales
22 agents’ practices), economic capital (time and money to take “Tour de France”), social capital

1 (his contacts with the sales network), and symbolic capital (his old fame as a prominent sales
2 agent) to become LPP in sales agents' field.

3 Second, on top of being LPP in both fields, boundary spanners-in-practice must have
4 legitimacy not only as participants, but also as *negotiators* on behalf of others in a field. For
5 example, at first, Eserve's strategy consultants, even upon becoming LPP in both fields, did not
6 have enough legitimacy as negotiators of the relationship due to their junior status at Eserve.
7 Dominique, on the other hand, used the symbolic capital of his webmaster's position to gain such
8 legitimacy within the fields that he spanned. It is not necessary for these agents to be full
9 participants in both fields to gain the legitimacy as negotiators as such legitimacy can come
10 through nomination or evolve through object use, for example.

11 Third, agents engage in boundary spanning because they develop an inclination to do so.
12 This inclination may be based on perceiving greater advantages within their organizational or
13 professional fields from spanning a given boundary than from not doing so. Frank, for instance,
14 articulated clearly that he had no inclination to represent Pubco's interests, as he felt he had a
15 strong interest in being seen as representing only Eserve's side. By contrast, Wendy and strategy
16 consultants were relative newcomers to Eserve. They did not have such strong stakes in their full
17 association with Eserve, and were more inclined to engage in spanning the boundary with Pubco.

18 **Investing in the New Joint Field**

19 As boundary spanners-in-practice engage in relating diverse fields, they become different
20 from others within these fields—they develop a distinction as “boundary spanners.” To
21 overcome the marginalization of this potentially negative distinction, boundary spanners-in-
22 practice develop an interest in separating their practices from the practices of others and
23 developing an “enclave” for themselves and others like them. They also start negotiating the

1 status of their distinction as a potential source of power in the larger fields to which they belong
2 —producing a capital. In this way, boundary spanners-in-practice start producing a new joint
3 field. For this field to be sustained, being seen as “boundary spanners” becomes a symbolic
4 capital that boundary spanners-in-practice can use for advancement. For instance, Eserve’s
5 strategists used their position as boundary spanners with Pubco to advance within Eserve and,
6 possibly later, within the profession (say, through good recommendations). Similarly, agents at
7 Insura who used *and* contributed to the “commercial initiatives” folder became seen as boundary
8 spanners and were symbolically recognized at Insura. Some of those who used the folder gained,
9 first, professional, and then, economic capital as sales agents. Finally, some professionals, such
10 as IS managers (Pawlowski and Robey 2005) like Dominique, actually develop a permanent
11 identity as boundary spanners among different fields. Building a joint field becomes fully aligned
12 with their interests in professional advancement.

13 **Emergence of Boundary Objects-in-Use**

14 Boundary objects-in-use were defined as acquiring both a local usefulness and a common
15 identity in practice. Below we outline certain conditions necessary for their emergence.

16 **Necessary Conditions**

17 Consistent with prior studies (Carlile 2002; Bechky 2003), we found that for artifacts to
18 acquire a local usefulness, agents must use and make sense of them in the context of each field.
19 For example, Pubco’s Use Cases were not used by designers and did not make sense to them.
20 From Bourdieu’s practice theory, we also consider what it takes for an artifact-in-use to acquire a
21 common identity. We view common identity as a shared symbolic capital – a way of naming or
22 referring to an object that makes it recognizable in practice. To develop this symbolic capital,
23 there must be a joint field in which agents jointly recognize and value the artifact. Thus, many

1 designated boundary objects that had acquired a local usefulness, such as Pubco’s “must have
2 list”, did not emerge as boundary objects until a joint field emerged.

3 **Boundary Spanners-in-Practice Producing and Using Boundary Objects-in-Use**

4 To establish local usefulness of boundary objects-in-use in each practice and to establish
5 their common identity as jointly recognized symbolic capital, we found that organizations rely on
6 boundary spanners-in-practice. Only the agents who are centrally engaged in the negotiation of
7 the relationship between practices and thus possess a significant amount of symbolic capital can
8 establish an object as symbolically valuable across contexts (Bourdieu 1998: 57) ⁴

9 We now turn to discussing how boundary spanners-in-practice engage in establishing and co-
10 producing boundary objects-in-use. First, boundary spanners-in-practice reflect on objects from
11 each field (which they accessed by being LPP) and interpret them in terms of their own practices
12 in the new joint field, thereby relating the objects to each other. For instance, Eserve strategists
13 reflected on the Use Case templates they found in E-share and on Pubco’s old website and tried
14 to understand the relationship between the two.

15 Second, upon reflection, boundary spanners-in-practice create new artifacts (or adopt
16 existing artifacts) and establish a new identity for these artifacts in the context of a new joint
17 field. For instance, Dominique reflected on sales agent’s feedback about the Intranet as well as
18 on documents produced at headquarters to design the FAQ applications that signified the
19 relationship between agents at headquarters as advice givers and sales agents as advice seekers.

20 Third, boundary spanners-in-practice use various species of capital that they accumulated to
21 establish the local usefulness and negotiate the symbolic value of the artifacts that they promote

⁴ To be clear, this is not to say that every relationship has to be symbolically represented through the use of an artifact (Bourdieu 1977: 183-197); nor that a boundary spanner must continue being involved in the joint practice and negotiate the joint meaning of the artifact. We discuss situations in which this needs or does not need to happen elsewhere [Reference Suppressed].

