

Integrating Territories: Information Systems Integration & Territorial Rationality

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ABSTRACT

This study explains the mismatch between the planned domain of integrated information systems and the existing territorial rationalities. We define a territorial rationality as a collective perspective which serves as a philosophical basis or a conceptual lens for decision-making. We define a territorial entity as members of an organization (or organizations) who hold this territorial rationality. When these territorial entities interact among each other, their territorial rationalities are transformed by three major modes: authority, exchange, and persuasion. These new concepts can be used to predict how multiple subunits in organizations strategically respond to the integration of disparate information systems. Possible themes for the responses range from local autonomy versus central control, to knowledge diffusion versus knowledge specialization, to resource redistribution versus resource alignment. We argue that the changes in territorial rationalities and entities explain the divergent organizational responses to the integration of information systems.

INTRODUCTION

Experiencing new technology often creates a need for revisiting old concepts or defining new concepts for explaining new phenomena (Kuhn, 1970; Kuhn, 1977). New technology typifies new organizational responses, and thus reestablishes and revises the interactions between the technology and an organization. Moreover, organizations typically demand and push for modified or new technology, and thus revise the interactions (Markus & Robey, 1988; Lee, Madnick, & Wang, 1991). The most conventional and research focused on the interactions between technologies and industrialized organizations can be traced back to the socio-technical systems research (Emery, & Trist, 1965; Miller,

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1952; Trist, & Bamforth, 1951). Miller (Miller, 1952) defined the concept, territory, to identify logical and rational grouping

of technological devices such as machine tools with organizational working processes within a firm. Territory, in his term, is a rational boundary that coincides with kinds of technology with manufacturing procedures¹.

When conventional database management systems (DBMS) have been introduced into organizations, their design has followed the premise that the rational boundaries for logical and efficient interactions between technology and organizational processes were congruent. For example, an accounting department would have its own DBMS that coincides with its organizational processes, and an R&D department would have its own DBMS, unless the entire organization shares a homogeneous DBMS. Naturally, these DBMSs were historically developed within justifiable budget constraints and were, thus, heterogeneous: that is, they often used different architectures, hardware platforms, languages, and application systems.

Due to globalization and business process redesign, the boundaries of the conventional territories have been extended and expanded. On the technological side, the advanced interface technologies available and emerging for database technologies enable linking the business processes among geographically dispersed and functionally diverse units or parts of a single organization or parts of multiple organizations. The technologies range from standardized application systems for homogeneous DBMSs, to heterogeneous DBMSs that could achieve logical as well as physical connectivity (Wang, & Madnick, 1988). Therefore, integrated information systems can link otherwise separate and autonomous organizations or sub-units of organizations. One might argue that DBMSs ought to be designed to connect all the possible organizations

¹ In cotton mills, for example, dyeing and bleaching are chemical processes that would draw a territory. Sizing, warping and weaving would belong to another territory that do not have to be closely connected to those of chemical processes. These two territories are loosely connected for processes in cotton mills.

in order to fully exploit this technological advance -- at the extreme, "one big system" or a homogeneous DBMS for inter- and intra-organizational computing, since information technology can overcome the locational and spatial constraints that conventional manufacturing technology had in the past.

The paradox is that locational constraints remain persistent in the integration of DBMSs, despite the existence of technically feasible alternatives². Organizational structures and processes direct and change technology, as changes in technology impact redesigning organizational structures and processes. In this change process latent groups who share a common perspective, interests, and constraints might be mobilized and become visible to shape divergent responses to systems integration. This is our starting point for extending the concept, "territory," and for developing explanatory concepts -- territorial rationality, territorial entity, and transformation modes -- that could be used to predict organizational responses to integration of information systems.

This research is significant in five ways. First, it explains the sources for a misfit between planned domain of integrated information systems and organizational processes. Second, it provides the concept of territorial entity as a unit of analysis that can incorporate theories-in-use³-- theories of action constructed from an organization's actual behavior -- of organizational processes beyond the formal organizational structure and boundaries. Third, the framework can be utilized as a mechanism for identifying different loci of organizational autonomy and integration. Fourth, with this loci identified, decisions can be made as to how and to what extent integrated information systems can be employed as a tool for different kinds of organizational change. Fifth, this paper is particularly timely because of the increasing globalization trend, where information technology needs to be carefully

incorporated with territorial rationalities -- collective perspectives for decision-making -- in global and local organizational units in order for both the systems and the organizations to function most efficiently and effectively.

MAPPING IS WITH ORGANIZATIONS

The ramifications of mapping technical systems boundaries with organizational boundaries are complex in both organizational and in technical arenas. Particularly, the thorny issue of the delicate link between the macro (the entire organization's) objectives and rationalities and micro or local (sub-units') objectives and rationalities are becoming increasingly difficult to understand and resolve. Designing DBMSs different in kind and scope entails considering not just vertically-driven organizational differentiation but also laterally-driven organizational differentiation among multiple functional areas. Thus, the design issues include both control and competition in organizations. Therefore, designing an integrated DBMS entails several critical questions. What do we mean by a territory? Whose rationality is represented and how was it formulated and changed over time?

These questions address the problem of how conventional boundaries of territory, which have constraints in location, needs to be modified and extended. We argue that technical infrastructure is also a mirror that reflects organizational structure and processes. As structuration theorists suggest, (Bacharach, & Aiken, 1976; Giddens, 1984; Ranson, Hinings, & Greenwood, 1980), technical infrastructure is continually produced and recreated from interactions, and yet shapes those interactions: structures are constituted and constitutive. This view opens a way of connecting technology and organizational processes as mutually embodying common categories, a way of seeing technical infrastructure as a vehicle constructed to reflect, and yet to facilitate organizational processes.

