Turning a Community into a Market: A Practice Perspective on Information Technology Use in Boundary Spanning

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ABSTRACT: This paper examines how information technology (IT) transforms relations across fields of practice within organizations. Drawing on Bourdieu's practice theory, we argue that the production of any practice involves varying degrees of embodiment (i.e., relying on personal relationships) and objectification (i.e., relying on the exchange of objects). We subsequently characterize boundary-spanning practices according to their relative degrees of embodiment and objectification. We distinguish between "market-like" boundary-spanning practices, which rely primarily on an objectified mode of practice production, from "community-like" practices, which involve mostly the embodied mode of practice production. IT is then conceptualized as a medium for sharing objects in the production of practices. As such, IT use allows for the sharing of objects without relying on embodied relationships.

We use data from an in-depth ethnographic case study to investigate how IT was used to transform community-like boundary-spanning practices within an organization into market-like ones. Moreover, we demonstrate how, as IT was used to support the exchange and combination of depersonalized objects, other aspects of the practice (such as the roles of intermediaries and the nature of meetings) also changed. The related changes in these diverse aspects of a boundary-spanning practice supported the trend toward greater objectification. IT use also increased visibility of the

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terms associated with object exchange. This increased visibility exposed the inequity of the exchange and encouraged the disadvantaged party to renegotiate the relationship.

KEY WORDS AND PHRASES: boundary objects, boundary spanners, boundary spanning, communities of practice, coordination mechanisms, information technology use, practice theory, qualitative methods.

IT IS GENERALLY ASSUMED THAT INFORMATION TECHNOLOGY (IT) will help reorganize business relations, be they relations among organizations [15, 29, 52] or among organizational units [16]. The impact of IT on these relations, however, has been difficult to predict. In many situations, IT use in boundary-spanning relationships has brought about contradictory and unexpected consequences [48, 49].

For example, among organizations, it has been argued that IT can lead to more formalized relationships, improved monitoring of actions, and greater reliance on documents and procedures instead of interpersonal dynamics [15, 35, 37]. In other words, IT can help build and strengthen market exchanges or "arm's-length" relationships [51]. In a seemingly contradictory way, IT can also be used to facilitate the development of shared "boundary objects" across organizations [36, 53] while fostering social ties between diverse individuals [39]. Moreover, using IT to deal with the more mundane aspects of business relations allows people to focus on the building of interpersonal relationships, thereby strengthening "socially embedded" business relations among organizations [26].

Similarly, using IT to span boundaries within organizations has led to further contradictions. On one hand, IT use can lead to the deterioration of community ties when face-to-face contact is replaced with less intimate, IT-based interactions. In such cases, IT use reinforces preexisting intraorganizational boundaries [41, 50] and disrupts coproduction processes [28]. On the other hand, IT use can foster closer relationships among interorganizational communities by facilitating the development of boundary objects [5, 13] and a common repertoire of actions [36]. For example, the literature on communities of practice (CoPs) and social networks has argued that IT use can strengthen community ties within organizations [11, 63], enable informal connections among people [18], and lead to altruistic behaviors [17].

Practice-based theorizing about the effects of IT on organizations suggests that these contradictory implications are related to the diverse ways in which social structures emerge as IT becomes part of everyday work practices [43]. Using this insight, Schultze and Orlikowski [51] recently investigated how IT was used to transform a socially embedded relationship into an arm's-length relationship between an organization and its clients. Levina and Vaast [36, pp. 343–346] drew on a practice perspective to show how IT was used to reinforce the institutional boundaries between clients and vendors on an outsourced IT project. Within organizations, a number of recent

studies have investigated how, through intraorganizational work practices, IT can be used to foster participation in shared communities thereby bridging institutional boundaries among organizational units [36, pp. 346–350, 45, 60]. Although there has been evidence suggesting that IT can actually lead to a deterioration of coproduction processes within organizations (see above), to the best of our knowledge, there has not been an in-depth investigation as to *how* the use of IT in intraorganizational work practice can help deteriorate community ties and reify institutional boundaries within organizations (see Table 1).

We investigate this issue by means of an ethnographic field study of such a transformation. The study focuses on intraorganizational relations between the IT department and other business units in a medium-sized European insurance firm. Like prior studies that tried to shed light on the contradictory consequences of IT use, we too focus on the everyday practices through which IT was adopted [51].

Embodiment and Objectification in the Production of Boundary-Spanning Practices

FOCUSING ON PRACTICE MEANS being attentive to people's recurrent, everyday activities. Moreover, it means forming an understanding of how such collective activities are produced in a historical and social context, which gives structure and meaning to what people do [62, p. 47]. This research adopts Bourdieu's theory of practice. Bourdieu's theory is especially relevant because it focuses on relations and relational differences (distinctions) among agents and how such differences give rise to social formations and their boundaries [9].

The Emergence of Fields and Boundaries

According to Bourdieu, relational distinctions among agents arise through recurrent and situated practice. These relational distinctions are sorted out in settings, or "fields-of-practice" [9].[1] At any time, an individual or institutional actor ("agent") can engage in multiple fields of practice. Each field potentially shapes an agent's interests and practical competencies while distinguishing him or her from agents practicing in other fields. Fields-of-practice both unite and divide agents. On one hand, fields unite agents in pursuit of a common interest. On the other hand, conflicts and boundaries are pervasive within and across fields. Agents within fields have different means and attain different levels of success while fulfilling their interests and, hence, are divided into "haves" and "have-nots," such as when a professional field strongly differentiates masters and apprentices on the basis of tasks performed.