1 as boundary objects. Dominique masterfully used various species of capital that he accumulated
2 to do so for various Intranet applications. He used his symbolic capital to obtain economic
3 capital from department heads at headquarters to assign agents to answer questions posted in the
4 FAQ folders. He also used his social capital (old contacts); cultural capital in the MIS field
5 (knowing how to build an FAQ application), cultural capital in the professional field (knowing
6 sales agents' work practices), cultural capital in the Insura field (knowing that Insura wanted
7 sales agents to use certain information from headquarters); and various types of symbolic capital
8 (as a webmaster in the Insura field and as a distinguished sales agent in the professional sales
9 field) to prove usefulness and stimulate contributions to the commercial initiatives folder.
10 Finally, as artifacts emerge as boundary objects-in-practice, boundary spanners-in-use use them
11 to further signify their positions in the new joint fields and the position of their field vis-à-vis
12 other fields. Eserve strategists used Pubco's Use Cases for this purpose.

13 **Tensions in Building Organizational Competencies in Boundary Spanning**

14 In line with practice theorizing, we now illuminate key tensions that are inherent in the
15 emergence of the new joint practice and the associated organizational competence in boundary
16 spanning. We highlight four types of tensions: 1) between the acts of nomination and designation
17 and the practical enactments; 2) between agents' investing in attaining stakes in local fields
18 versus attaining stakes in new joint fields; 3) between growing or restricting the growth of the
19 joint field; and 4) between organizational investments in developing competencies in spanning
20 one vs. another type of boundary.

21 We have started by distinguishing between boundary spanning in theory and in practice. We
22 found that *the acts of nomination and designation by agents empowered in organizational fields*
23 *are neither sufficient, nor necessary for the intended practices to emerge; rather, they serve a*

1 *kind of “mediating” role in practice.* On the one hand, having the symbolic capital associated
2 with the nominated role helps agents who are interested in spanning boundaries in practice to
3 foster the emergence of a new joint field as it helps them access local fields, obtain other
4 necessary resources, and be seen as legitimate negotiators. On the other hand, owning this
5 symbolic capital also helps those agents who decide not to take stakes in developing a new joint
6 field to prevent others from doing so. Such agents use their symbolic capital to contest the
7 legitimacy of others who want to engage in boundary spanning or to deny them access to local
8 practices. A similar situation is observed with designated boundary objects, which are
9 conceptually similar to the roles of nominated boundary spanners. The ownership of the
10 symbolic value associated with these objects is used to either foster or inhibit the emergence of
11 new joint fields (e.g., Pubco’s strategic plan vs. Insura’s commercial initiatives folder).

12 The second tension involved in this emergence is experienced by agents who are or consider
13 engaging in the joint field. On one hand, engaging in such practice may help agents advance in
14 their “local” fields if the capital associated with their engagement in the joint field can be
15 converted into something of value in their local fields. On the other hand, engaging, especially
16 fully, in the joint field, like investing in a start-up company, requires using one’s capital. This
17 capital could be usefully applied to advance in local fields. Moreover, accumulating the new kind
18 of capital in a joint field may be highly risky: agents may lose it entirely if the joint field
19 becomes stigmatized in the fields being spanned. If Eserve-Pubco project had been declared a
20 failure, requirements team members would risk losing their accumulated capital. A professional
21 who invests in building organizational competence in boundary spanning as opposed to in their
22 own professional competence may be making a firm-specific investment (Lepak and Snell 1999).
23 There are professions (like IS management) for which these two investments are not in conflict.

1 Beyond these “classical” considerations, there is a third, related, tension faced by boundary
2 spanners-in-practice. On one hand they have an interest in growing the practice and encouraging
3 others to engage in co-defining and using boundary objects so as to get symbolically recognized
4 in the organizational field for their efforts in spreading a valuable practice as well as to develop a
5 possibly permanent distinction. Thus, Dominique involved several other agents in the
6 development of the Intranet and took credit for the spread of Intranet use at Insura. On the other
7 hand, as more agents start engaging in the new joint field and start taking credit for evolving it,
8 participation in the joint field may stop serving as a valuable distinction. As these agents start
9 taking part in co-defining the boundary objects-in-use, the joint recognition of these objects as
10 valuable may disappear. If, for example, all Insura’s sales agents started contributing to the best
11 practice database, contributors would no longer be positively distinguished (as evidenced in the
12 cases described by Schultze and Boland 2000; Garud and Kumaraswamy 2004).

13 Fourth, as agents engage in the joint field, they produce a new boundary between boundary
14 spanners and “non-spanners,” which creates a tension between growing one or the another kind
15 of competence in boundary spanning (Wenger 1998: 141; Carlile 2002: 442; Orlikowski 2002:
16 269). Through our theorizing, we further unpack this tension. As organizational leadership
17 invests resources in spanning one kind of boundary, they foster the emergence a new boundary
18 between agents who are engaged in the new joint field and agents who are not engaged, or
19 engaged only peripherally. The more Eserve leadership, for example, invested in building
20 “Eserve culture”, the harder it became for others (like Maya) to engage in boundary spanning
21 with Eserve agents. At the same time, the more Eserve strategists engaged in boundary spanning
22 with the client, the harder it became for them to relate to their Eserve colleagues (designers and
23 people working on other projects).