To understand this type of interaction, we extended the concept of territory to include a specific characteristic of information technology, particularly DBMS technology. We define the concept, territorial rationality, as an acceptable and dominant collective perspective for decision-making in technical choices within a territorial entity. A territorial entity is defined as a group of individuals who holds a common territorial rationality. This entity often resembles loosely-connected archipelagoes in organizations. Territorial entities are shaped and reshaped as a decision on integration technology moves through different stages -- such as conception, planning and design, and implementation stages -- over time (see Figure 1). Records of decisions publicly available such as memos, guidelines, espoused policies, functional requirements, and product specifications are the products of the above decision-making processes. In order to make these decisions, an organization ordinarily goes through processes of resolving and transforming multiple contending territorial rationalities and territorial entities. Therefore, a choice of the technical contents of the DBMS should be understood as the outcome of the complex interactions of

² Consider the following case stories.

Case 1 An international bank attempted to install integrated information systems for letters of credit, accounts procedures, and MIS reports across geographical boundaries. It ended up developing and redeveloping some fifty different information systems. The systems were installed and operated within the conventional geographical boundaries.

Case 2 A university was developing its integrated information systems across its functional organizational boundaries. The project team was developing the "general requirements." Despite the contending requirements, the project team's decision on the design of the integrated information systems was relatively easy. A coalition was built among the core student service departments under a vice president.

Case 3 A chemical company launched a data dictionary project across its R&D laboratories which specializing plastic products. The problem encountered was beyond the semantic reconciliation of terminologies that the multiple laboratories used. The laboratories could neither agree on using same terminologies nor was willing to make a list of synonyms translated for other laboratories.

³ See Argyris and Schön, 1978.

