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## Intranet Boundaries: Social Actors and Systems Integration

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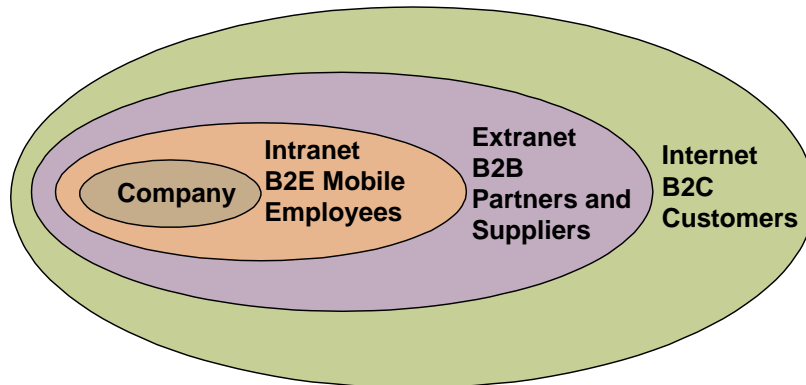
### Abstract

*Systems integrations (SI) have been examined from two main vantage points. External B2B SI has focused primarily on transactional interactions between customers and suppliers in the value chain. Internal intra-organizational SI has focused on structural interactions between functional units of the firm. Both approaches present problems for intranet integrations that serve communities of practice which often cross organizational boundaries, and that support non-transactional types of interactions. In this paper, I present four vignettes of intranet integration that highlight the value of a project-based approach to SI, and also suggest how a newly developed framework for social actor analysis can help to foster that approach.*

### 1. Introduction

Popular conceptions of e-business systems integrations often begin with the assumption that each firm has “a system” that needs to be integrated in some way with “the system” of one or more firms. In truth, most firms have many systems, each one of which may serve a particular community of practice within the firm, and each one of which may benefit from a very different kind of integration within the firm, and with other firms (Damsgaard and Truex, 2000.) More sophisticated models of e-business information systems see the firm as being composed of a set of nested systems, each of which may serve a particular function within the firm

with a natural set of integrations within the firm, or with the firm's clients or partners. (See Figure 1.) This kind of modeling begins to capture the complexity of organizational integration opportunities, but still harbors the bias that a single, integrated information system exists at each level. So that, for example, business-to-business ( $B_12B_2$ ) interactions might involve multiple  $B_2$ 's (with a generic or configurable interface), but a unified  $B_1$  (with one firm-level interface.)



**Figure 1:** *Internet-Based E-Business Opportunities for Connectivity and Coordination (adapted from Dyson, 2001.)*

For transaction-based systems integrations with customers and suppliers, this model may be adequate. But for non-transactional systems, it does not represent the multiple opportunities for integration across communities of practice within the firm or external to the firm. In my intranet studies, for example, “The Intranet” doesn’t exist. In its place I find many loosely connected “intranet islands” that offer opportunities for integration across organizational boundaries where integration must be flexibly negotiated (Lamb and Davidson, 2000.) Such integrations differ not only from common conceptions of integration within the firm, but also from common transaction-based conceptions of B2B systems integration, as well. Firms that *collaborate* may actually partner across some units while at the same time competing across others.

Sharing an intranet is fundamentally different from developing an extranet, in the types of information and applications that can be shared, in the technical mechanisms and protocols needed to protect shared and non-shared intellectual property, and in the scope and duration of shared access. Collaborative integrations among partners and key clients need to be negotiated with the awareness that they will be multiple and changeable. And within firms, systems integrations could benefit from a similar awareness – particularly in industries where frequent mergers, acquisitions and divestitures dramatically alter internal structures.

In this paper, I examine the dynamics of e-business systems integrations by focusing on one system type (intranets) and two kinds of integration ( $B_12 B_1$  –

internal integrations, and B2P – external, non-transactional, business-to-partner integrations). To preface further discussion, I describe four intranets and their associated integration opportunities, attempts, successes and failures, highlighting the basic characteristics of non-transactional interactions. These vignettes suggest that project-based integrations across communities of practice can offer exemplary models for reconceptualizing flexible e-business systems integration. The intranet focus, specifically, sharpens our appreciation for understanding B2P integrations that span communities of practice, while in the process they are reshaping e-business technologies and challenging traditional firm boundaries.