1 **IMPLICATIONS FOR IS IMPLEMENTATION AND USE IN SUPPORTING**

2 **KNOWLEDGE MANAGEMENT**

3 IT-based artifacts have long been viewed as boundary objects intended to support the
4 integration of expertise situated in diverse fields (Star 1989; Boland and Tenkasi 1995;
5 Pawlowski and Robey 2005). We contribute to the IS literature by discussing how system
6 sponsors, who are in positions of power and supervise the introduction, implementation, and use
7 of IS, can take into consideration the practical tensions associated with the emergence of IT-
8 based artifacts as boundary objects-in-use⁵. We look at two key decisions that such agents
9 typically influence: 1) how to choose agents to be nominated into boundary spanning roles; and
10 2) how to grow or restrict the growth of practices surrounding IS use.

11 We argued that the reliance on boundary spanners-in-practice is crucial for the emergence of
12 IT artifacts as boundary objects-in-use. We also argued that nominating agents to particular
13 boundary spanners' roles and designing IT artifacts for particular boundary spanning purposes
14 may hurt or help the development of a boundary spanning competence depending on whose
15 hands these titles and objects fall into. In IS implementation efforts, IS project managers or KM
16 group members are typically nominated to perform boundary spanning roles. Our findings
17 suggest the importance of paying close attention to the positions of nominated agents within each
18 field involved. Are these agents able and willing to become at least peripheral participants in the
19 practices of the fields they are supposed to span? Are they willing to risk possible
20 marginalization within these fields to gain the benefits of building the new joint field? These
21 considerations may imply that, rather than promoting—and it is often a promotion—a person
22 who is most distinguished in a given field to a boundary spanning position, building an

⁵ We view IS as an infrastructure supporting the use of IT-based artifacts, which may be specific IT applications.

1 organizational competence in boundary spanning may require promoting somebody who is less
2 distinguished. Beyond the classical considerations of “let professionals do what they are good at
3 doing”, our investigation shows that “stellar professionals” or “strong local team players” may be
4 unwilling to become even partial participants in the practices of the other field. On the other
5 hand, this consideration needs to be balanced with the concern for legitimacy of a nominated
6 boundary spanner as a negotiator on behalf of a field. Our data shows that through the
7 “supremely mysterious power” of nomination (Bourdieu 1998: 51), even peripheral participants
8 in a given field can be seen as legitimate negotiators.

9 Beyond the initial nomination of boundary spanners, system sponsors also have to follow
10 what happens in practice. They need to see if nominated boundary spanners actually engage in
11 building the joint field or, instead, if they are using their position to prevent the emergence of
12 alternative boundary spanners-in-practice. Designing of an IT-based artifact as a boundary object
13 “for everybody to use” (for example, by granting everybody proper permissions to develop and
14 use these artifacts) as opposed to “for nominated boundary spanners to decide how to use them”
15 may lead to the later scenario. In this case, the geographical proximity may be detrimental to the
16 emergence of a joint field as nominated boundary spanners can advocate avoidance and put
17 restrictions on IT use. In distributed contexts, there is greater incentive even for nominated
18 boundary spanners to use IT as economic capital to reduce the costs of transporting artifacts.

19 The second key area of influence for system sponsors concern how they use their symbolic,
20 economic, cultural, and social capital to influence a wider adoption of IS. From our discussion, it
21 follows that investing in a wider adoption may be problematic for several reasons. First, as IT-
22 based artifacts get widely adopted (e.g., beyond agents involved in their development), they may
23 stop being boundary objects-in-use by either failing to be useful in local practices or losing their

1 common identity. It is well documented that wider uses of IS are often in conflict with local
2 practices (Suchman 1987; Star and Ruhdeler 1996; Nidumolu et al. 2001). Our work emphasizes
3 the need to pay continuous attention not only to local usefulness, but also to the development and
4 maintenance of a common identity for IT-based artifacts designed to support KM across
5 boundaries. Failure to do so may lead to IS use that merely reifies existing boundaries (as was
6 demonstrated in an example of a KMS implementation described by Newell et al. 2001). As
7 agents from new and different practices start using a given IS, boundary spanners-in-practice
8 need to emerge for these new boundaries.

9 The second tension associated with wider adoption of IS intended to support boundary
10 spanning in practice is that, through such growth, boundary spanners'-in-practice "value added"
11 (symbolic capital) gets eroded if other agents engage in the joint field and start participating
12 more fully in the negotiation of the relationship among fields. This happened in the case
13 described by Schultze and Boland's (2000) and resulted in boundary spanners-in-practice
14 resisting wider adoption of a KMS so as to preserve their position as the only boundary spanners-
15 in-practice in a given organization. Thus, when investing resources in growing the practice,
16 system sponsors should consider the possibility of such resistance.

17 Finally, system sponsors need to be careful when providing incentives for systems' growth,
18 such as symbolic distinctions and monetary rewards. If rewards are widely accessible to many
19 agents in the organizational field, then the wide adoption and contribution to the system may lead
20 to information overload (Garud and Kumaraswamy 2004). On other hand, if these distinctions
21 are hard to obtain and are seen as valuable in practice, then agents who contribute to and use the
22 system may start protecting their prerogative as the only system users (boundary spanners-in-
23 practice) vs. non-users (non-spanners). Thus, the development of a strong group of active users

1 who see themselves as “elite” boundary spanners may be critical for fostering an organizational
2 competence in boundary spanning (as we saw in the Insura case) but it may also be detrimental
3 to it (as in the case of Eserve designers).