Figure 1: Decision-making Processes

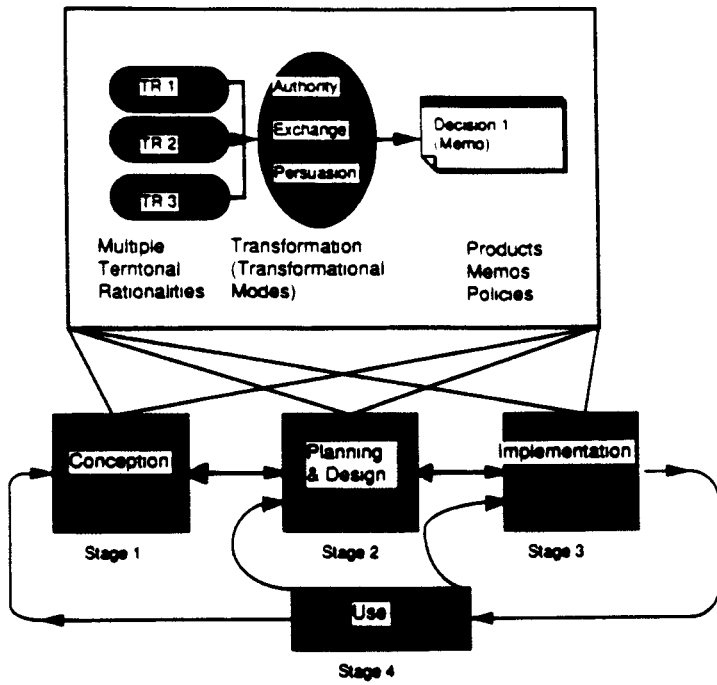


Figure 1.1: A general model

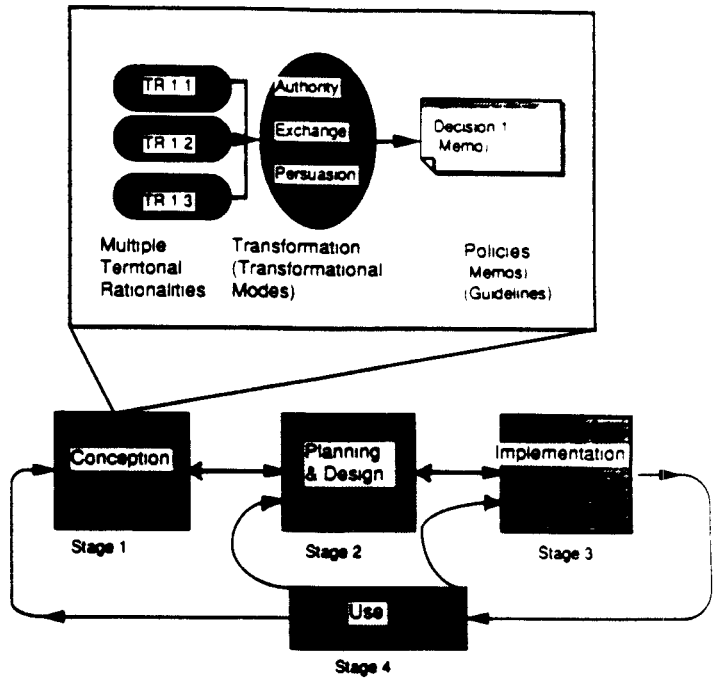


Figure 1.2: Stage 1

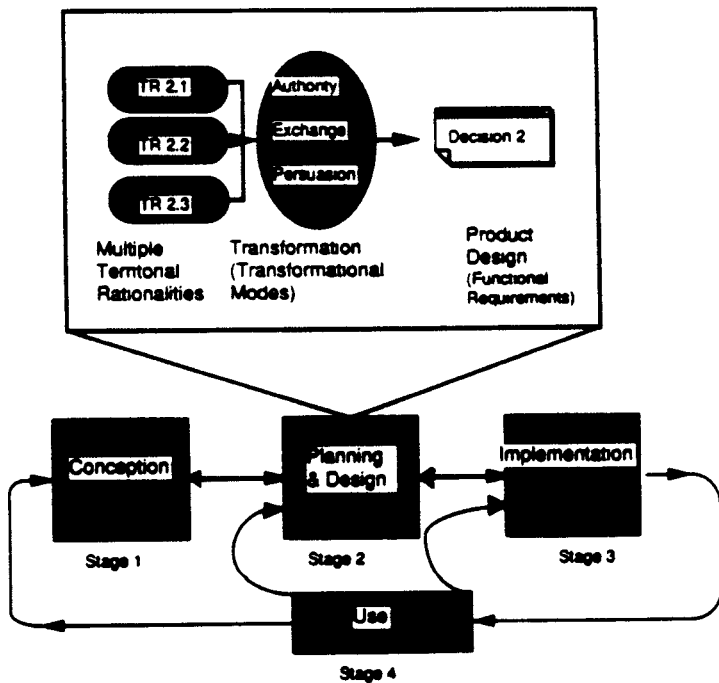


Figure 1.3: Stage 2

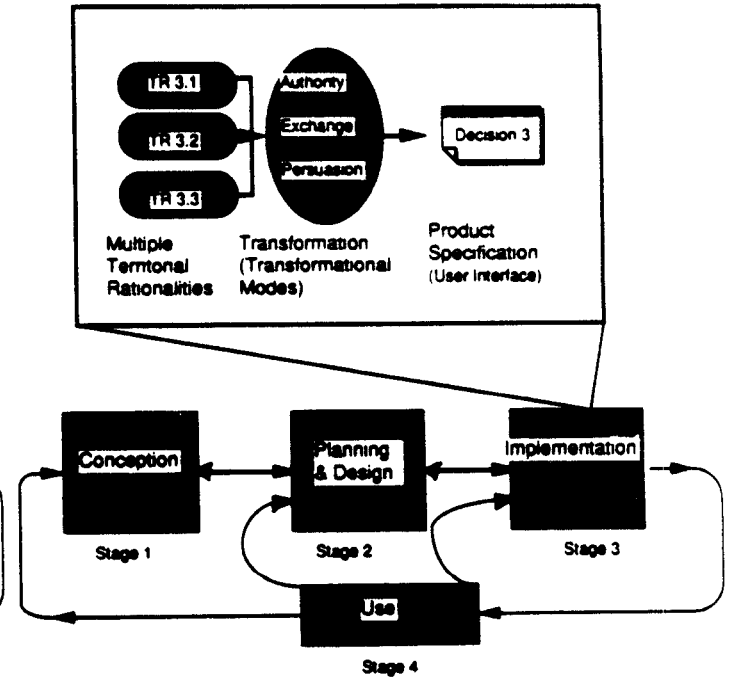


Figure 1.4: Stage 3

interpersonal cognitive processes, power dependencies, and contextual and institutional constraints.

In mapping integrated information systems with organizations, we need to understand both technical design of DBMS as well as organizational workings of organizations. To design (or purchase) a DBMS, we need to know what functions and scopes are needed for a certain organization. Depending on the scope of the DBMS, the boundary could be intra-organizational, inter-organizational, or a combination of both. In deciding upon a specific design, we need to understand the form and context of the working knowledge or knowledge-in-practice (Innes, 1989) of an organization. To understand how organizations work, we need to understand not an organization as a whole but an organization as an integrated entity of the parts of multiple levels and sectors.

First, we will critically review and synthesize the organizational theories relevant to our research-- specifically, organizations as members of agents and organizations as members of actors -- to converge instrumental rationality and political rationality. The integration of these two perspectives with institutional context theories will be presented to develop a new concept, an organization defined as members of territorial entity . Second, we will further show how the collective territorial rationality is formulated and could be transformed through organizational interactions where authority, exchange, and persuasion take place. Last, we will show how the above concepts can be used to predict strategic responses of local and central levels of organizations to systems integration. These responses include the following: (1) Hegemony over integrated information technology within organizations; (2) coalition-building for or against development of integrated information systems; and (3) contest for contents of integrated information systems, such as technical choices in terms of functional and procedural specificity. We will also discuss different patterns of groupings of territorial entities that might produce these responses

ORGANIZATIONAL DECISION-MAKING

Many organizational theorists have characterized how members of organizations behave and make decisions. We will examine two mainstream theories-- organizational members as agents and as actors -- because they explain both human limitations and capacity for making collective decisions that are represented in integrating information systems such as disparate database systems. By "agents," we mean the members of an organization faithfully translating organizational goals into decisions and thus into actions, although their ability is limited by the virtue of their physiological and psychological limitations (Cyert, & March, 1964; March, & Simon, 1963; Simon, 1958). By "actors," we mean the stakeholders and members of an organization willing to play games as they contest to gain power over information and opportunities and to garner resources for their interests (Benson, 1975; Benson, 1977; Crozier, 1964; Linblom, 1968; Pettigrew, 1973; Thomas, 1988).