For example, members of an IT department in an organization are part of the organization's field-of-practice *and* of the IT professional field. Similarly, members of a legal department belong to the organizational field and their professional fields as well. When IT professionals and lawyers pursue a common organizational interest by practicing in the same organization, the differences in their professional practices

Table 1. Incorporating IT Use into Inter- and Intraorganizational Work Practices

IT use	Relations across organizational boundary	Relations across boundaries within organizations
IT use helps build community ties	Second case: Levina and Vaast [36, pp. 346–350].	First case: Pawlowski and Robey [45]; Volkoff et al. [60]; Levina and Vaast [36, pp. 343–346].
IT use helps deteriorate community ties	Schultze and Orlikowski [51].	This paper.

set them apart. Moreover, they may also attain different degrees of influence over practices in their joint organizational field while exercising different degrees of control over organizational resources. By enacting practices in a different way (e.g., if lawyers were to gain deep technical knowledge and start writing legal software), these agents can transform not only their relative *positions* in their respective professional fields and their joint organizational field but also the fields themselves (e.g., by creating a new field of legal software developers).

Objectification and Embodiment Modes of Practice Production

Bourdieu introduces the concepts of "embodiment" and "objectification" to refer to the modes of practice production [8, pp. 87–95].[2] These concepts will help us understand how the introduction of IT may shift the nature of boundary-spanning practices.

With respect to embodiment, the habitual production of practices relies heavily on community ties and norms of reciprocity. Social relations are made, unmade, and remade based on *interpersonal* relationships—they are tied to individual "bodies." Agents draw on memories of their interpersonal interactions and mimic acceptable behaviors, appearances, and manners to reproduce existing relations. Practices are therefore produced and reproduced without overt explication among agents; often agents simply "play along." Lave and Wenger's [33] seminal work eloquently described how community relations based on such interpersonal networks of reciprocity, joint identities, and repertoires of actions are formed.

On the other hand, "objectification" involves naming (symbolically representing) specific relations among agents so that these relations can be reproduced beyond a given interaction. The production of relations, therefore, no longer relies on direct interpersonal connections and embodied memories [8, pp. 183–197]. Objects (both tangible and intangible) are symbolic (discursive) representations of practice and relations produced through practice. Objects can take the form of institutions, markets, documents, procedures, roles, codes, terms, and so on. Once named, these relations

can be invoked in different contexts. They can "subsist without agents having to recreate them continuously and in their entirety by deliberate action" [8, p. 184].

The production of any given practice involves varying degrees of embodiment *and* objectification. These two concepts stand in a dialectical relationship to each other: they are both mutually constitutive and contradictory. The two concepts are mutually constitutive because an object is void of social meaning without the participation of individuals in producing and using it, and because embodied interactions are void of the social meaning if agents do not symbolically express their experiences [8, p. 91, 62, p. 62]. Yet these two concepts are also contradictory. Specifically, Bourdieu identifies a crucial dilemma related to objectification: once made explicit (often by the empowered agents), objects can be used to reproduce the relations in a given context or gain advantage in a new context more easily than before. However, because they are part of a conscious discourse, objectified relations are more easily challenged and transformed. For example, in a relationship among organizational units, an IT department's members may be habitually taking orders from other departments without protest. If a new organization policy states, for example, that in every matter, the IT department must take orders from other departments and comply with those orders, the IT department member may officially object to the statement and engage the policy makers in a dialogue about a more equal distribution of power. In practice, there is often a tenuously negotiated and renegotiated balance between a *degree* of objectification, on one hand, and embodiment, on the other [8, p. 184].

Moreover, with respect to interfield relationships, Bourdieu believed that all objects are produced in a particular field. In some cases, however, they are used to represent relations among agents within a particular field and, in other cases, among its subfields. Objects become a sort of currency within and among fields. Boundaries of fields such as professional groups, organizations, or markets are demarcated by objects such as names of organizations, entrance examinations, or money. For example, an organizational title both demarcates a position within an organization and distinguishes those who belong to an organization from those who do not. Yet, in a field of industrial organizations, titles in one organization can be traded for "similar" titles in another.

Theoretical Classification of Boundary-Spanning Practices

The distinction between the two modes of practice production allows us to conceptually differentiate types of boundary-spanning practices.

When agents rely primarily on interpersonal relationships and engage in a *joint production and negotiation* of objects and their meaning, such practice can be described as "community-like." These boundary-spanning practices often acquire a name that designates the pursuit of a common enterprise and identifies the emerging field and its members [33, 62]. Although there are always distinctions among agents within the field (because of their diverse histories), the more institutionalized the name becomes, the more agents (and the researchers studying them) see the work practice as if it were being produced *within a joint field.*

On the other hand, when agents rely on the objectified mode of practice production in working across boundaries, their practices involve an *exchange and combination of work outcomes* that are, for the most part, produced separately. Such practices can be described as "market-like" as the objects are, in a sense, traded for one another. Through the exchange of separately produced objects, the distinctions among agents are more clearly pronounced and the boundary among fields is reinforced ("you made A" and "I made B"). The more institutionalized the boundary is, the more agents tend to see the work practice through which the objects are exchanged as being produced *on the boundary between fields.*

Any given practice is situated somewhere along the embodied/objectified continuum. The nature of practices on each end of the continuum is quite different, however. The engagement of specific agents, such as boundary spanners [2, 56], and the use of specific objects, such as boundary objects [53], differs significantly depending on whether cross-boundary practice is produced within a joint field or not [36].