## **2. Pros and Cons of Integration**

Much of the academic and practitioner interest in external systems integration (SI) has been focused primarily on transactional interactions between firms as customers and suppliers in the supply chain (Brooks and Dik, 2001) while internal SI has focused on improving structural interactions within the firm as efficient coordination among functional units (Truman, 2000.) In many firms, business units are treated as customers and suppliers to one another, and business process improvement goals center around increasing the effectiveness of transactions between pairs of units (Berman, 2000.)

Business process re-engineering efforts (BPR) have concentrated on revamping internal processes, and realigning interorganizational relationships to maximize transactional opportunities and efficiencies for the firm (Larsen and Myers, 1997.) Since the early 1990's, the imperatives of enrolling information and communication technologies (ICTs) in this project has dominated the discourse about SI (Al-Mashari and Zairi, 2000.) A transactional integration approach is appropriate for certain kinds of exchanges, but, as later examples will show, it presents problems for intranet integration opportunities, which are largely project-based collaborations. Researchers who have specifically contemplated the evolution of intranets and extranets have speculated about potential emergent forms (Riggins and Rhee, 1998), but these don't clearly differentiate between bases of interactions (e.g. transaction, project, structure) and integration dimensions (e.g. duration, inclusion, cardinality). Research that is currently focused on classifying the coordination needs of firms could help make needed clarifications (Reimer et al, 2001), but associated attempts to set international integration standards and terminology will meet predictable roadblocks (Kosanke, 2001; cf. Hanseth and Braa, 1999.)

In general, more attention is given to the 'pros' of B2B integration than the 'cons', in part because of the expectations for profitable gain that have resulted from successful supply chain integrations through high-profile EDI (e.g. Ford (Akasie, 2000.)) and BPR transformations within the firm (e.g. Dell (Shah, 2001.)) There is a general perception that integration is always a good thing to have *within* structural

boundaries coincident with the organization, and that it is nice to have at the industry level, too – although this is generally seen as much more difficult to achieve (Giesbers, 2001)

When SI ‘cons’ are addressed, the discussion usually concentrates on the failings of a particular approach to B2B SI for certain pairs or groups of firms (Damsgaard and Truex, 2000; Larsen and Myers, 1997.) These discussions carefully examine the difficulties and costs, while still seeking a way forward for increased integration. In IS journals, there are as yet no Feyerabends crying out “against integration.”

In this paper, I won’t try to construct a radical view of SI, but I will begin developing a theoretical perspective around SI that includes non-transactional types of integration, and that also incorporates the notion that integration must be reversible or deconstructable at critical junctures to support a common range of interorganizational interactions. Little research attention has been given to disintegration, reverse integration, or the unpacking of integrated systems – there isn’t even a good term for it. The need often coincides with divestiture or decentralization, but these terms don’t adequately incorporate the complexities of extracting embedded information infrastructures in ways that support autonomy and/or new integration opportunities (Wouters et al, 1999.) Since much of the business process-related discussion about integration revolves around cost-effectiveness, and efficiencies that reduce duplication of effort, and since practitioners know too well that integration is expensive and often difficult to achieve and maintain, it may be counter-intuitive to design-in the ability to deconstruct it. Technical discussions, however, take for granted the need to decompose and salvage parts of complex systems. Object oriented (OO) approaches to system design and implementation have made it standard practice to anticipate the reuse and reconfiguration of technical components (Hasselbring, 2000).

Better project-based approaches to SI are not, however, merely a matter of applying OO concepts to communities of practice and their intranets. But constructivist concepts can shed light on the opportunities and practical pathways toward negotiated integrations that interlink the environments, affiliations, interactions and identities of organizational actors.

### **3. Intranet Insights**

In prior research, I have found that grass-roots initiated intranets are very common within firms, and that they are among the most well-used sites within an organization; but that usefulness is limited to participants within the formative intranet community of practice (Lamb and Davidson, 2000.) For example, a manufacturing plant may construct an intranet to support its ISO-9000 quality management documentation, and the site may be heavily used by personnel at the plant. Making it accessible throughout the firm, however, is unlikely to achieve

much practical knowledge sharing, since most plant operations are unique and process documentation is highly specific (Lamb, 2001.) Within manufacturing firms, IT personnel have made various attempts to “integrate” these intranets with the belief that wider sharing of intranet content with those not local to the content development will benefit the firm as a whole, but also with the hope that by imposing some standards, the integration will lessen demands on thinly-stretched IT resources.