Beginning with Linblom (1968), many researchers have effectively demolished the idea that collective decision-making can be accurately described as a comprehensive rational analytical exercise (Allison, 1971; Mintzberg, 1989). We argue that rational decision-making, often summed up as instrumental rationality, has a renewed role to play in decision-making in combination with political and instrumental perspectives. First, instrumental rationality is embedded in collectively acceptable group thinking processes. Second, this rationality is often used as a basis for refuting for competing alternatives. As much as the instrumental rationality can be ignored as an instrumental framework for a naive analysis by groups with other interests, it can also be utilized as a theoretical base to combine with their platform for interest-seeking groups. This is the lever that we visit both perspectives -- agents and actors perspectives -- for developing more elaborate concepts for decision-making in information systems area.

AGENTS AS DECISION-MAKERS

The agent perspective (Cyert, et al., 1964; Lawrence, & Lorsch, 1967; Simon, 1958; Stinchcome, 1974; Thomson, 1967) emphasizes the limited capacity of a human. This is summed up by Simon's concept of "bounded rationality." It is viewed that human behaviors are intendedly rational but limitedly so. The remedy for human bounded rationality is instrumental and knowledgeable rationality. According to the agent perspective, the very remedy to overcome human incapability and subjectivity is knowledge. However, knowledge is historically and socially constructed (Dunn, 1989; Innes, 1989; Luckmann, 1975) so that it may not completely serve the purpose of objectivity that agent theorists strive to achieve. Organizations as agents are involved in the effort to achieve objectives by the judicious selection of appropriate means. The focus is upon the acquisition and application of knowledge useful for effective performance of organizational tasks, and the organizational world is conceived as fundamentally comprehensible through scientific methods.

How can this perspective be applied to explain integrated information systems? Integrating information systems includes a design process for decision-making and operations that organizations need. For example, Gorry and Scot Morton's (1971 & 1989) often-cited MIS framework for decision support systems would be a way to achieve this decision-making through decision support systems, because it increases rational knowledge needed for efficiency and productivity for entire organization. They identify basically three levels of decision-making: strategic, managerial, and operational. These levels of knowledge support for different levels of decision-making are assumed to achieve common organizational goals. The missing element in this framework is the links among the different levels: not merely operational coordination, but more importantly, making sense out of sub-divided perspectives from these divided and composite

decisions made at different times. The relationships among the decisions at different levels may not simply be a systematic aggregation of sub-decisions.

ACTORS AS DECISION-MAKERS

The organizational members as actors perspective has two major elements. First, power is defined as an important factor for an actor in influencing the behavior of another actor (Crozier, 1964; Katz, & Kahn, 1966). Second, politics involves the source of power and other resources to obtain one's preferred outcome when there is uncertainty or disagreement about choices (Pfeffer, 1980). In other words, political activities are the salient elements to be investigated for understanding organizational processes which are based on competition and control. Specifically, higher levels of uncertainty and disagreement tend to be associated with higher levels of political behavior. Organization theories that have a bearing on process technologies have pointed to the political environment of an organization and to "institutional entrepreneurs" (Dimaggio, & Powell, 1983).

The organization as actors perspective would explain a change in an organization as involving as modifying rule systems, a process often described as a "game" involving multiple actors with diverse interests (Benson, 1977; Markus, & Robey, 1988; Pettigrew, 1973; Pfeffer, 1980; Thomas, 1988). From this perspective, understanding territorial rationality for particular information systems involves analyzing a system of political games occurring at multiple levels and in multiple parts of an organization. The game defines the content of changes in the integration of information systems. The political perspective takes human actors as the focus of the analysis, as actors contest among each other for gaining preferable decisions through a search for interests and opportunities.

Some actors of an organization more powerful than others can dictate through quiet or direct "orders" to introduce a new information technology that can integrate information systems and diffuse it organization-wide. There may be politically stronger groups than others to favor a certain information technology (Benson, 1975). A top-management team may act in concert with other organizations to integrate information technology in multiple organizations. Opposing arguments will be weeded out and consolidated by win-lose games and eventually the dominating group's idea on information technology will be adopted.

THE JANUS: AGENTS AND ACTORS AS DECISION-MAKERS

Agents perspective explains organizational phenomena well when we assume that organizational goals are consistent among each other and they are clearly established. Actors perspective explains organizational phenomena well when we assume that organizational goals are multiple and contradictory among each other. Nevertheless, these perspectives have not

fully integrated technological and institutional limitations and capacities which may set the boundaries of human choice.

Organizational members choose a certain kind and scope of integrated information systems to achieve some of the organizational goals that are within institutional context and technological capacity and feasibility. These kinds of actions might be explained as a politically calculated way of yielding to espoused goals. For example, often experienced contests for the kinds and the scope of the integrated systems among different groups might have been argued based on the members' rationalities on technical capacity and feasibility. In other words, political contemplation would certainly include apolitical rationalities in order to maximize actor's gain over integrated information systems.

Both Simon (Simon, 1958) and Linblom (Linblom, 1968) agree that organizational members do not achieve objectives as they planned to. However, in their explanation of this gap between the results and the intentions, there is a critical difference. Simon posits that organizational members "satisfy" their objectives because they have limitations in terms of memory and processes. Linblom argues that members mutually adjust because members recognize that no clear common reason can defend their position to win over the opponents. It can also be an attempt to be accepted by others and more importantly trying to find what is feasible. Agents perspective explains systems integration as a supplement to human capacity. Actors perspective explains systems integration as a mirror reflecting the political game -- politically fought out dominance for one group against others for control in organizations.

