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Bounded Rationality, Formal Implementation Processes, and Conflicting Subcultures: A Theoretical Framework

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Abstract

This paper develops a theoretical framework for studying how the interaction of individual perceptions, an organizations' subcultures, and formal information systems (IS) design processes influence the fit of an IS to its respective organization. Building on models of individual decision making, such as bounded rationality, it extends several propositions for how informal and formal structures influence the fit of an IS.

Introduction

Effectively examining the success or failure of IS implementation requires scholars to articulate multi-level theories and approaches for exploring IS linked perceptions and processes within organizations. Rooted in the organization theory literature, this paper develops a theoretical framework for studying the interaction of social structures and individuals in the IS implementation process. First, it briefly defines social structures and information system's fit. Next, it examines how bounded rationality frames individual and organizational perceptions of structures-IS fit. Then, it explores irrational explanations for individual behavior and structure formation. Finally, drawing on Markus and Pfeffer (1983), it then identifies how system's design processes may contribute to fit or misfit among individuals, structures and technologies in organizations. The paper concludes with implications for practitioners and directions for future research.

Social Structures and Information Systems Fit

IS implementation involves creating or adapting an information technology (IT) to meet identified organizational needs. Implementation processes are embedded in recursive relationships between individuals, the technology and social structures (Orlikowski, 1992). Social structures are rules or norms that guide human understanding and action. Formal and informal social structures influence the system's implementation process. They are created by the interaction of human action, existing social structures, and artifacts like IT (Giddens, 1979). Social structures represent ways of understanding

that persist over time. They define parameters of human interaction and applications of knowledge within organizations [see Orlikowski (1992) for a more detailed review of structuration theory].

Within organizations, actors interact with structures and technological artifacts to shape the outcomes of IS implementation. Many scholars (e.g. Pinsonneault and Kraemer, 1997) suggest that managers use formal structures to manipulate technology's features and institutionalize control over employees and resources. From the managerial perspective, an information system is successful if its use "fits" the organization's formal goals and structures (Markus and Pfeffer, 1983). If individuals perceive IT as "fitting" the social landscape, they will be more likely to adopt and use new applications (Barki and Hartwick, 1994).

Rational Links Between Individuals, Organizations and IS implementation

An array of experiences, perceptions, and shared social understanding frames individual IS decisions. When decision making, individuals' satisfice (Simon, 1976). March and Simon (1958) suggest that individuals lack the capacity to consider all available information and alternatives. Their decisions are "bounded" by cognitive and environmental constraints. As a result, decision-makers may "rationally select" a sub-optimal alternative.

Organizational IT implementation outcomes may be perceived as resulting from rational aggregations of individual preferences. Rational approaches suggest, "organizations typically exist to further the common interests of groups of people" (Olson 1971: 7). Individuals join and participate in groups when they perceive an alignment between personal and group interests (Schattschneider, 1975). Within organizations, subcultures reflect accumulations of people with shared interests. Their shared understanding and value systems may be perceived as structures that are the aggregation of individual interests. At the organization level, the "rationality" embedded within individual behavior and subcultures shapes the development of social norms and perceptions of fit between IT, IS implementation efforts and the social environment (McKeen et al, 1994).

Irrational links Between Individual Behavior and Organizational Structures

Rather than focusing on rational explanations, many theorists offer emergent or cultural explanations for human and organizational decisions, such as IS acceptance (Powell and DiMaggio, 1991; Orlikowski, 1992). They assert that social structures shape individual decisions and are, in turn, shaped by ensuing behaviors (Giddens, 1979). From this perspective, organizational rules and outcomes cannot be aggregated as the exclusive product of individual preferences. Rather, perception, influenced by factors such as cultural rules, social norms, and personality, shapes group and individual behavior (Cote and Sanders, 1997; Powell and DiMaggio, 1991; Selznick, 1996; Weick 1995). This view suggests that actions and trends need to be placed in their cultural and historical context. Individuals make sense of their world based on an understanding of the past and expectations about the future (Weick 1995).