In the community-like boundary-spanning practices, boundary spanners must build relationships and negotiate the meaning of those relationships. These boundary spanners take on, at least in part, the identity and interests of agents in another field while representing their relationships through the jointly produced objects [36]. Through a wider adoption of these objects, other agents may join the new boundary-spanning practice. Jointly produced objects may acquire a joint identity as well as a local meaning and become "boundary objects." They serve as symbols of the newly acquired identity for the group of people involved in boundary spanning, thereby naming a group of boundary spanners. On the other hand, in a market-like boundary-spanning practice, agents engage in a separate production of objects. Here, brokers, as opposed to boundary spanners, play an intermediary role. Their primary purpose is to negotiate the terms of the exchange between agents in diverse fields and to represent the relationship among fields through formal or informal contracts.

Relevance of the Proposed Theory

Organizational theorizing has already introduced some theoretical distinctions that are similar to the distinction between embodied and objectified modes of practice production introduced in this paper. Within organizations, some of the related distinctions include those between mechanistic and organic organizing [12], classic and postmodern management logic [22], and differentiation and integration among organizational units [34]. Across organizations, researchers have talked about arms-length versus socially embedded relations [51] and market exchanges versus partnerships [6].

What is, then, the utility of introducing yet another set of terms? We maintain that by focusing on the mode of practice production we can better understand how IT is incorporated into organizational practices in different ways so as to either reinforce or help bridge existing boundaries within and across organizations. Bourdieu [8], among other sociologists, has noted that, historically, with the invention of the printing press and the onset of literacy, society became increasingly characterized by objectified practices. The use of IT is directly tied to this increased objectification as

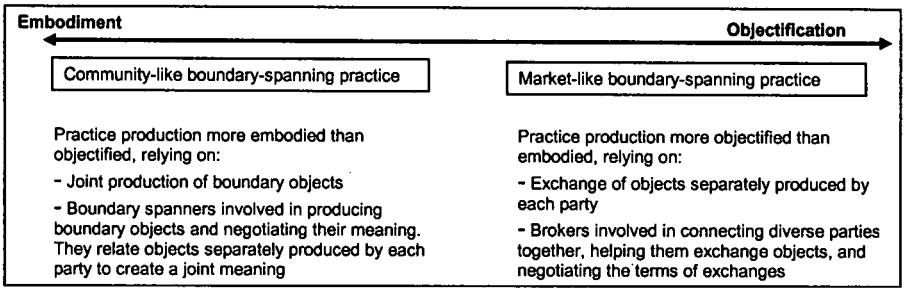

Figure 1. Modes of Practice Production Across Boundaries

relations must be symbolically represented before they can be mediated through technology (moving to the right in Figure 1). Yet this does not necessarily mean that IT will necessarily lead to the emergence of market-like exchanges (moving left in Figure 1). Examples to the opposite are provided in the literature on IT use for supporting highly personal relationships [31, 61]. In our earlier work [36], drawing on Bourdieu, we have shown how IT use can help transform market-like boundary-spanning relations into community-like boundary-spanning relations. In this paper, we unpack the process that occurs in a different context—the one in which IT use in boundary-spanning practices helped transform community-like relations into market-like ones.

Methods

Field Setting

THE FIELD STUDY WAS CONDUCTED at the IT department of ServCo, a mid-sized European insurance company (6,000 employees, revenues approximating €2 billion). Most of the 400 employees of the ServCo's IT department (henceforth SIT) were information systems (IS) professionals (designers, analysts, programmers) who worked on development projects. Two-thirds of SIT's employees were permanent workers, and the rest were temporary workers. SIT's mission was to implement and manage new systems for its internal clients, ServCo's other departments. SIT was located a five-minute walk from its internal clients in a dedicated building—one block from ServCo's headquarters. Projects involved providing new systems or upgrading existing ones. During the time frame covered by this study (1998–2000), most of the existing systems (e.g., billing, accounting, human resources [HR]) were mainframe systems.

At the end of 1998 and into early 1999, Peter, ServCo's new chief information officer (CIO), decided to reorganize SIT: transforming project management activities in order to achieve greater efficiency in dealing with business clients. At the beginning of 2000, a new IT application was implemented to support the new project management practices. In this paper, we focus on the transformation of the boundary-spanning practices between SIT and its internal clients as a new IT application dedicated to manag-

ing these practices was implemented and used (additional details about the site can be found in [57]).

Data Collection and Analysis

A qualitative approach was used in collecting and analyzing data. This approach is particularly suited for theorizing about everyday work practices [4]. Data was collected over a seven-month participant observation period, between March and September 2000. One of us ("the field researcher") had entered the IT department to investigate how the new IT application was integrated into the work practices of project teams. While she had initially entered the field to understand the relations between the use of the IT application and the production of work practices at SIT, the field researcher's interest shifted slightly with her first in-site observations. Specifically, she noticed that the use of IT had not only transformed work practices within SIT but also seemed to have deeply affected the relationships between SIT and its clients during projects' design and development. Thus, the field researcher's interests soon involved exploring how projects were managed, how communications arose between SIT and clients, and how the implementation of the new IT applications had contributed to the transformation of these boundary-spanning practices.