The converging point of the two perspectives is that members of an organization orchestrate themselves in a way that their rationalities for technical choice can yield to organizational approval based on their local rationality. Hence, workable integrated systems must have a common denominator among the participants. This is the lever that two perspectives need to be carefully converged (see Table 1). We view that agent perspective misses the political explanation and that actors perspective goes too far, portraying top management particularly deterministically all-mighty calculating free actors by neglecting structural limitations at the institutional and societal levels and technological capacity. Territorial entities may not simply trying to protect their own interests. They may see local constraints that other entities fail to see. Territorial rationality of a territorial entity resembles the two-faced Janus being an "actor" which plays its socio-political game as well as an "agent" which represents its techno-economic constraints and capacities.

Territorial Rationality

As we mentioned before, human rationality is bounded (Simon, 1958). Simon described and distinguished different kinds of rationality depending upon the objectives to be served, the values to be fulfilled, and the criteria to be compared. He states

that a decision is "objectively rational" if it is the correct behavior for maximizing given values in a given situation; "subjectively rational" if it maximizes attainment in relation to the degree that the adjustment of the means to the ends is a conscious process; "personally rational" if it is oriented to the individual's goals; and "organizationally rational" if it is oriented to the organization's goals (Simon, 1958).

In our context, we define a decision territorially rational if it is based on as local knowledge-in-practice (Dunn, 1989; Innes, 1989), that is, if it is based on members' norms, knowledge, institutional setting, and technological contexts. We do not view territorial rationality as a consistent value judgment template for groups based merely on organizational boundaries and structure or professional roles. A group of individuals that share certain rational ways of doing things might be publicly obvious or private, depending on organizational and territorial cultures and individual responses to these cultures. As noted earlier, territorial rationality⁴ is defined as an acceptable and dominant collective perspective for decision-making in technical choices within a territorial entity. It is a collective perspective that shapes a capacity for decision-making on issues in question. It shapes the philosophical basis for viewing events and questions at stake. Thus, territorial rationality is a combination of socio-political and technoeconomic rationality. This territorial rationality perceives and responds selectively to the constraints and opportunities in the context of technology (Wang & Madnick, 1988), environment (Lawrence and Lorsch, 1967), resource interdependency (Pfeffer, 1980; Van de Van, 1976), and institutions (Dimaggio, et al., 1983; Lee, 1988; Thomson, 1967). Territorial rationality can be utilized in leading its territorial entity to make a coalition with other entities for certain issues in "reframing" (Rein, 1986) and problem-setting in designing and implementing integrated information systems.

Viewing organizational goals as neither singular nor static, there are two critical leaps in our perspective from "bounded rationality" (Simon, 1958). One is from the individual to the organizational level of rationality. Another leap is in the focus on changes in what is considered rational over time. In the context of the first leap, how individual rationality shapes the collective rationality to organizational rationality gives important clues to different contexts, goals, and interests among different functional departments, divisions, and the combination of individuals from different levels and functional departments. In the context of the second leap, the changes in territorial rationality over time are critical because the salient

4 One can easily relate the concept of territorial rationality to Simon's (1958) "bounded rationality." Simon's concept emphasizes computational, perceptual limitations of an individual. We focus more on contextual setting, such as organizational structures and processes that facilitate individuals to have more knowledge on and interests in their own surroundings than knowledge of others' constraints and settings. By "territorial rationality" we are referring to these constraints and interests. We call this knowledge that serves as the entity's philosophical base for decision-making and coalition-building, "territorial rationality."

issues over time change depending on the different contexts of each stage of decision-making. For example, the different stages in deploying integrated information systems are the conception, planning and design, and implementation stages. In this example, technical choices related to a DBMS have to be elaborated and argued as rational courses of action based on the relevant context of a stage. Questions of control, budget allocation, redistribution of resource, and policies of rewards/sanctions are likely to be discussed at the conception stage of the DBMS. Functional requirements of each department are likely to be discussed at the planning and design stage. A decision concerning the requirements includes the mapping of "entities" -- such as departments -- with their relationships with other "entities" (Chen, 1976). User-friendly design may be an important issue only in the design or implementation stage. Naturally, these issues may run across all the stages.

The crucial feature of most organizational decision making is that revisiting the decisions made in prior stages tends to be rare. For instance, the possibility that user-friendliness exceeds the original budget allocation may not necessarily be pushed hard enough by decision-makers to revisit the previous stage's decisions on the budget. The previous decision becomes the frame of reference for the following stage's decisions, yet the linkage between the two stages to the subgoals may not be analyzed and reflected upon by organizational members because it was not considered a relevant focus in either stage. Exceptions⁵ may occur in those cases where strong opposition by a coalition of certain groups who are active in the first stage follow through into the next stage's projects in order to influence decisions and choices retrospectively. Nevertheless, this type of influencing game has to be played based on the next stage's scope of goals and objectives. Therefore, different aspects of issues and problems dominate to become the bases for decision-making at each stage of decisions⁶. As decisions are made over time, goals are shaped in a composite manner based on territorial rationalities as they go through problem-solving stages across parts of an organization⁷. Therefore, territorial rationality is local in nature and changes over time depending on the issues in question. The integration of information systems,

5 Another exception is a learning organization, where feedback is reflected on and, thus, the organization is capable of learning to learn.