Irrational explanations suggest that it is difficult, if not impossible, to clearly articulate the goals of complex processes such as IS implementation. Selznick suggests that organizations should be perceived as “a loose coupling and even organized anarchy” of interests (1996: 275). Individuals possess conflicting goals, values, norms, and cultural institutions. They draw on organization and non-organization specific normative constructs, such as professional value systems, to develop rules for appropriate behavior in the workplace (Abbot, 1988; Garcey, Wholey, and Barefield, 1996). Shared understandings of what are appropriate and inappropriate behaviors draw boundaries around individual and organizational understanding of IT. Because they set boundaries, shared social structures become “both a source of inertia and a summons to justify particular forms and practices (Selznick 1996: 273)” during information systems implementation.

Within loose conglomerations, shared understanding may be lost between conflicting subcultures. Schein suggests that most organizations have three cultures – operators, engineers and executives. Operators “make and deliver the products and services that fulfill the organization’s basic mission.” Engineers design and monitor the “core technology that underlies the organization.” Executives, as managers, are a “global community ... who share a common set of assumptions ... based on their status and role (Schein, 1996: 236-237). Within organizations, each group will attempt to optimize its interests. When an information system is implemented, subcultures will compete with other “couplings” of interests over scarce resources such as training or equipment. This literature suggests that successful IS project managers will mediate conflict between subcultures (Griffith and Northcraft, 1992).

Rational and Irrational Systems Design

Bounded rationality, fuzzy organizational goals, and conflicting subcultures frame information systems development, implementation, and adaptation. Upon introduction, scholars (e.g. Markus and Pfeffer, 1983) suggest systems will be more likely to be used if they are perceived as “fitting” their organizational environment (Markus and Pfeffer, 1983). Group members will define successful IS innovations as reflecting, or having the potential to reflect, existing skills, knowledge, and structures in organizations (Barley, 1986; Rogers, 1995). In reality, a useful information system leverages resources embedded within individuals, artifacts, and social structures to yield greater productivity. In short, systems development processes need to develop products that use and distribute resources in a manner which is perceived as fitting, and that actually re-combine, existing social structures and resources.

In this context, how to design and implement systems that actually exploit, and are perceived as consistent with, an organization’s features become salient. When examining accounting and control systems, Markus and Pfeffer (1983) suggest that the best way to predict IS success is whether people designing a system have congruent or incongruent goals. They maintain a rational design will reflect congruent goals within the organization. If rational, IS will promote task performance, enhance decision-making processes, and reinforce existing power structures in the organization. Markus and Pfeffer (1983) maintain that irrational design occurs when participating groups have inconsistent goals. When groups pursue local agendas, rather than organizational goals, they design information systems that are inconsistent with existing political and social structures within a firm. It is the contention of this paper that rational design is preferable to irrational design and that rational design will be more likely to lead to systems that are accepted.

If it does not reflect the social and political landscape, end users will resist an information systems implementation. Resistance should be understood as “behaviors intended to prevent the implementation or use of a system designers from achieving their objectives (Markus, 1983: 433).” Resistance will be generated by conditions “that are mismatches between patterns of interaction prescribed by a system and the patterns that already exist in the setting into which the system is introduced (Markus, 1983: 438).” When this occurs, users will act in a manner that preserves the status quo. Their actions will be consistent with the shared understanding embedded in social and political structures.

A Model of IS Implementation Success

This review of rational decision-making, irrational social structures, and systems design underscores the importance of individuals' understanding of group interaction within the IS implementation process. Figure 1 shows a model that links the individual, formal structures, and informal structures to design outcomes. Reflecting the work of Giddens (1979), this model suggests that the interaction of an individual's perception, the systems design process (formal structure), and subcultures (informal structure) shapes the information systems' perceived fit with the organization in terms of a rational or irrational design process. The model suggests a number of propositions.