4 **CONTRIBUTIONS TO KNOWLEDGE MANAGEMENT**

5 The practice-based view on KM in organizations draws on practice theory and on the notion
6 of situatedness to argue that organizational competencies (knowledgeability) are embedded in
7 practice. Whereas earlier works on this topic focused on how to build competencies within
8 particular domains of expertise (communities of practice) (Brown and Duguid 1991), more
9 recent works argued that another critical aspect of such competencies is in agents’ ability to span
10 multiple boundaries in practice (Orlikowski 2002; Bechky 2003; Carlile 2004). The key
11 contribution of our work to this literature is in examining how an organizational competence in
12 boundary spanning actually *emerges* in practice. Such emergence is associated with the
13 engagement of agents in a new joint field—“a space between”—through which agents develop a
14 new interest in spanning boundaries of multiple fields and eventually “transforming knowledge”
15 (Carlile 2004). We show how the emergence of a new joint field is facilitated by agents who
16 become boundary spanners-in-practice and by the use of artifacts that become boundary objects-
17 in-use. In this way, we integrate more closely extensive streams of research on boundary
18 spanners and objects into a practice-based view on KM.

19 The second contribution of this paper to the literature on KM is in providing a theoretical and
20 empirical examination of the specific tensions involved in fostering the emergence of a new joint
21 field. The existence of tensions involved in developing an organizational competence in
22 boundary spanning has been acknowledged before. Prior research points out that individual
23 agents may struggle to achieve knowledge transformation across boundaries (specifically across

1 "pragmatic" boundaries according to Carlile 2002; Carlile 2004); that formal organizational
2 mechanisms (like roles and rules) may not translate into the development of intended situated
3 practices (Brown and Duguid 1991; Wenger 1998); and that organizations may develop inertia
4 associated with building joint fields (Orlikowski 2002). This paper views these different kinds of
5 tensions through a single theoretical lens which draws on Bourdieu's theory and in light of the
6 emergence of a new joint field.

7 Finally, we draw on IS literature to clarify how IT-based artifacts can support the
8 development of an organizational competence in boundary-spanning by becoming boundary
9 objects-in-use. Various types of IS, and KMS in particular, are often designated as tools to
10 support KM across the boundaries of professional communities and distributed groups (Alavi
11 and Leidner 2001; Pan and Leidner 2003). In practice, however, the implementation and use of
12 this systems often fails to fulfill these expectations (McDermott 1999; Schultze and Boland
13 2000). Specifically, many IT-based artifacts are used solely in local contexts and do not promote
14 the emergence of organizational competence in boundary spanning (Newell et al. 2001; Currie
15 and Kerrin 2004). It has been argued that IT use for KM is more likely to succeed when the
16 system is integrated into practices of particular communities (Goodman and Darr 1998;
17 McDermott 1999) as illustrated by the successful implementation of Xerox's "Eureka" system,
18 for example (Bobrow and Whalen 2002). Our paper illuminates how IT can be implemented and
19 used to support KM *across boundaries* by focusing on fostering the emergence of a new joint
20 field (a new "organizational community"). This view allow us to highlight specific tensions that
21 IS project sponsors need to pay attention to when nominating project managers and growing
22 organizational competencies in boundary spanning.

REFERENCES

- 1
- 2 Ackerman, M., and Halverson, C. "Organizational Memory: Processes, Boundary Objects, and
3 Trajectories," 32nd Annual Hawaii International Conference on System Sciences,
4 HICSS-32, IEEE, Maui, HI, USA, 1999, pp. 43-55.
- 5 Agar, M. *The professional stranger: an informal introduction to ethnography* Academic Press,
6 New York, NY, 1980, pp. xi, 227.
- 7 Alavi, M., and Leidner, D.E. "Review: Knowledge management and knowledge management
8 systems: Conceptual foundations and research issues," *MIS Quarterly* (25:1), Mar 2001,
9 p 107.
- 10 Aldrich, H., and Herker, D. "Boundary Spanning Roles and Organization Structure," *Academy of*
11 *Management Review* (2:2), Apr. 1977, pp 217-230.
- 12 Allen, T.J., and Cohen, S.I. "Information flow in Research and Development laboratories,"
13 *Administrative Science Quarterly* (14:1), March 1969, pp 12 - 19.
- 14 Ancona, D., and Caldwell, D. "Bridging the boundary: External activity and performance of
15 organizational teams," *Administrative Science Quarterly* (37) 1992, pp 634-665.
- 16 At-Twaijri, M.I.A., and Montanari, J.R. "The Impact of Context and Choice on the Boundary-
17 Spanning Process: An Empirical Extension," *Human Relations* (40:12), Dec 1987, p 783.
- 18 Barley, S.R. "Technology as an Occasion for Structuring - Evidence from Observations of Ct
19 Scanners and the Social-Order of Radiology Departments," *Administrative Science*
20 *Quarterly* (31:1), Mar 1986, pp 78-108.
- 21 Baroudi, J.J. "The Impact of Role Variables on IS Personnel Work Attitudes and Intentions,"
22 *MIS Quarterly* (9:4), Dec 1985, p 341.
- 23 Bechky, B. "Sharing Meaning Across Occupational Communities: The Transformation of
24 Understanding on a Product Floor," *Organization Science* (14:3), May-June 2003, pp
25 312-330.
- 26 Bechky, B.A. "Crossing Occupational Boundaries: Communication and Learning on a
27 Production Floor," Stanford University, CA, USA, 1999, p. 116.
- 28 Becker, H.S. *Tricks of the Trade: How to think about your research while you're doing it* The
29 University of Chicago Press, Chicago and London, 1998, p. 232.
- 30 Bobrow, D., and Whalen, J. "Community Knowledge Sharing in Practice: The Eureka Story,"
31 *Reflections: The SoL Journal* (4:2) 2002, pp 47-57.
- 32 Bødker, S. "Understanding representation in design," *Human-Computer Interaction* (13:2) 1998,
33 pp 107-125.
- 34 Bødker, S. "Scenarios in user-centred design - setting the stage for reflection and action,"
35 *Interacting with Computers* (13:1) 2000, pp 61-75.
- 36 Boland, R.J., Jr., and Tenkasi, R.V. "Perspective making and perspective taking in communities
37 of knowing," *Organization Science* (6:4) 1995, pp 350-372.
- 38 Bourdieu, P. *Outline of a theory of practice* Cambridge University Press, Cambridge ; New
39 York, 1977, pp. viii, 248.
- 40 Bourdieu, P. *Practical reason: on the theory of action* Stanford University Press, Stanford,
41 Calif., 1998, pp. xi, 153.
- 42 Bourdieu, P., and Wacquant, L.J.D. *An invitation to reflexive sociology* University of Chicago
43 Press, Chicago, 1992, pp. xiv, 332.
- 44 Bowker, G., and Star, S.L. "Knowledge and Information in International Information
45 Management: Problems of Classification and Coding," in: *Information Acumen: The*