6 This notion is well discussed and elaborated as learning site and locus of learning in Lee, 1988.

7 We differ from most of the implementation studies comparing what are intended and unintended consequences of organizational actions and decisions. Usually this evaluative discussion is conducted with the assumption that the comparison of the intention and the results ought to be conducted based on the initial espoused top-level managers decision as it compares with the implemented results. The incongruity between the two is known as unintended consequences. Our view is that the initial intention moves along decision-making stages and is transformed, operationalized, and finalized.

particularly DBMSs, includes integrating territorial rationalities across parts of organizational boundaries, since territorial rationality is the crucial engine for formulating organizational decisions.

Territorial Entity

The distinction between individual and organizational levels is well understood in practice and research. In between these two distinct levels, there are sub-units within an organization (or organizations, in the case of a super-organization, such as a joint venture) which behave as if they have a homogeneous or collective voice at times by individuals acting as agents and actors of an organization. The most simplified examples are different levels within an organization -- strategic, managerial and operational levels -- and functional units, such as marketing, R&D, and engineering. For example, Olson (Olson, 1971) classified three kinds of groups in the context of participating in collective actions for public and common goods: privileged groups, intermediate groups, and latent groups. The taxonomy of groups for territorial entity includes difficulty in terms of boundaries of a group and characteristics of group members, for there are factors which do not necessarily correspond to the rank-and-file division of labor and formal organizational structure. We have not been satisfied with the formal differentiation within an organization, because, in practice, the territorial entity's boundary is fuzzy and does not necessarily correspond to organizational departments and functional units. For example, it is well articulated by classical organizational theorists (Lawrence and Lorsch, 1967) that the sales department is primarily responsible for sales goals and sales strategy; the production department is primarily responsible for production goals and production procedures; the pricing department is primarily responsible for profit goals and price decisions; and so on. On the other hand, informal networks within organizations might have an influence on the boundaries of territorial entities. The informal network itself does not necessarily represent interests riding on formal agendas and institutional frameworks and constraints.

We define a territorial entity as an organizational sub-system. An organization may consist of several territorial entities. Territorial entities can be formed at a combination of different levels (hierarchical) and functions (lateral). These zigzag-shaped territorial entities are not totally free of influence by networks of socialization (Van Mannen, & Barley, 1984), which may blur the boundaries between rationalities, values, and customs at work and in social settings. These territorial entities are partly autonomous, yet are interrelated, with each one setting constraints on the kinds of changes that it can cause to occur in other territorial entities. This does not mean that each entity is mutually exclusive. An individual could be a member of multiple territorial entities. Such flexible boundaries explain why members of an organization designed to share organizational goals, resources, information, and liability do not necessarily share all of these. What is more, there might be multiple territorial entities within an

organization. A territorial entity may not necessarily correspond to traditional (or stream-lined) sections or divisions.

A territorial entity⁸ has the following characteristics: it is self-centered, it aims at protecting its own socioeconomic and political position, and it has a limited time span of interest. A territorial entity has an independent decision-making capability, an internal or informal reporting system, resource and information sharing, and a liability-sharing system. These characteristics lead a territorial entity to inherit and to develop its own territorial rationality, that is, its own perspective for viewing the problems and issues in question, which serves as a philosophical basis for the territorial entity to interact with other territorial entities. The boundary of a territorial entity shifts based on specific issues in question.

Our notion of how territorial entities are shaped is based on formal organizational structure, yet we also believe they are informally influenced and behave within the institutionalized framework of organizations. Members of territorial entities may come from different departments and levels and they actually participate in a series of pre-decision-making processes in a formal organization. These may include initiating and formulating internal memos and meetings. The territorial rationality of a territorial entity is articulated enough to be communicated to other entities within an organization and territorial rationality has a bearing on decisions. Yet, these are far from the final decisions that a formal organization itself would make. We strongly believe that the activities at a territorial entity level are crucial because (1) members' ideas are becoming clear about multiple sub-goals, interests, and constraints they face. (These ideas may take the form of opinions and memos that are internal yet publicly known within a certain boundary.) (2) These fuzzy and intermediate ideas at a territorial entity level are closely related to how sub-units' goals and global goals are contested and articulated in order to reach a final plan or a decision. This crucial stage in opinion-forming should be paid much closer attention to, if we

8 There are three key benefits in using the concept "territorial entity." First, the concept of territorial entity captures the reality of organizational workings beyond the organizational structure. This is primarily why we define and use a territorial entity as a unit of analysis, instead of conventionally-drawn boundaries such as a division or an organization, all of which fall into the conventional dichotomy of intra- or inter-organizational structure. Second, the concept can explain socio- and political-economic activities in and out of a territorial entity that are directly related to global and local contention. For example, one can easily think about the political economic aspects of territory-protection games; and sociological and anthropological aspects related to the internal and external behaviors and culture of a territorial entity. Finally, the concept of a territorial entity would help explain one of the most haunting and repeated concerns in business firms, such as the delicate balance between global and local levels or organizational as a whole and local territories. They are often phrased as the organizational "bottom-line" and members' notion of "what's in it for me?"