Most intranet integration efforts are look-and-feel oriented, so that “outsiders” within the firm will more easily find what they seek. In practice, however, outsiders make very little use of grass roots intranets since they are by definition outside the community of practice. Pragmatically, most companies’ IT departments have tempered their attempts to achieve full integration, electing instead to pursue integration at the intranet hardware and software level (i.e. tcp/ip networking, basic internet technology applications—ftp, http, smtp; and a basic but expandable client desktop); and to leave intranet content and intent in the control of local business units. They have discovered (again) that, although standards may be a precursor to integration, standards aren’t universal, and they don’t create order (Hanseth and Braa, 1999.) What starts out as an archipelago of intranet islands will not become an integrated repository for knowledge sharing just because the pages follow a standardized format and predictable navigation. For IT groups and their business managers, this raises a question about the need to unlearn what they “know” about integration goodness—a question I will take up in earnest later in the paper.

A key finding about grass-roots intranets is that intense use occurs when business unit members take on multiple roles with respect to the design, construction, maintenance and use of the technology—in addition to their normal daily tasks. When the quality control manager, for example, assembles a team to support the intranet development project, and when his process owners write up the documentation, save it in HTML format and submit it for online access, and when his shop floor operators provide feedback for updates in daily use, the intranet becomes part of how they do things. It’s part of who they are. It’s *their* project. In a related study that examines the role of ICTs among industry and academic scientists, this phenomenon is even more pronounced (Lamb and Davidson, 2002.) Project-based interactions and project-based identities may allow for project-based integrations; they may also thwart integrations that are based on organizational structure or on transactions, as later examples will show. Other researchers have noted the propensity for multiple, conflated roles (e.g. user-builder-engineer) in the successful implementation of new organizational technologies (Yates et al., 1999), but they have not tried to tie these findings to a theoretical conceptualization of ICT-enabled individuals.<sup>1</sup>

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<sup>1</sup> Actually, Castells (1997) does describe project identities as an important social transformation in *The Information Age*, but his “projects” differ from what I describe here. For Castells, the projects that shape peoples’ identities are grand-scale social projects and movements—like women’s rights, environmentalism and religious fundamentalism. From my studies, however, I

Insights from this line of research have led toward the conceptualization of a multi-dimensional social actor (Lamb and Kling, forthcoming.) The social actor model is a ‘currently modest’ but ‘hopefully ambitious’ attempt to develop an empirically grounded characterization of organizational individuals, that can help frame analyses of integration and shape practical strategies. Its primary strength is the way that it integrates organizational individuals, their informational environments, and their ICTs. Other analyses have focused on particular aspects of the social actor. Geser (1992), for example, has treated the organization itself as a social actor to examine collective action and to explain the dynamics of multiple, simultaneous, often conflicting, interactions among organizational actors and between their internal sub-units. Munck (1995) has also theorized about collective action by considering social movements to be social actors that interact with existing institutions through the efforts of movement organizers to develop strategies and build movement identity. Our own approach retains this focus on interconnection and action, but more closely follows Touraine’s general method for studying social actors (2000) by allowing the social actor unit to vary in accordance with self-representation (i.e. as an individual, a group, an organization, or a social movement) and relationships to other actors.

Thus far, we can describe four dimensions that characterize a social actor (see Table 1.) These dimensions connect actors to networks and environments, and explain ICT use as integral to interorganizational interactions. The social actors we seek to characterize may be professional individuals performing a role, groups of firm members acting in concert, or organizations interacting with industry regulators. Social actor affiliations are networked, exchange-related, multiple and changing. Their environments are technical, institutional, ICT-enhanced, and expansive. Social actor interactions are legitimate, action enabling, constructed, and role-based. And social actors continually reconfigure their roles to reconstruct and represent themselves as competent, ICT-savvy social actors. The social actor model acknowledges that the world is changing, and that globalizing phenomena strongly influence organizational relationships. Technology, particularly information and communication technology, is not a tool anymore, it’s an environment – a networked, informational environment.

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would say that people find very much of their identity in smaller, more modest “projects” like the ones I describe here.