1 *Understanding and Use of Knowledge in Modern Business*, L. Bud-Frierman (ed.),
2 Routledge, London, 1994, pp. 187-213.

3 Bowker, G., Timmermans, S., and Star, S.L. "Infrastructure and Organizational Transformations:
4 Classifying Nurses' Work," in: *Information Technology and Changes in Organizational*
5 *Work*, W.J. Orlikowski, G. Walsham, M.R. Jones and J.I. DeGross (eds.), Chapman and
6 Hall, London, UK, 1996, pp. 344-369.

7 Briers, M., and Chua, W.F. "The role of actor-networks and boundary objects in management
8 accounting change: A field study of an implementation of activity-based costing,"
9 *Accounting, Organizations and Society* (26:3) 2001, pp 237-269.

10 Brown, J.S., and Duguid, P. "Organizational Learning and Communities-of-Practice: Toward a
11 Unified View of Working, Learning, and Innovation," *Organization Science* (2:1) 1991,
12 pp 40-57.

13 Caldwell, D.H., and O'Reilly, C.A.I. "Boundary Spanning and Individual Performance: The
14 Impact of Self-Monitoring," *Journal of Applied Psychology* (67:1), Feb 1982, p 124.

15 Carlile, P.R. "Understanding Knowledge Transformation In Product Development: Making
16 Knowledge Manifest Through Boundary Objects," University Of Michigan, USA, 1997,
17 p. 188.

18 Carlile, P.R. "A Pragmatic View of Knowledge and Boundaries: Boundary Objects in New
19 Product Development," *Organization Science* (13:4), July-August 2002, pp 442-455.

20 Carlile, P.R. "Transferring, Translating, and Transforming: An Integrative Framework for
21 Managing Knowledge Across Boundaries," *Organization Science* (15:5), Sep-Oct 2004,
22 pp 555-568.

23 Certeau, M.d. *The practice of everyday life* University of California Press, Berkeley, 1984, pp.
24 xxiv, 229 p.

25 Contu, A., and Willmott, H. "Re-embedding Situatedness: The Importance of Power Relations in
26 Learning Theory," *Organization Science* (14:3), May-June 2003, pp 283-296.

27 Cross, R.L., and Parker, A. *The hidden power of social networks : understanding how work*
28 *really gets done in organizations* Harvard Business School Press, Boston, Mass., 2004,
29 pp. xiii, 213.

30 Currie, G., and Kerrin, M. "The limits of a technological fix to knowledge management:
31 Epistemological, political and cultural issues in the case of intranet implementation,"
32 *Management Learning* (35:1) 2004, pp 9-29.

33 Davenport, T.H., and Prusak, L. *Working knowledge : how organizations manage what they*
34 *know* Harvard Business School Press, Boston, Mass, 1998, pp. xv, 199 p.

35 Dougherty, D. "A Practice-Centered Model of Organizational Renewal Through Product
36 Innovation," *Strategic Management Journal* (13:Special Issue) 1992, pp 77 ,16 pages.

37 Dubinsky, A.J., Michaels, R.E., Kotabe, M., Lim, C.U., and Moon, H.-C. "Influence of Role
38 Stress on Industrial Salespeople's Work Outcomes in the United States, Japan, and
39 Korea," *Journal of International Business Studies* (23:1), 1st Qtr. 1992, pp 77-99.