Using ethnographic data collection and analysis techniques [1, 30, 59], the field researcher followed different members of project teams on their daily tasks. She also attended team meetings as well as meetings with clients and had access to the new IT application. She complemented her participant observation with a set of formal, semi-structured interviews (recorded and transcribed, lasting from 45 minutes to two hours) with the IT department's managers (five interviews) and permanent employees on different teams (20 interviews). During the interviews, respondents detailed their work practices, their use of IT, their involvement in project management, and the ensuring subsequent changes that transformed the relationships between the IT department and its clients. Because Peter believed that the field researcher should not be concerned with the views of temporary workers and clients, he did not authorize interviews with them. However, the field researcher took advantage of her extensive presence in the field in order to conduct ten informal interviews with temporary workers and five informal interviews with clients. Extensive notes were taken during and immediately after these meetings. Although participant observations started after the change in management, the field researcher gained access to former IT department's employees who left after the redesign and acquired additional data on the history of the IT department; the retrospective accounts were combined with archival document analysis. For one year after she had left the site, the field researcher maintained contact with key informants who kept her abreast of the latest changes.

In order to make sense of these longitudinal and qualitative observations, the field researcher relied on traditional qualitative and case methods [21, 38] to analyze everyday work practices. Specifically, she started by summarizing her observations in a series of case descriptions that were presented to the study participants and academic colleagues [46]. Her descriptions were gradually refined on the basis of their feed-

back. She then engaged in the open coding of the data to describe the transformation of work practices [54]. The initial set of codes focused on the changing role of individuals and boundaries of work groups. Yet these concepts did not account for how IT was used in the transformation. The field researcher then used Bourdieu's practice theory to develop a framework with greater explanatory power. The use of a priori theoretical concepts is consistent with later developments in grounded theory methods [7, 54]. Finally, as the two authors of this paper started collaborating, the second author suggested alternative interpretations of the case data while addressing the research question. Appendix Table A1 shows how this research and its presentation followed Klein and Myers's [30] principles for conducting interpretive work.[3]

Boundary-Spanning Practices at SIT

Before the Redesign: Community-Like Boundary-Spanning Practices

BEFORE 1999 (TIME OF PETER'S ARRIVAL), project management at the IT department was largely comprised of self-organized teams that frequently communicated with their clients (ServCo's other departments). In the absence of clear rules prescribing how projects were to be managed or how new systems were to be implemented, new projects tended to be organized on the basis of historical precedent. Teams were constituted around clients' departments and applications (e.g., some teams worked for the HR department, others for the marketing department, and others for the network of local branches). Within project teams, members had developed a rapport and thus shared a strong sense of common purpose and responsibility for tasks. Chantal, a member of SIT for 19 years, commented on the informal ways of organizing prior to Peter's arrival:

> Before, I used to work in a team that worked collegially: we were in charge of everything, from the specification of the project to its technical production. Hence, as the team members knew each other well and had been working together for some time, there was no need to formalize everything.

Team members contributed to projects according to their competencies and past experiences. Nonetheless, everyone was expected to participate in as many stages as possible, from its inception to its production.

SIT professionals had developed a history of working with clients, which helped them acquire a good understanding of their clients' business practices. Most decisions regarding the functional features and technical specifications of the new system were made jointly by means of back-and-forth iterations. Moreover, during meetings, clients provided oral feedback as to the project's progress.

On an informal basis, some team members took on the responsibility of building relationships with clients, thereby allowing them to bridge communication gaps between the team and its clients. Oftentimes, these team members had previously worked in the corresponding business unit and later joined SIT through internal transfer and

training programs. The following example is indicative of how close the relationships could be:

> The claims department wanted to amend some of the functionalities of the existing mainframe system that dealt with claims' processing. In particular, the claims department wanted to implement a system that would help determine when to request further investigations of a dubious or particularly large claim before settling. Based on the claims department's initial request, most of members of the SIT team failed to understand what the project was about, for they had no expertise in processing.
>
> Fortunately, one member of the SIT team, Thierry, was able to explain to his colleagues what the claims' department had in mind. Thierry had been a member of SIT for a couple of years, but he had previously worked as a claims' processor at ServCo. At SIT, he was typically working on projects for the claims department. On this particular project, it took Thierry's initiative to explain to SIT members what the claims department had in mind. Thierry commented: "The project was far away from what SIT was doing. Clients were talking pure insurance business to tech people: no wonder they [SIT members] did not understand what they [clients] wanted!"
>
> Thierry continued his involvement on this project and helped the team deliver an application that clients liked and used.

There were many others who were like Thierry and helped IT understand clients' needs while communicating IT constraints. For example, Veronique was an IT employee who used to work for the legal department and who now helped "the computer geeks talk to legal geeks." Similarly, Philippe, an IT analyst who used to work for the accounting department, helped these two departments negotiate their problems. Albert, who used to be ServCo's CIO before Peter, had also been a senior manager of ServCo's other business units, taking on IT management responsibilities late in his 25-year career at ServCo.

There was frequent communication between IT and clients, mostly face-to-face (the IT department was geographically close to most clients' departments) and on the phone. Moreover, since the mid-1990s, an e-mail system had been implemented in the company and people such as Thierry had started using e-mail to maintain personal relations with colleagues across business units and to support project work. It was not long before the use of e-mail fell into a pattern that supported existing relationships. For example, prior to the start of new projects, members of the claims processing department were expected to call Thierry and explain their need for a new system. After the initial phone call, they would wait for Thierry to outline the project objectives in a textual document sent through e-mail. The SIT team and its clients would then discuss this document in a joint meeting that launched the project. Based on these early discussions, SIT members would then revise the textual document and exchanged it with clients through e-mail. Throughout the project, requirements documents were exchanged between team members and clients through e-mail and then discussed in meetings.