**Table 1: Multi-dimensional Characterization of a Social Actor (Lamb & Kling, forthcoming)**

SOCIAL ACTOR DIMENSIONS	CHARACTERISTICS for a connected and situated individual
Affiliations	Social actor relationships are shaped by networks of organizational affiliations
	Relationships are dynamic, and related informational exchanges change with “flows” of capital, labor, and other resources
	Relationships are multi-level, multi-valent, multi-network (i.e. global/local, local/global, group, organization, intergroup, interorganization, culture)
	As relationships change, interaction practices migrate within and across organizations
Environments	Organizational environments exert technical and institutional pressures on firms and their members
	Environmental dynamics vary among industries and institutions
	ICTs are part of the organizational environment
	ICTs are part of the industry/national/global environment
Interactions	Organizational individuals seek to communicate in legitimate ways
	Organizational individuals build, design, and develop interactions that facilitate “flow” changes
	ICTs become part of the interaction process, (“interaction technologies”) and people transform and embed available informational resources into connections and interactions
	As firm members, people perform socially embedded (role-based), highly specified actions on behalf of the firm
Identities	Social actor identities have an ICT use component
	ICT-enhanced networks heighten ethnic and multiple other identities (global/local tension)
	ICT-enhanced connections among firm members transcend roles
	Social actors use ICTs to control identity perceptions

The social actor model provides a framework for characterizing particular collaborations and coordinations that cross boundaries. Such *interactions* are, in fact, the main focus of this paper. When developing and using intranets, organization members are constrained and enabled by the industry environments and specific interorganizational affiliations of their firm. They use intranets and other ICTs as they enact these associations, and over time, these technologies may become part of the interactions -- part of the routine way of doing things. People may strongly identify with the technologies they build and use, including ICTs (e.g. "I am the Toxic Chemicals KnowledgeBase guy.") How one sees intranet integration opportunities and problems, therefore, will likely depend on who you are as a social actor – your social actor view. Among academic researchers like oceanographers, project-focused identities are seen as “normal”. Within a firm where multiple factions vie for managerial control, or where frequent mergers and acquisitions result in several layers of organizational segmentation, project-based identities may be seen as too balkanizing and may “trigger” a reaction for more integration. More robust examples will better clarify how the social actor model



can help to characterize integration interactions. So, after a brief description of the intranet study methodology, I will present four examples of intranet integrations, and then use the social actor model as a guide for understanding project-based interactions.

#### 4. Study Design

My findings about intranet integrations are based on data collected in an ongoing study of intranets in mid-west U.S. companies.<sup>2</sup> To date, over 250 firms in five industries (manufacturing, law, health care, real estate, restaurants)<sup>3</sup> have been queried about their intranet development and use, and over 50 organizations have been visited to further examine their intranets. The study is being carried out in three phases:

- 1) industry surveys to determine which firms have intranets, for how long, and for what general use; followed by site visits to a few firms;
- 2) in-depth case studies in each industry to further examine the context of use and the contents of the intranets; and to determine what influences intranet development and use;
- 3) and visits to organizations and institutions that seem to influence intranets in the case study sites to verify that influence and to understand how those firms or individuals use intranets themselves.

In-depth onsite studies have been conducted at a Fortune 500 manufacturing firm, a prominent international law firm, a large health care services provider, and a commercial real estate firm. In each industry, intranet adoption, development and use data are collected through interviews, and through direct examination of intranets and intranet logs, development guidelines, intranet component samples, and related documentation. These diverse data sets are analyzed using qualitative methods for thematic coding and data reduction for cross-case comparison (Lofland and Lofland, 1995; Strauss and Corbin, 1990; Miles and Huberman, 1994). The analysis is guided by theoretical insights about informational environments derived from prior research (Lamb, 1997), and by a constructivist view of social actors in organizational contexts (Lamb and Kling, forthcoming). One goal of the study is to identify emerging trends related to intranet adoption and development that are evident in different contextual settings and to assess how trends may be evolving across contexts and over time. Based on prior online studies, I expected to find that

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<sup>2</sup> See Lamb (1999) for an extended description of the study, study methods and research goals.

<sup>3</sup> The industries under study span the range of industry environments dimensioned by Scott (1987).

most hospitals would show intensive use of intranets, most restaurants would show minimalist use of intranets, and that firms in the other industries would fall somewhere in between -- varying largely because of their interorganizational relationships. This interorganizational focus has posed some interesting questions about systems integrations that I will explore through a series of four vignettes.