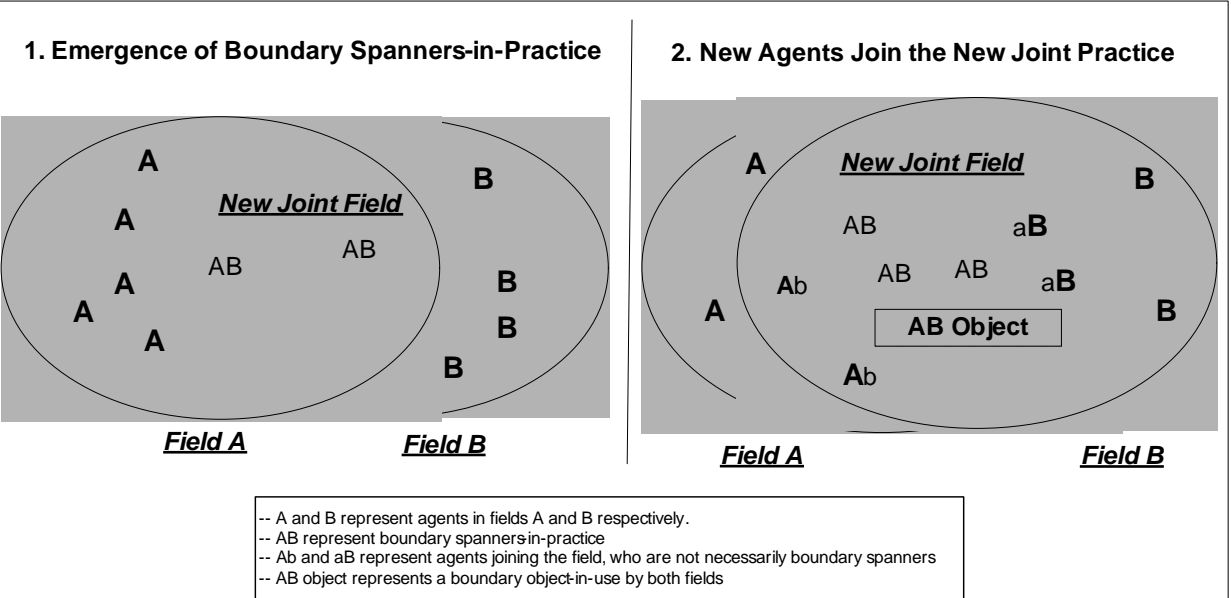
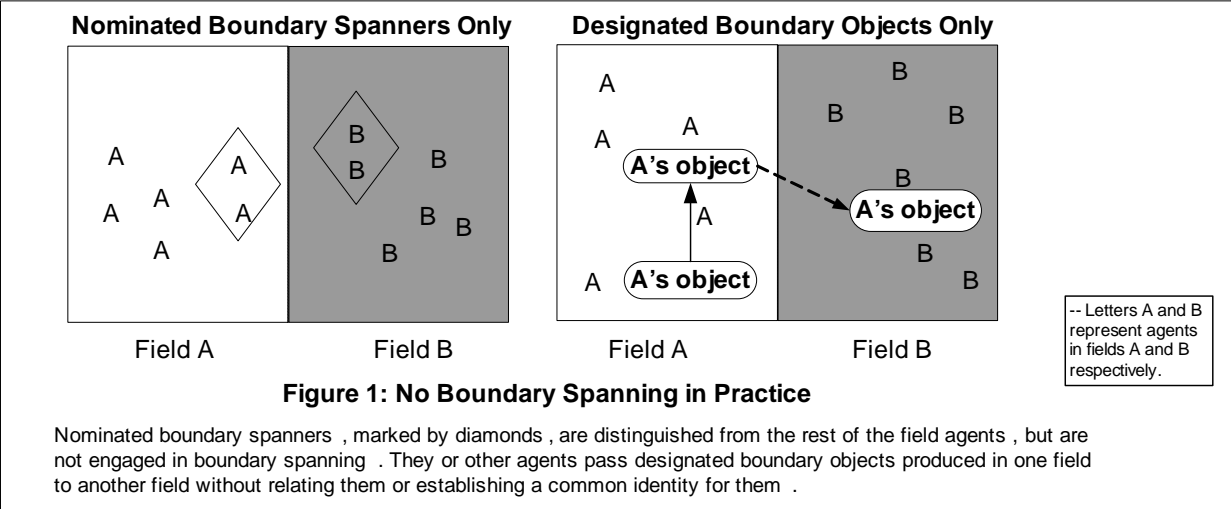
40 Dyer, J.H., and Singh, H. "The relational view: Cooperative strategy and sources of
41 interorganizational competitive advantage," *Academy of Management Review* (23:4)
42 1998, pp 660-679.

43 Friedman, R.A., and Podolny, J. "Differentiation of Boundary Spanning Roles: Labor
44 Negotiations and Implications for Role Conflict," *Administrative Science Quarterly*
45 (37:1) 1992, pp 28-47.