In general, SIT members were satisfied with the way projects were being managed. People such as Thierry valued being recognized as important intermediaries between project teams and their clients, but occasionally complained about work overload as their help was requested for many projects. Albert notoriously promoted teamwork and intense informal communications among his employees and with clients. As for clients, most of them appreciated SIT's way of keeping them involved for the duration of the project and were happy with the systems they received. Even when the IT department took a lead in making project decisions (such as technical architecture selection), clients felt that these decisions were made with their best interests in mind. Occasionally, there were serious disagreements between SIT and its clients, but the special intermediaries were generally able to resolve the conflicts. Some clients, who did not have a "special intermediary," complained about the discrepancy in the way IT treated client departments. Such clients believed they had to wait longer, had a harder time expressing their requirements, and, at times, received systems that did not match their needs.

Analytical Summary

Traditionally, the boundary-spanning practices between teams and clients were community-like. The reproduction of these relations was highly embodied because of the involvement of boundary spanners such as Thierry, Veronique, and Philippe, all of whom negotiated the emergence of joint interests between teams and clients. Boundary spanners, who were legitimate peripheral participants in both SIT and its clients' fields, were able to "translate" the differences in perspectives between clients and SIT [14, 36]. During this process, well-known conflicts arose between technological constraints and clients' wants (e.g., [19]). Boundary spanners negotiated solutions that "transformed" [14] the practices of both parties so as to accommodate each other's interests in building a new system. From boundary spanners' personal involvement, a new joint interest emerged between team members and clients that subsequently relied on embodied relationships.

Regarding IT use, team members used the e-mail system in ways that supported these mostly embodied community-like relationships by reducing the cost and increasing the convenience of sharing the boundary objects (e.g., drafts of requirement specification documents), whose meaning was then mutually negotiated during meetings. Moreover, boundary spanners used e-mail to sustain personal relations with clients. Rather than depersonalizing interactions, ServCo's e-mail was used for "hyperpersonal" interaction [61]: had the specific individuals who used it been replaced by others, the content of the communication would have lost its meaning.

The Redesign: Increased Objectification of Practices

By mid-1998, Albert resigned because of poor health; Peter, his successor, arrived six months later. Peter decided to drastically reorganize SIT and, in particular, to stream-

line project management activities.[4] Peter's reorganization introduced formal rules and a strict definition of stages and tasks of project management. Project teams were restructured so that, instead of informal, self-organizing teams focusing on specific client departments, formal groups were now organized around the design, implementation, and maintenance of specific technologies (e.g., Unix servers, new media). Within the new service teams, responsibilities were clearly delineated, and IT department's permanent employees worked in "design subteams" while temporary workers worked on the "implementations subteams."

The relations between SIT and its clients were also transformed. Peter decided to implement a new, intranet-based, application called "Clients' Project Management" (CPM), which became available at the beginning of year 2000. The CPM application was a typical workflow management system that kept track of the completion of various project steps and sign-offs. The new policy made using the CPM application compulsory for starting and managing new projects that demanded a workload of less than 10 people per day.

Through the CPM, clients expressed their requirements by filling out forms requiring them to specify their needs in technical terms (e.g., "approximate capacity of applications"). Upon receipt of the form, project managers, who were now assigned on the basis of their formal IT and project management training, acknowledged receiving clients' requests and replied with a project proposal via the CPM application. The proposal and clients' requirements were processed by the design subteam members, who would then prepare a prototype. The project manager then sent prototype specifications back to the clients through the CPM application; an automatic acknowledgment of receipt would then follow. Business clients reacted to the proposed specification via the CPM application as well. Once clients accepted the design, its specifications were sent via the CPM application to the implementation subteam that was in charge of implementing the new system.

As the use of CPM application increased, the involvement of special intermediaries such as Thierry, Veronique, and Philippe in relationship management decreased. These people were now assigned specific design tasks and were no longer responsible for interacting with clients. They certainly kept their informal relationships with members of their former department, but their informal exchanges did not affect project work in a significant way. Veronique, for example, no longer worked with the legal department. Philippe decided to take an early retirement because he lacked the formal training needed to be appointed a project manager and wanted to take a regular coding position. The newly appointed project managers were in charge of overseeing the progress of the project and the relationships with clients. They verified that clients and project teams fulfilled obligations recorded in the CPM in due time but did not engage clients in discussing specifications.

Clients usually restricted their attendance to project launch meetings. All the other project meetings were attended only by the SIT members. Limiting the number of meetings between SIT and clients was, for Peter, a way of increasing "real work" time (i.e., less time lost in mere "babbling").

Analytical Summary

The redesign initiated a drastic shift from a highly embodied mode of producing boundary-spanning practices to one that was largely objectified. The redesign specified how each party (clients, project manager, design, and implementation subteams) was to engage in a relationship with strictly delimited roles and responsibilities.

The CPM application was used to support the increased objectification of the relationships between clients and project teams. It was used to encode these newly objectified roles and responsibilities. Its use also contributed to the replacement of boundary spanners such as Thierry, Veronique, and Philippe. Because new management believed these agents' role was to "carry objects" back and forth between clients and SIT, they appeared virtually redundant after the adoption of CPM.

The new project managers were nominated to maintain the client relationship. In practice, they were to be brokers who were responsible for connecting business units and assuring timely compliance with the assigned tasks. Thus, clients' IT applications were no longer coproduced. Instead, clients produced their objects (the requirements and payments) and IT professionals produced their objects (role assignments and software applications). There was little iteration around the design as each party worked on their objects sequentially.

The Impact of the Redesign

As Peter anticipated, efficiency increased: on average, projects were delivered 1.5 days faster and with 20 percent less cost. Peter was fully satisfied with the redesign and performance of SIT.