## **5. Four Vignettes about Integration**

The first two stories involve internal integrations, and the second two involve external integrations. They are meant to serve as exemplars for typical intranet integration efforts, but they are not held up as representative in any statistical or industry-related way.

### **5.1 Manufacturing Conglomerate (MC1 and MC2)**

This story is about an internal integration that, fortunately, failed. Manufacturing Conglomerate (a pseudonym) is a Fortune 500 company with headquarters in the mid-west US. This organization has grown over the last decade, through a series of acquisitions and mergers, into a firm with two very different areas of manufacturing expertise (MC1 and MC2.) At the beginning of this study (1998), over 15 intranets were in use within the company. Most were linked together and protected by a common firewall. However, a few of the more recently merged MC2 firms were still operating on different networks and their intranets were not accessible by others in the larger organization, due to difficulties in reconfiguring firewalls and perceived restrictions on sharing intranet information. Some of the fully accessible intranets served MC1, others served MC2, but none had been designed for a corporate-wide audience. To help ease the growing pains, Manufacturing Conglomerate's new CEO wanted to communicate a strong message throughout the firm: "We are one company!" He envisioned that a corporate intranet would be an effective mechanism for sending his message, and in 1998, a corporate-wide committee was convened to develop an intranet integration plan. The goal was to create a new Corporate intranet that would eventually replace the disparate intranet islands throughout the firm. Soon afterward, yet another merger was announced. A few groups in MC1 proceeded with limited integration of a small number of closely related intranet projects into a divisional intranet. In late 1999, when Fortune began a merger with an even bigger competitor, the committee suspended its corporate-wide effort, waiting for a more opportune and stable time to try again. That "stable time" has not yet arrived. In early 2001, MC1 (at one time the main focus of the company) was sold to a private investment firm, and those business units lost access to all but the data on their local intranet servers. There is no longer a need to communicate the "we are one company" message across two very different

manufacturing divisions, because Manufacturing Conglomerate is now *two* companies. As a result, the “new” corporate intranet was abandoned. However, for both MC1 and MC2, the local intranets are just as important as ever to local processing, and the divisional intranet of MC1 has become an important vehicle for globally communicating across the divested unit locations. Interestingly, people within the firm had “suspected” that something like the split would happen. But, because the CEO’s mantra was “We are one company!”, during intranet integration planning, they couldn’t openly consider this scenario: “What if we split up? Let’s make sure we can deconstruct this thing easily.”

## **5.2 Health Care IT (HCIT)**

The second vignette is a story about an internal intranet integration that, unfortunately, succeeded. Health Care IT (HCIT -- a pseudonym) is the information technology development and management arm of a large US health care provider. The firm owns and operates hospitals, clinics and physicians groups in several regions throughout the country, but most are concentrated in Region 1, where the firm began. There are currently more than 100 intranets in Health Care. At one time there were more than 200, but the Region 1 Health Care IT group has been consolidating them and rehosting them on server farms whenever possible. This “house-cleaning” effort also extended to HCIT itself. In 1998, HCIT began a campaign to create one all-inclusive intranet for its own use. The main objective was to replace all of the Regional IT intranets with ONE that would serve the needs of all regions, and eliminate duplication of information (and the errors that go with out-of-date pages) and local maintenance. This coincided with a desire to standardize IT platforms and procedures throughout the firm. Region 1 would host the ONE intranet, but it promised to faithfully duplicate all of the functionality of the regional intranets that would be decommissioned. Region 4 IT personnel were skeptical about this arrangement, but they provided input to the ONE intranet design team, and when the day came, they dismantled their local IT intranet server and shipped it to Region 1. Two years later, Region 4 was still waiting for the promised functionality from the ONE intranet development team, and people who had grown used to the local intranet did not use the ONE intranet much. The ONE intranet was not as easy to navigate as their local intranet had been, and important directives that were posted there unfortunately went unheeded. During a site visit in late summer 2000, I found the Region 4 IT group scrambling to take Java classes so they could implement a new local IT project. Somehow, they had missed the April announcement of a new Java development standard, and did not realize until it was almost too late that their planned Visual Basic applications would have to be revamped. (The Java standard was “discovered” by a new Region 4 employee who was surfing the ONE intranet, looking for clues about how he should execute a new project assignment.)