- 1 Garud, R., and Kumaraswamy, A. "Viscous and Virtuous Circles in the management of
2 Knowledge: The Case of Infosys Technologies," in: *New York University Working Paper*,
3 New York, NY, 2004, pp. 1-46.
- 4 Giddens, A. *The constitution of society: outline of the theory of structuration* University of
5 California Press, Berkeley, 1984, pp. xxxvii, 402.
- 6 Glaser, B.G., and Strauss, A.L. *The discovery of grounded theory; strategies for qualitative
7 research* Aldine Pub. Co., Chicago, IL, 1967, pp. x, 271.
- 8 Goodman, P.S., and Darr, E.D. "Computer-aided systems and communities: Mechanisms for
9 organizational learning in distributed environments," *MIS Quarterly*; (22:4) 1998, pp
10 417-440.
- 11 Grant, R.M. "Toward a knowledge-based theory of the firm," *Strategic Management Journal*
12 (17:Winter) 1996, pp 109-122.
- 13 Griffith, T.L., Sawyer, J.E., and Neale, M.A. "Virtualness and knowledge in teams: Managing
14 the love triangle of organizations, individuals, and information technology1," *MIS
15 Quarterly* (27:2), Jun 2003, p 265.
- 16 Hargadon, A. *How breakthroughs happen : the surprising truth about how companies innovate*
17 Harvard Business School Press, Boston, Mass., 2003, pp. xvi, 254.
- 18 Hargadon, A., and Sutton, R.I. "Technology brokering and innovation in a product development
19 firm," *Administrative Science Quarterly* (42:4) 1997, pp 716-749.
- 20 Henderson, K. "Flexible Sketches and Inflexible Data Bases: Visual Communication
21 Conscriptioin Devices, and Boundary Objects in Design Engineering," *Science,
22 Technology, & Human Value* (16:4) 1991, pp 448-473.
- 23 Katz, R., Tushman, M., and Allen , T.J. "The influence of supervisory promotion and network
24 location on subordinate careers in a dual ladder RD&E setting," *Management Science*
25 (41:5), May 1995, p 848.
- 26 Keller, R.T., and Holland, W.E. "Boundary-Spanning Roles in a Research and Development
27 Organization: An Empirical Investigation," *Academy of Management Journal* (18:2), Jun.
28 1975, pp 388-393.
- 29 Klein, H.K., and Myers, M.D. "A Set of Principles for Conducting and Evaluating Interpretive
30 Field Studies in Information Systems," *MIS Quarterly* (23:1) 1999, pp 67-92.
- 31 Kogut, B., and Zander, U. "Knowledge of the Firm, Combinative Capabilities, and the
32 Replication of Technology," *Organization Science* (3:3), August 1992, pp 383-397.
- 33 Lam, A. "Embedded firms, embedded knowledge: Problems of collaboration and knowledge
34 transfer in global cooperative ventures," *Organization Studies* (18:6) 1997, pp 973-996.
- 35 Lave, J. *Cognition in practice: mind, mathematics, and culture in everyday life* Cambridge
36 University Press, Cambridge ; New York, 1988, pp. xv, 214.
- 37 Lave, J., and Wenger, E. *Situated learning: legitimate peripheral participation* Cambridge
38 University Press, Cambridge, England, 1991, p. 138.
- 39 Leifer, R., and Delbecq, A. "Organizational/Environmental Interchange: A Model of Boundary
40 Spanning Activity," *Academy of Management Review* (3:1), Jan. 1978, pp 40-50.
- 41 Lepak, D.P., and Snell, S.A. "The human resource architecture: Toward a theory of human
42 capital allocation and development," *Academy of Management Review* (24:1) 1999, pp
43 31-48.
- 44 Levina, N. "Multi-party Information Systems Development: The Challenge of Cross-Boundary
45 Collaboration," in: *Sloan School of Management*, Massachusetts Institute of Technology,
46 Cambridge, MA, 2001, p. 300.

- 1 Liebeskind, J.P., Oliver, A.L., Zucker, L., and Brewer, M. "Social networks, learning, and
2 flexibility: Sourcing scientific knowledge in new biotechnology firms," *Organization*
3 *Science* (7:4), Jul/Aug 1996, pp 428-443.
- 4 Lysonski, S. "A Boundary Theory Investigation of the Product Manager's Role," *Journal of*
5 *Marketing* (49:1), Winter 1985, p 26.
- 6 Lysonski, S.J., and Johnson, E.M. "The Sales Manager as a Boundary Spanner: A Role Theory
7 Analysis," *The Journal of Personal Selling & Sales Management* (3:2), Nov 1983, p 8.
- 8 Majchrzak, A., Cooper, L.P., and Neece, O.E. "Knowledge Reuse for Innovation," *Management*
9 *Science* (50:2), Feb 2004, p 174.
- 10 McDermott, R. "Why Information Technology Inspired But Cannot Deliver Knowledge
11 Management," *California Management Review* (41:4) 1999, pp 103-117.
- 12 Nahapiet, J., and Ghoshal, S. "Social capital, intellectual capital, and the organizational
13 advantage," *Academy of Management Review* (23:2), Apr 1998, pp 242-266.
- 14 Newell, S., Scarbrough, H., and Swan, J. "From global knowledge management to internal
15 electronic fences: Contradictory outcomes of intranet development," *British Journal of*
16 *Management* (12:2) 2001, pp 97 - 111.
- 17 Nidumolu, S.R., Subramani, M., and Aldrich, A. "Situated learning and the situated knowledge
18 web: Exploring the ground beneath knowledge management," *Journal of Management*
19 *Information Systems* (18:1), SUM 2001, pp 115-150.
- 20 Nochur, K.S., and Allen, T.J. "Do Nominated Boundary Spanners Become Effective
21 Technological Gatekeepers?," *IEEE Transactions on Engineering Management* (39:3)
22 1992, pp 265-269.
- 23 Nonaka, I. "A dynamic theory of organizational knowledge creation," *Organization Science* (5:1)
24 1994, pp 14-37.
- 25 Orlikowski, W.J. "The Duality of Technology: Rethinking the Concept of Technology in
26 Organizations," *Organization Science* (3:3), August 1992, pp 398-427.
- 27 Orlikowski, W.J. "Using technology and constituting structures: A practice lens for studying
28 technology in organizations," *Organization Science* (11:4) 2000, pp 404-428.
- 29 Orlikowski, W.J. "Knowing in practice: Enacting a collective capability in distributed
30 organizing," *Organization Science* (13:3), May/Jun 2002, p 249.
- 31 Pan, S.L., and Leidner, D.E. "Bridging Communities of Practice with Information Technology in
32 Pursuit of Global Knowledge Sharing," *Journal of Strategic Information Systems* (12:1),
33 March 2003, pp 71-88.
- 34 Pawlowski, S.D., and Robey, D. "Bridging User Organizations: Knowledge Brokering and the
35 Work of Information Technology Professionals," *MIS Quarterly* (29:forthcoming) 2005.
- 36 Pettigrew, A.M. "Longitudinal Field Research on Change: Theory and Practice," *Organization*
37 *Science* (1:3), August 1990, pp 267-292.
- 38 Powell, W.W. "Neither Market nor Hierarchy: Network Forms of Organization," *Research in*
39 *Organizational Behavior* (12) 1990, pp 295-336.
- 40 Schultze, U., and Boland, R.J. "Knowledge management technology and the reproduction of
41 knowledge work practices," *Journal of Strategic Information Systems* (9:2-3), SEP 2000,
42 pp 193-212.
- 43 Schultze, U., and Leidner, D.E. "Studying knowledge management in information systems
44 research: Discourses and theoretical assumptions," *MIS Quarterly* (26:3), Sep 2002, p
45 213.