Table 1: Synthesis of organizational decision-making perspectives

Variables	Agents	Actors	Janus Territorial Rationality
Salient element	<ul style="list-style-type: none"> • Rational knowledge 	<ul style="list-style-type: none"> • Political Interests 	<ul style="list-style-type: none"> • Context (institutional and technological)
Criteria for choice of IT	<ul style="list-style-type: none"> •objective and neutral knowledge for decision-making • efficiency •productivity for entire organization 	<ul style="list-style-type: none"> •personal agenda and interest for political gain •appropriate choice •group or individual interests 	<ul style="list-style-type: none"> • local knowledge transformed to fit organizational context availability and capacity of IT and utilization function by organization
Goals	<ul style="list-style-type: none"> •assumes one clear common goal for entire organization 	<ul style="list-style-type: none"> •assume multiple and hidden goals an agendas 	<ul style="list-style-type: none"> •shifting and multiple goals constrained by institutional context and technological capacity
knowledge utilization	<ul style="list-style-type: none"> •knowledge diffusion by the center 	<ul style="list-style-type: none"> •knowledge manipulation at the center 	<ul style="list-style-type: none"> •knowledge contest at multiple loci
members' capacity	<ul style="list-style-type: none"> •emphasis on rationality 	<ul style="list-style-type: none"> •emphasis on political game 	<ul style="list-style-type: none"> •situational rationality and group dynamics • translating knowledge to action and acknowledging the gap
management bias	<ul style="list-style-type: none"> • top-level 	<ul style="list-style-type: none"> • shop-floor level 	<ul style="list-style-type: none"> •zigzag-shaped interaction including lateral and vertical levels
members' orientation	<ul style="list-style-type: none"> •task and role oriented 	<ul style="list-style-type: none"> •position and interest oriented 	<ul style="list-style-type: none"> •territorial rationality oriented (task + interest + institutional limitations)
locus of problems	<ul style="list-style-type: none"> •technologists vs. users 	<ul style="list-style-type: none"> •management and/or technologists vs. users 	<ul style="list-style-type: none"> •territorial entities depending on issues at stake and capacity of technology
prescription	<ul style="list-style-type: none"> •environmental scanning •user training 	<ul style="list-style-type: none"> •user participation 	<ul style="list-style-type: none"> •identify territorial rationalities •external and internal context examination
view on IT	<ul style="list-style-type: none"> •optimistic 	<ul style="list-style-type: none"> •pessimistic 	<ul style="list-style-type: none"> •realistic
IT integration	<ul style="list-style-type: none"> •coordination of tasks 	<ul style="list-style-type: none"> •control and resistance 	<ul style="list-style-type: none"> •transformation of territorial rationalities
Organizational Values	<ul style="list-style-type: none"> •neutral values 	<ul style="list-style-type: none"> •multiple values 	<ul style="list-style-type: none"> •value-critical within context

attempt to offer normative prescriptions for integrated information systems.

For example, tracking how idea A is formulated and how it migrated from territorial entity A to B and got approved by upper level, so on and so forth, could lead us to understand how issues of hegemony over integrated information systems play an important role in certain organizations.

If the database system is centralized and homogeneous, the likelihood of contention over hegemony over integrated systems will be higher than with heterogeneous database systems where multiple territorial entities are allowed to control their systems domains.

The Transformation of Territorial Rationality

It is important to recognize territorial rationalities because some of them can be transformed or bypassed in the process of decision-making. This evolution of territorial rationalities can be a clue for explaining passive resistance later on in the planning and design or implementation stage. Territorial rationalities alone would not necessarily be the sole basis for decisions made by the multiple territorial entities. Based on the territorial rationality members hold, the members make coalitions. Territorial entities orchestrate to make coalitions which transform the boundaries as well as their rationalities.

Knowing what each territorial entity believes ought to be the rational course of action alone does not explain the final action taken. We particularly depart from research conducted in information technology which suggests that there is an absolute antagonistic relationship between technologist and users. As suggested by Simon's earlier observation (Simon, 1958), role-based analysis -- technologists and users -- offers us a basic understanding of how human beings are expected to behave. However, this alone can mislead researchers to a dichotomized version of how decisions are made. Borrowing Simon's example, a captain's role is to sink with his ship when an accident occurs. The reality (not the movies) does not necessarily square with this role-based analysis.

Now we have concluded our initial discussion of territorial rationality, let us examine how the territorial rationality is transformed into the actual organizational decision taken (See Figure 1 for a schematic flow of transformation through decision-making stages). Linblom's concepts of coalition-building (Linblom, 1965; Linblom, 1977) explain by what process their original and internal territorial rationality was transformed into a decision.

We adapted Linblom's (1977) explanatory concepts for identifying human institutions and activities in the world political economic system. He identified authority, exchange, and persuasion as the mechanisms primarily at a society level. The three concepts encompasses the micro- as well as macro analytical levels, ranging from an individual to a society. These three concepts are also applicable to the business world because the business world is, of course, a part of the society,

and can not escape the external intricacies of it. However, the business world's dominant factors among authority, exchange, and persuasion would have different relative importance in the business world and in society at large. Yet, the same mechanisms would prevail in the business world.

We differ from Linblom particularly in the concept of persuasion. Linblom's notion of manipulated adjustments among participants assumes that all the members are intensively involved in all the decision-making processes. Many occasions and situations force active participants to become non-participants or indirect participants. The reasons are due to limited human capacity (Simon, 1958) , energy level and intended delegation based on specialized knowledge. Our notion of persuasion is based on changes in knowledge-in-practice based on added, corrected, and diffused information and knowledge.