The redesign of SIT also transformed the way IT professionals approached their job. Members of the design subteam, in particular, maintained that their tasks and accountability ended with the design of the new system. Most of them appreciated that the use of the CPM application relieved them of having to constantly take into account clients' needs. Moreover, they could invoke written traces left by clients in the CPM applications to resolve disputed systems requirements, as illustrated in the following quotation from Sandra, a member of the Unix server design subteam:

> With our clients, I work a lot through e-mail and through the intranet application [the CPM application], as the relationships between my department and our clients is not always full of mutual trust. It is good to keep written notifications, to keep traces, so that we can always show them what they asked from us.
>
> When asked if the CPM application improves project management, Sandra asks that the tape recorder be stopped. Off-record, she comments [rewritten from notes]: "With the CPM, it is none of my business whether clients like the system or not. We [the design subteam] do what we have to do, what they [the clients] ask us to do. Once we have done our part of the deal, it's time for the temps to work."

As for clients, some of them expressed their satisfaction with how the new CPM-based project management approach treated all clients "equally." Nevertheless, clients were rather dissatisfied with having to use the CPM application and with the resulting deliverables. They found the fields used in CPM forms confusing because they were written in a technical language unfamiliar to them. They also found no room in CPM for discussing the choices of technological platforms (Peter believed it was SIT's decision to make). For example, the HR department wanted a new Web-based groupware system but, instead, received a shared folder on a mainframe system. Ironically, the shared folder satisfied the formal requirements that an HR manager documented in CPM.

Initially, members of the implementation subteams were the only IT people who confronted clients' dissatisfaction. They sometimes provided "undercover" fixes to accommodate clients' most pressing needs. Yet they did not see it as their responsibility to communicate clients' dissatisfaction about specific issues to the design team.

As a consequence of clients' growing dissatisfaction, in mid to late 2000, clients convinced the chief executive officer (CEO) to authorize outsourcing of system development projects to external vendors instead of relying on SIT's business. Clients found that external vendors provided IT solutions better suited to their needs. As demand for new project requests from SIT waned, the SIT was deeply reorganized at the end of 2000: Peter had to resign, temporary workers were no longer hired, and many IT professionals were relocated to clients' departments while the ones remaining at SIT were in charge of routine maintenance requests that still relied on the use of the CPM.

Analytical Summary

As expected, the new objectified boundary-spanning practices resulted in project management that was more efficient. However, the delivered results no longer met clients' needs. While the new systems fulfilled the obligations SIT had to clients, according to CPM forms, they did *not* match clients' needs with respect to functionality or usability—a well-known phenomenon in IS practice [19].

Moreover, relationships within SIT had become more objectified as the design subteams sent their designed systems to the implementation subteams without sharing responsibility for the final outcome or soliciting feedback.

Dissatisfied with the relationships with SIT and with the delivered systems, clients decided to transfer the market-like boundary-spanning practice with SIT to actual contractual relationships with external vendors. The activities of the newly shrunk SIT centered on maintenance operations of the kind that did not require extensive collaboration with clients.

Discussion

DISCUSSING THE SIT CASE HELPS further our understanding of how the nature of boundary spanning changes as IT use gets incorporated into everyday practices. We

treat SIT's case as a case of increased objectification of intraorganizational boundary-spanning practices. In what follows, we analyze the process through which CPM use influenced such transformation and then outline the main organizational impact of the transformation.

The Process of Transformation

In conceptualizing *how* the use of IT triggered increasing objectification of boundary-spanning practices, we demonstrate how it contributed to changes in the whole boundary-spanning practice, including the role of specific agents and the nature of face-to-face interactions.

Table 2 summarizes how various aspects of boundary-spanning practice (i.e., intermediaries, objects, meetings, and IT) before and after the redesign supported either community-like or market-like relationships. While we know that IT use can lead to very different consequences and could strengthen community-like boundary-spanning practices [36], in the SIT case, we saw how IT use as a medium for sharing objects reinforced the transformation of practices toward the objectification end of the continuum depicted in Figure 1. In particular, a specific feature of IT use, namely, that it *allows sharing objects without reliance on individuals* to "carry them across boundaries" played a crucial role. At SIT, this CPM feature contributed to the changing role of intermediaries. Because boundary spanners were no longer needed to exchange objects, the relationship became less embodied. Mundane features of face-to-face interaction such as facial expressions and a sense of touch, which can be critical for building and sustaining interpersonal relationships [40], were gone.

On the other hand, the SIT case also suggests that, without the related changes in other aspects of boundary-spanning practice, the CPM by itself was unlikely to transform practices to such a profound degree. For example, if former boundary spanners maintained their roles as individuals responsible for informal client relations, dialogue about system specifications would likely have emerged. CPM was more likely to have been used to record and validate actions already taken through other medium (such as the early stages of IT use described in [7]).

Thus, we conclude that the use of IT does not always generate increased codification. Instead, IT use may reinforce other aspects of boundary-spanning practice that produce objectified relations. This proposition is not made in support of technological determinism as agents may always choose to subvert management and use IT in unintended ways [7, 32]. More modestly, this discussion suggests that inflexible workflow management systems such as CPM are more likely to propel the evolution of market-like practices as compared to e-mail or collaborative group decision support systems (GDSS) used for requirement determination [20].