Despite appearances, there was no malicious intent on the part of the Region 1 IT group. They were not trying to make things difficult for Region 4, they wanted to serve them well. Region 1 IT personnel really thought (and still think) that what they did was for the best—anything they eliminated was not needed, and all the needed functionality could be found “somewhere” in the ONE intranet—Region 4 people just needed to use it. Nevertheless, Region 4 feels under-served, and lately a new grass roots IT intranet has begun to grow there, out of the way of Region 1 oversight.

### **5.3 International Law Firm (ILF)**

The third vignette is about an external integration between a law firm and one of its most important clients. This integration was successful, but short term. International Law Firm (ILF—a pseudonym) is a large old prestigious US-based law firm with an active Washington DC branch. ILF has served as the “corporate law firm” for a leading midwest media broadcasting company (MEDIA -- another pseudonym) for a number of years. MEDIA has many intranet sites that serve its information and ICT-savvy personnel. In late 1998, one such site was rapidly taking shape as a repository for “everything we know about HDTV” (high definition television) and as a forum for strategizing. MEDIA was getting ready to launch its first HDTV station, and was hoping to influence pending legislation about this type of broadcasting that was moving quickly in Washington. The firm wanted its outside counsel at ILF to review the intranet documents and study data so that he could properly support his arguments at the legislative level in Washington on a bill that was going to define and perhaps limit HDTV broadcasting in the US. MEDIA had a station that was “ready to go” with HDTV, and it wanted to make sure that the legislation didn’t impose any early limitations that would make experimentation with that pilot project more difficult, or limit the revenue streams that they foresaw as coming from securing HDTV broadcasting rights, frequencies, etc. So MEDIA physically wired their Washington DC branch office (which just happened to be located in a building that ILF owned and occupied) to ILF’s network so that ILF attorneys could gain immediate access to the dynamic and quickly evolving HDTV intranet site hosted at MEDIA’s corporate headquarters. ILF counsel used the hard-wired connection to look at the intranet documents that the MEDIA was generating and collecting (some highly proprietary.)

Apparently, this integration worked as intended, and MEDIA got what it wanted legislatively. A year later, when I visited MEDIA headquarters, activity on that intranet site had dropped dramatically, ILF counsel had turned its attention to other matters, and the station had begun HDTV broadcasting. When asked, MEDIA personnel said they had no qualms about giving ILF attorneys long-term access to their entire network, even though the need centered around a short term single intranet site project. This remark conveys the easy trust they feel: “Well yeah, [ILF

is] our corporate law firm.” It is also interesting to note that several ILF attorneys, including the team involved with HDTV legislation, were listed in MEDIA’s online employee directory with no other distinction than “ILF” under the department name heading. One might easily mistake them for MEDIA employees.

Conventional wisdom would suggest using an extranet for the HDTV exchanges between MEDIA and ILF. At the time, ILF didn’t have an extranet. Now it does, but interestingly, its extranet is used more for internal projects and outreach, like preparing and disseminating materials for educational seminars that some of the attorneys hold, rather than for the secure transfer of case materials.

#### **5.4 Technology Research Group (TRG)**

The final story is about an external integration between an IT research and development group and one of its government sponsors. This integration is tentative and evolving. Technology Research Group (TRG--a pseudonym) provides research and development services to several agencies of the US government. Throughout its long history of working on government contracts, and meeting the documentation and reporting demands from sponsors to meticulously record how funds have been spent, what outcomes were achieved, and who worked on which projects, TRG has amassed a detailed digital record of project activities. That record has recently been enhanced through intranet database applications to allow TRG managers to quickly identify individual subject area experts and domains of expertise, as well as expert communities--both within their organization, and in the government agencies they have worked with--that can be tapped for upcoming projects. This intranet-based project history is something that one of its sponsors would like to access, in part because this is a record of the agency’s *own history* that it does not maintain elsewhere in searchable form.

The desired integration is a VPN-like (virtual private network) arrangement that would allow trusted members of the government agency to have permanent but selective access to TRG’s intranet. This would enable the agency to analyze its own projects with TRG and to evaluate related-TRG expertise by using TRG’s sophisticated analysis software and historical databases. Due to security concerns, that have only increased in recent months, the VPN has not become operational. Instead, a scoped-down, partial integration has been implemented that involves copying a portion of TRG’s intranet on a regular basis to a limited access server outside TRG’s main firewall.