This model departs slightly from structuration theory (e.g. Orlikowski, 1992) and the information systems design literature (e.g. McKeen et al, 1994) in that it proposes that human agents, specifically individual perceptions, are the antecedent (as opposed to a mediator) to both formal and informal structures. Consistent with the structurational viewpoint a recursive relationship is posited. Individuals take actions that reflect their understanding of the world. These actions are shaped by and help enact the shared understanding embedded in an organization's formal and informal structures. The following pair of propositions are derived from the above:

Proposition 1a: *Individual perceptions influence, and are influenced by, formal IS implementation structure.*

Proposition 1b: *Individual perceptions influence, and are influenced by, subcultures.*

This model posits that formal and informal structures can influence the perceptions of IS fit within the organization. Fit can be seen as an IS being consistent with an organization's features, goals, and structures (Markus and Pfeffer, 1983). In particular, fit can be seen as either rational or irrational. It is well established that end-user participation in the formal design processes is a critical determinant of IS acceptance (Hartwick and Barki, 1994). It is less well documented how users' informal participation in subcultures is linked to the formal design processes and to implementation outcomes. Since it can be argued that participation increases the likelihood of perceived IS fit within the organization, it is reasonable to conjecture that individuals from diverse subcultures will be better able to influence how the IS implementation effort is perceived. It can also be argued that the formal structures can affect informal structures. If there is a balance between formal structures and subcultures organization members will be more likely to perceive the IS as rational. The following three propositions are derived from the above arguments:

Proposition 2: *The greater the degree of formal IS implementation structures the greater the perceived rationality of the IS.*

Proposition 3: *Involving participants from diverse subcultures in systems implementation will influence the perceptions of fit, such that the greater the number of subcultures involved the greater the perceived rationality of the IS.*

Proposition 4: *Formal IS implementation structures influence organizational subcultures.*

Conclusion

Drawing on theories of decision-making and organization culture, this paper has developed a conceptual model linking individual perceptions, formal information implementation mechanisms, and informal subcultures to IS-Organization fit. It suggests that a balance between internal subcultures and their congruence with formal design processes should yield individual perceptions of rational IS implementation fit with the organization. It contributes to the IS implementation literature by developing a theoretical description of how imbalance among informal subcultures can disrupt IS implementation efforts.

Prior to implementing technologies, this paper suggests that managers carefully consider their organizations' culture. Independent of the IS implementation effort, conflict between cultures and organizational structures may undermine user confidence in new IT. If organizations foster congruent cultures and structures, managers will minimize conflict and foster perceptions of IS fit with the organization. By doing so, managers will provide an organizational climate which facilitates adoption and use of the technology.

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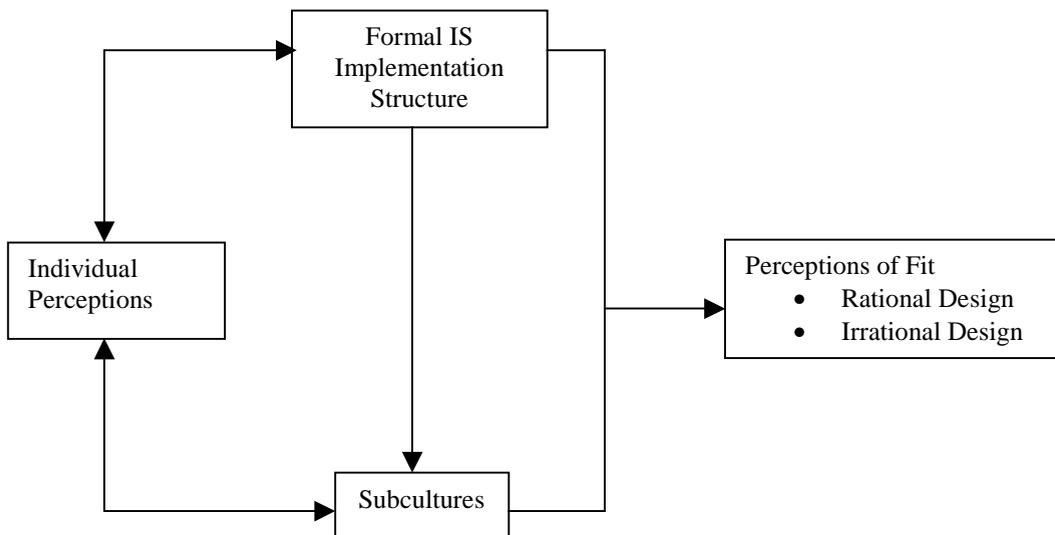


Figure 1
Model of IS-Organization Fit