Impact on Business Relations and Outcomes

In terms of effects of increased objectification with IT use, the SIT case illustrated a situation in which, consistent with Bourdieu's practice theory, changes in practices

Table 2. Diverse Uses of Boundary-Spanning Mechanisms

Aspects of practice	Before the redesign: community-like practices	After the redesign: market-like practices
Intermediaries	Boundary spanners act as integrators who build a community around new joint interests.	Brokers connect diverse agents, negotiate the terms of the object exchange, and ensure fulfillment of mutual obligations.
Objects	Boundary objects are coproduced. They represent negotiated outcomes of a joint practice.	Objects are separately produced and exchanged according to prespecified terms.
Meetings	Facilitate the coproduction and negotiation of objects (e.g., brainstorming meeting).	Facilitate the exchange of objects and the negotiation of terms of the exchange (e.g., project status meeting).
IT use	Supports interpersonal relationships: replace people, and the content of communication will lose its meaning.	Supports an exchange of objects: replace people, and the content of communication will be easily reinterpreted by the new people enacting the same roles.

generated changes in the relative positions of SIT and its clients. IT as a medium for object sharing again played an important role in this transformation: *the new power structures became more visible with the use of IT* [10, 55]. Not only, as Bourdieu argued, can objectified relationships be more easily challenged, because they are elevated to the level of consciousness, but also, with IT, the objects representing relationships are more easily accessible to many users. For example, the fact that in CPM, clients had no place to suggest which technological platform they preferred was visible to everybody. Previously embodied relationships were more opaque: IT often guided clients' choices of technological platforms during Albert's tenure, but this guidance was subtle. The increased objectification of the boundary-spanning practice was eventually rejected by clients because they realized new practices put them at a heavy disadvantage vis-à-vis SIT. The clients then appealed to the CEO with concrete "objectified" evidence and acted to transform market-like boundary-spanning practices within organizations into a real, market-based exchange with vendors.

Contributions and Implications

Summary of the Key Points

IN THIS PAPER, WE DREW ON BOURDIEU'S ANALYSIS of the modes of practice production and the genesis of boundaries to better understand how IT use shapes boundary-spanning practice. We identified two modes of practice production (embodiment versus objectification) and identified two types of boundary-spanning practices based on these modes. We argued that a community-like practice was distinguished by a joint engagement of agents in the production of shared objects, while a market-like practice consisted of exchanging separately produced objects. Our analysis of data from one in-depth case revealed how the use of IT, along with the transformation of other aspects of the boundary-spanning practice, led to a drastic change from the largely embodied to the largely objectified practice. We explained this transformation in terms of the alignment of multiple aspects of the boundary-spanning practice and in terms of the deterioration of interpersonal ties as a function of a decoupling between the sharing of objects and interpersonal interactions.

Limitations

Our approach has some limitations, however. Most notably, it relies on a single, albeit in-depth, case study, thereby limiting the empirical generalizability of our observations. Moreover, the SIT case may be particularly idiosyncratic in that the practices were transformed almost overnight. In many other cases involving the introduction of IT, a more gradual and less deliberate change is observed [3, 42, 47]. However, the extreme nature of the case is similar to a Weberian "ideal type," which highlights the essence of the phenomenon. Finally, we realize that differences in features between the e-mail system that was used before the redesign and the workflow system that was

used after the redesign limits our ability to compare two technologies. Other studies should explore the relationship between the features of the technology and the transformation of boundary-spanning practices to address this limitation.

Nonetheless, even with these imitations, this research offers important contributions to the IT and organizational literatures and implications for research and practice.

Implications for Research

This paper's most important research contribution is the development of a conceptual apparatus for understanding how IT is used in transforming boundary-spanning practices from community-like to market-like ones. The transition we observed in the SIT case was similar to the transition in the case described by Schultze and Orlikowski [51], where Internet-based, self-serve technologies were introduced into the relationship between an organization and its customers. At the same time, the SIT case described here contrasts significantly with the Insura case described by Levina and Vaast [36]. In the Insura case, the intraorganizational boundary-spanning practices (between geographically dispersed teams) changed over time as a new intranet-based IT application was used to create more personal relationships among remote agents. Our conceptual development helps connect these inter- and intraorganizational settings and sees all of these cases as examples of a change in the degree of objectification versus embodiment in boundary-spanning practices. By viewing IT as a medium for sharing objects, we have shown how IT use influences the mode of practice production and either reinforces institutional boundaries or helps bridge them.

Future research studies can explore the parallels between the use of IT for supporting highly embodied relationships in diverse settings and the use of IT for supporting highly objectified relationship in diverse settings. Which features of IT use help foster hyperpersonal communications in such diverse settings as collocated work teams, online communities, and cross-boundary fields? In terms of supporting the objectified mode of practice production, we have identified two features of IT use that played a significant role: (1) the decoupling of the object exchange from interpersonal ties and (2) the increased visibility of power relations to a greater number of stakeholders. Are these features important in supporting the objectified mode of practice production in other settings such as electronic marketplaces and Tayloristic manufacturing production, and are there other important features that play a role?

We have also demonstrated that IT use did not transform practices by itself but, rather, was part of a complex series of changes in practice that included the role of intermediaries, objects, and face-to-face meetings. Prior organizational literature refers to these multiple aspects of practices as "mechanisms" for boundary spanning. As such, it often sees one mechanism as an alterative to another. For example, researchers have argued that IT may be used to replace boundary spanners with boundary objects [37] and have debated whether one mechanism is better than another. Some researchers [14, 53] have argued that boundary objects are a superior alternative for boundary spanners, whereas others [24, 25] have argued that boundary spanners and the relationships among them are the most preferable integration mechanisms.

The focus on the degree of objectification versus embodiment involved in practice production allows us to see these so-called mechanisms as different aspects of an integrated practice that take on different shapes rather than replace each other (as illustrated in Table 2).