- 1 Singh, J., and Rhoads, G.K. "Boundary Role Ambiguity in Marketing-Oriented Positions: A
2 Multidimensional, Multifaceted Operationalization," *JMR, Journal of Marketing*
3 *Research* (28:3), Aug 1991, p 328.
- 4 Singh, J., Verbeke, W., and Rhoads, G.K. "Do organizational practices matter in role stress
5 processes? A study of direct and moderating effects for marketing-oriented boundary
6 spanners," *Journal of Marketing* (60:3), Jul 1996, p 69.
- 7 Star, S.L. "The Structure of Ill-Structured Solutions: Boundary Objects and Heterogeneous
8 Distributed Problem Solving," in: *Readings in Distributed Artificial Intelligence*, M.
9 Huhn and L. Gasser (eds.), Morgan Kaufman, Menlo Park, CA, 1989, pp. 37-54.
- 10 Star, S.L., and Griesemer, J.R. "Institutional Ecology, 'Translations' and Boundary Objects:
11 Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology 1907-39,"
12 *Social Studies of Science* (19) 1989, pp 387-420.
- 13 Star, S.L., and Ruhdeler, K. "Steps toward an ecology infrastructure: Design and access for large
14 information spaces," *Information Systems Research* (7:1) 1996, pp 111 - 134.
- 15 Staudenmayer, N., Tyre, M., and Perlow, L. "Time to Change: Temporal Shifts as Enablers of
16 Organizational Change," *Organization Science* (13:5), September-October 2002, pp 583-
17 597.
- 18 Strauss, A.L., and Corbin, J.M. *Basics of qualitative research : techniques and procedures for*
19 *developing grounded theory*, (2nd ed.) Sage Publications, Thousand Oaks, 1998, pp. xiii,
20 312.
- 21 Suchman, L.A. *Plans and situated actions : the problem of human-machine communication*
22 Cambridge University Press, Cambridge Cambridgeshire ; New York, 1987, pp. xii, 203.
- 23 Swan, J., and Scarbrough, H. "Knowledge, Purpose and Process: Linking Knowledge
24 Management and Innovation," Proceedings of the 34th Hawaii International Conference
25 on System Sciences, Hawaii, USA, 2001, pp. 1-10.
- 26 Tajfel, H. *Differentiation between social groups: studies in the social psychology of intergroup*
27 *relations* Published in cooperation with European Association of Experimental Social
28 Psychology by Academic Press, London ; New York, 1978, pp. xv, 474.
- 29 Tsoukas, H. "The firm as a distributed knowledge system: A constructionist approach," *Strategic*
30 *Management Journal* (17:Winter), Winter 1996, pp 11-25.
- 31 Tushman, M.L. "Special boundary roles in the innovation process," *Administrative Science*
32 *Quarterly* (22:4) 1977, pp 587 - 605.
- 33 Tushman, M.L., and Scanlan, T.J. "Boundary Spanning Individuals: Their Role in Information
34 Transfer and Their Antecedents," *Academy of Management Journal* (24:2), Jun 1981, p
35 289.
- 36 Tyre, M.J., and Orlikowski, W.J. "Windows of opportunity: Temporal patterns of technological
37 adaptation in organizations," *Organization Science* (5:1), February 1994, pp 98-118.
- 38 Verton, D. "Inadequate Systems Play Role in Columbia Disaster, Report Finds," in:
39 *Computerworld*, September 1, 2003.
- 40 von Hippel, E. *The sources of innovation* Oxford University Press, New York, 1988, pp. xi, 218.
- 41 Wenger, E. *Communities of practice: learning, meaning, and identity* Cambridge University
42 Press, Cambridge, U.K. ; New York, N.Y., 1998, pp. xv, 318.
- 43 Wiesenfeld, B., and Hewlin, P. "Splintered Identity and Organizational Change: The
44 Predicament of Boundary Spanning Managers," in: *Research on Managing Groups and*
45 *Teams*, Elsevier Science Ltd., 2003, pp. 27-52.
- 46
47



1