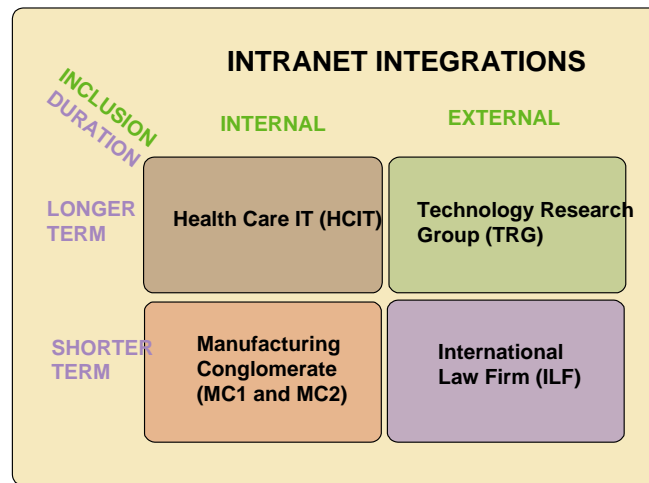
## 6. Discussion

Although many discussions about e-business systems integrations begin with a classification based on interorganizational relationship cardinality (i.e. 1:1; 1:N; M:N), the vignettes presented above suggest that for non-transactional integrations, two basic characteristics to more carefully consider are *duration* (i.e. the amount of time from the present that the integration is realistically expected last) and *inclusion* (i.e. whether the integration is internal to the organization, and how it might include interorganizational partners or clients.) These characteristics loosely dimension what is commonly meant by the term "project."<sup>4</sup> And they distinguish the main differences between the integrations described in each of the four vignettes. (See Figure 2.) Most projects are limited in cardinal terms, and most of the intranet integration examples I have encountered are either 1:1 with external organizations (e.g. ILF, TRG vignettes) or 1:N internally (e.g. HCIT vignette.) For many non-transactional integrations, it would seem that a project-based approach could be appropriate.

Ideally, a project-based SI approach would provide a framework for deciding when, where and how deeply to integrate non-transactional systems. We can see clearly from the experiences of MC and HCIT, that full integration is not always a good thing to achieve -- regardless of what upper management thinks. In firms that are changing through merger, acquisition and divestiture, "integration" plans should incorporate the notion that integration must be reversible or deconstructable at critical junctures to support a common range of expected present and future interorganizational interactions.

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<sup>4</sup> From Webster's online dictionary: **project**. Pronunciation: 'pră-"jekt, -jikt also 'prɔ-. Function: *noun*. Etymology: Middle English *proiecte*, from Medieval Latin *projectum*, from Latin, neuter of *projectus*, past participle of *proicere* to throw forward, from *pro-* + *jacere* to throw. Date: 15th century. **1** : a specific plan or design. **2** : a planned undertaking; as **a** : a definitely formulated piece of research **b** : a large usually government-supported undertaking **c** : a task or problem engaged in usually by a group. (<http://www.m-w.com/cgi-bin/dictionary/project> )



**Figure 2:** Two Basic Dimensions of Intranet Integrations: Inclusion and Duration

A social actor model of analysis can help to foster a project-based approach. Internet technologies *are* a flexible architectural basis – and in most firms intranets have been implemented modularly, through diverse grass-roots efforts. As the intranets “mature”, however, they tend to become *structurally* integrated within the organization in ways that make subsequent *project*-based integrations within communities of practice difficult. At TRG, one of the main obstacles to achieving project-based integration with its external partners is that intranet integration within the firm has been too well-achieved. As a result, it is hard for TRG to securely expose only a small segment of its intranet to a trusted government agency.

When planning systems integrations, then, it is important to carefully consider the interactions to be supported, because the main characteristics of the integrations examined here (duration and inclusion) are derived largely from those interactions. (See Table 2.) From the SI literature cited earlier, we can characterize Transaction-based interactions as usually multiple, small and of *short duration*. They often involve the exchange of goods and services, and have come to *include* ICT systems as a fundamental part of *external* customer and vendor relations. From the vignettes discussed in this paper, we can see that Project-based interactions are also multiple, but somewhat larger, often *longer term* (but not always.) They usually involve goal seeking or problem solving exchanges of data and know-how, using ICTs like email and FTP sites to coordinate the work of *internal* organizational work groups *and* their *external* collaborators. From the organizational literature (cf. Scott, 1987), we can view Structural interactions, in contrast, as regular and *semi-permanent*. They often involve the adoption of policies and the construction of organizational hierarchies that *depend on* automated processing and enterprise-wide systems to manage intrafirm relations.