The interdependent changes in the diverse aspects of boundary-spanning practices gives further support to the "relational thinking" that has been emphasized by Bourdieu and other practice theorists [44]. Relational thinking develops an understanding of social dynamics from the relationships between agents and social groups rather than from their individual properties [44, p. 93]. Here, we saw how the use of a new IT had an impact on other aspects of boundary-spanning practices; that impact reflected a type of "chain reaction." By changing the medium through which agents shared objects, IT use also changed the positions of individuals and groups in practice.

Finally, our framework contributes to the literature that highlights contradictory consequences of IT use within and across organizations [43, 48]. Robey and Boudreau [48] have identified four theories (organizational politics, organizational culture, institutional theory, and organizational learning) that can be used to describe the "logic of opposition" in accounting for the contradictory consequences of IT. We found Bourdieu's practice theory and the dialectic between embodiment and objectification particularly useful in understanding the contradictory consequences of IT in boundary-spanning practices. Future research studies may want to contrast the analytical power of the perspective that we used with the one or more of the perspectives proposed by Robey and Boudreau [48].

Implications for Practice

Managers can benefit from gaining a further understanding of the process through which IT use is incorporated into boundary-spanning practices. First, the very nature of the practice may change, either reinforcing institutional boundaries or supporting the emergence of the new joint field. Second, IT use can reduce the cost of reproducing boundary-spanning practices across projects, but it may also lead to undesirable, local transformations because of the increased objectification. At ServCo, with the objectification of the relationship, it became clearer to business clients that they were disadvantaged by the new system, and they started seeking alternatives.

There are also certain strategic implications that stem from our framework. It has already been pointed out that different uses of IT are more suitable for supporting strategies based on community-like versus market-like business relations among organizational units and across the organizational boundary [6, 23, 27]. Schultze and Orlikowski [51] illustrated how the introduction of a self-service technology undermined a company's strategy by eroding organizational competence in providing a highly personal customer experience. We provide further support for these arguments but also illuminate why organizational strategists should *simultaneously* pay attention to the IT use and other aspects of practice, including the nature of intermediary roles and the choice of individuals who play these roles. For example, a person who was an excellent broker of connections may be an inappropriate leader for building

communities [18]. Innovative strategies may also emerge from experimenting with "hybrid" modes of boundary-spanning practices that are located toward the middle of the objectification/embodiment continuum.

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Notes

1. We adopt the concept of "field-of-practice" as opposed to the "community-of-practice" because it provides the theoretical apparatus necessary to explore the boundary-spanning practices and associated power relations.

2. We briefly note two points about the terminology. First, these two notions are echoed in Wenger's [62] notions of "participation" and "reification." Second, in this paper, the meaning of what we call the "production" of practices refers to the generation, regeneration, and transformation of practices through human action.

3. Although, strictly speaking, this research was not drawing on critical hermeneutics used by Klein and Myers [30], their principles are similar to the principles advocated by Bourdieu and Wacquant [9] in conducting inductive ethnographic work. Bourdieu's principles, however, are abstract and targeted toward conducting large-scale sociological studies. Thus, in this study, Klein and Myers's [30] principles were followed as a practical guidance.

4. Details about Peter's reasons for these changes can be found in Vaast and Levina [58].

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Appendix Table A1. Klein and Myers [30] Principles' Application

Klein and Myers [30] principles	Application in the analytical process of this research
Hermeneutical process This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form.	The investigation process aimed at understanding IT use within its context of use and at understanding how the "impact" of IT use on the building of boundaries was related to the overall organizational context, existing work practices, and power relations at SIT and ServCo.
The principle of contextualization Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged.	Even though the field researcher arrived after a major organizational change took place, she made a concerted effort to ask participants about the situation before the change in management. She also sought out and informally interviewed members of SIT who left the department.
The principle of interaction between the researchers and the subjects Requires critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and participants.	The field researcher had been allowed to observe SIT's organization and practices for the CIO expected "validation" of his methods from the field researchers' observations. The field researcher soon became aware of her particular interpretation that was suggested to her by the CIO. She sought alternative interpretations of the case by submitting her "raw" case description to academic colleagues and various study participants for alternative interpretations.
The principle of abstraction and generalization Requires relating the idiographic details revealed by the data interpretation through the application of principles one and two to theoretical, general concepts that describe the nature of human understanding and social action.	Case analysis was grounded in ServCo's specific context, but it was also confronted with general concepts such as the emergence of shared meaning of their experiences among community members and joint interest in guarding community boundaries. Bourdieu's theory was used as a basis for abstract theorizing.

The principle of dialogical reasoning Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ("the story that the data tell") with subsequent cycles of revision.	Initial research design was guided primarily by the preconception that IT can preserve or transform interorganizational boundaries. Our initial agenda of showing this as an "IT-centric transformation story" was soon disassembled because we clearly saw that IT use was part of many practices that new management implemented to change the organization. This led us toward shifting the agency away from IT use toward a more holistic picture of organizational change.
The principle of multiple interpretations Requires sensitivity to possible differences in interpretations among the participants as are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it.	The field researcher strategically looked for alternative interpretations of the change by talking not only to the person responsible for the redesign and his or her close allies but also by informally interviewing temporary workers and clients. Through their stories and informal encounters in the field, the field researcher learned that many people disagreed with the "official" view of the change.
The principle of suspicion Requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants.	Not only did the data collection strive to get insights from a variety of parties, but the two authors and study participants challenged the emergent interpretation by undertaking critical readings of case narratives.