Authority, in this paper, means the power inherited from the position a territorial entity has in relation to other territorial entities. Exchange refers to power coming from the resourcefulness of a territorial entity. Persuasion refers to power based on the quality and quantity of information and knowledge-in-practice a territorial entity holds. The three kinds of power-- position-based, resource-based and knowledge-based power -- may be interchangeable and may overlap at times. The purpose of identifying three concepts is not in order to divide an action into three separate modes, but in order to explain the major threads of the transformational modes which are partially overlapped and interwoven into one action. However, identifying the primary mode of a transformation is critically important in understanding patterns of interactions among territorial entities. In this research, authority refers to a position-based transformation, exchange refers to a resource-based transformation, and persuasion refers to an information/knowledge-based transformation (See Figure 2).

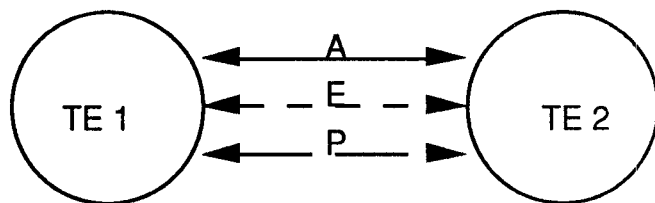


Figure 2: Transformational Modes

Transformational modes explain how a territorial entity communicates with other entities in order to make a decision. These modes influence the basic characteristics of the interactions among territorial entities. For example, the extreme case of a territorial entity whose transformational mode is heavily based on authority would resemble a bureaucracy. By the same token, if a territorial entity uses persuasion or a knowledge-based transformational mode as its

primary mode, its territorial rationality would resemble that of a technocracy⁹.

Integrating Territories

Integration of information systems involves integration of territorial rationalities. Territorial entities wish to have control over their share of integrated information systems, because the systems domain represents the managerial domain. The hegemony over information systems and technology is critical to decision-makers because they assume that they are responsible largely for maintaining and expanding their established managerial domain. Therefore, conflicts among different territorial entities are embedded in the integration of information systems. If we can observe where the conflicts are likely to occur and what themes are likely to be upheld by different territorial entities, we can predict what kind of integrated information technologies and systems would best serve a specific organization.

Based on our field research in the insurance industry, financial industry, manufacturing industry, and educational institutions, we found that the primary conflicts lie in two dimensions: One is the conflict between local and global levels and the other is the conflict among local entities. Regardless of differences among the local entities, we found that there exists a common platform among local entities and global entities

- A transformational mode primarily derived from authority (position-based power) facilitates the themes including local autonomy and global control for local entity and global entity, respectively.
- A transformational mode primarily derived from exchange (resource-based power) tends to escalate the contending themes such as resource alignment and resource allocation.
- A transformational mode primarily derived from persuasion (information-based power) tends to escalate the themes including knowledge specialization and knowledge diffusion.

The likely range of changes in territorial entities as a result of systems integration is from a few major territorial entities competing for hegemony over the integrated information systems, to a central dominant territorial entity that serves as an umbrella for territorial entities that are based on work units for streamlined operation of integrated information systems, to zigzag-shaped territorial entities mixed of vertical and lateral coalition for collaborations in knowledge about and internal campaign for marketing of integrated information systems.

⁹ This argument is different from the conventional assumption that if an organization's organizational structure is either hierarchical or centralized, it might always behave like an hierarchical or authoritative organization.

CONCLUSIONS

This research has developed concepts for explaining, diagnosing, and predicting divergent organizational responses to systems integration. The findings of this research have also shown that a mismatch between the planned domain of integrated systems and the managerial domain escalates the contending forces for and against the systems. The contention is based on the organization's multiple territorial rationalities.

The findings suggest that three inter-related areas need to be analyzed when integrating disparate information systems: (1) the characteristics of the territorial rationalities held by the territorial entities involved, (2) the combinations of the modes of transformation among the participating territorial entities, and (3) the platform of the contending themes of territorial entities. Analyzing the above three areas would provide a basis for an answer to the critical questions concerning conflicting and competing forces for autonomy versus integration in organizations. We view integrated information systems to be like any other kind of information systems in that they are transformed from the development to the implementation stages in order to adapt to the needs of organizations. Knowing the constraints and interests of different territorial entities will speed up the integration process and enhance the understanding of both technological and organizational demands and capacity, which in turn make institutional transformation and technology diffusion more effective.

Managers need to understand that diffusing integrated information systems takes a broader institutional transformation. This is why clearly identifying territorial entities, territorial rationalities, and transformational modes would lead us to understand the fundamental mechanisms that induce the difficulties associated with systems integration. It is also important to note that communication itself may not be a panacea for easing the difficulties associated with systems integration. Communications have to be conducted in a way that identifies territorial rationalities.

In terms of technical choices in DBMSs, interface technology between historically developed disparate systems will be the majority of the technology that firms will opt for, at least until they can revamp the systems to a totally standardized system. Even then, there will soon be a more advanced system waiting for an adoption. Unless the issue of "connectivity" (physical and logical connectivity) among disparate systems is solved, there will always be incompatibility problems among disparate systems.

To test and extend our conceptual and preliminary field research, further comparative empirical research needs to be conducted in various contexts, evolutionary stages, and settings of organizations and different kinds of integration of information systems and technologies. This would validate or refute our work and extend our understanding of interactions

between organizational workings and integrated information technologies.

Based on this research, we can now ask the following question: What kind of forums and interface technology are needed in order to facilitate organizational as well as technical connectivity?

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