**Table 2: A Social Actor View of Integration Interactions: Transaction, Project, Structure**

SOCIAL ACTOR CHARACTERISTICS	INTERACTIONS	TRANSACTION	PROJECT	STRUCTURE
Organizational individuals seek to communicate in intimate ways		Quick, efficient, multiple communications	Time-limited, complex, multi-party communications	Regular, detailed, proprietary reporting communications
Organizational individuals build, design, and develop interactions that facilitate “flow” changes		Buy-sell exchanges of goods and services	Goal-seeking or problem solving exchanges of data and know-how	Hierarchies and policies that govern internal processes
ICTs become part of the interaction process, (“interaction technologies”) and people transform and embed available informational resources into connections and interactions		POS systems, accounting DBs, B2C websites	Email, FTP sites, CAD/CAM systems, grass-roots intranets	Automated processing, document management systems, corporate intranets
As firm members, people perform socially embedded role-based, highly specified actions on behalf of the firm		Customer and vendor relations	Research and development partnering relations	Executive, managerial and staff relations

This expansion of the Interaction dimension of our social actor model describes how three types of interactions may shape social actors’ ICT use in very different ways. When examining the potential and desirability for non-transactional SI, this typification could provide insights about potential approaches for a planned integration by linking the differences we see among the three kinds of interactions to basic social actor characteristics (cf. Table 2) to help frame more realistic implementation strategies. For example, when considering if it makes sense to integrate a corporate HR intranet and a grass-roots R&D site, the social actor model suggests that it would be prudent to think carefully about legitimacy, planned (or unplanned) “flow” changes, embeddedness, and organizational roles. Such considerations may not be easy. CEO's, like MC's, may not want to admit that a major organizational restructuring is on the horizon, and firms that have just made huge investments in ERP systems don't want to talk about breaking them down. But a social actor view would caution that an intranet that adequately supports *structural* interactions is likely to become *structurally* integrated over time, in the sense that after integration, it would rarely be possible to extract out "the intranet" that was originally integrated in.

An understanding of the environments and affiliations of the communities of practice affected by a proposed integration, and a closer examination of the characteristics of associated interactions could, I believe, provide a better basis for



making decisions about SI.<sup>5</sup> For IT groups, such as HCIT, this will involve a major change of perspective -- currently, when IT staff examine grass-roots intranets, they are more likely to view them as “a problem” rather than as an opportunity for flexible project-based integration.

## 7. Conclusion

The conversations that spurred this integration-focused analysis of my intranet study data occurred at an EC-US workshop in Venice last October, where the talk turned to notions about firm rigidity and the demands for organizational flexibility in a digital economy. EU firms are traditionally thought to be more rigid than US firms, largely due to institutional considerations. But, as the vignettes presented above show, the flexibility of a firm's IT configuration certainly contributes to the possibility of sharing information within communities of practice that cross organizational boundaries, and that being selectively "open", depending upon the interorganizational relationship, does require some configurational suppleness.

Clearly, we need to develop new indicators of firm rigidity and flexibility that further dimension systems integrations and that differentiate between types of integration interactions. (What does it mean to be more rigid? What does it mean to have more opportunities to change partners?) We also need to develop new case study methods for understanding rigidity, flexibility and inter-firm integration.

In this paper, I have examined the ways in which US firms seek to integrate (and need to share) their intranets with clients, partners, mergers, spin-offs and other organizational units. In terms of intranet integrations, these firms are perhaps less flexible than supposed. I have speculated that a project-based approach to SI can yield greater flexibility over time, and have begun to characterize non-transactional SI in a way that could provide better indicators of rigidity and flexibility. I believe, these are promising steps toward formulating a concept of negotiated project-based integration based on strategic interorganizational relationships.

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<sup>5</sup> A more detailed analysis of the social actor characteristics for Affiliations, Environments and Identities (see Table 1) has not been attempted in this paper, but is part of my ongoing intranet research and analysis.

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