Theory Driven Organizational Metrics

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INTRODUCTION

The inability to establish first principles has kept organizational theory from being successful. Moreover, due to snapshots in time and researcher biases, case studies are limited to hindsight, rather than serving as a proactive source of solutions to organizational problems. Yet case studies guided by theory have illuminated and tested the first principles that we have discovered. Unlike simple Newtonian mechanics, however, social-psychological mechanics among organizational members are hidden behind and within explanations and discourse, eluding a science of fundamental interactions. When an interaction stops for measurement (e.g., case studies), significant information from the collapse of organizational interdependence is lost. The path forward is to predict the uncertainty left from the collapse of interdependent variables: planning and execution; or resources and time. In this article, we develop a new organization theory; in a related article ("Restructering a Military Medical Department Research Center" in this encyclopedia), we apply the theory to a case study of a military medical research center (MDRC) with access to advanced information systems (IS), yet struggling to determine the quality of its residents in training, and their scholarly productivity.

BACKGROUND

Organizational theory has failed to produce predictable (Pfeffer & Fong, 2005) or replicable results (Weick & Quinn, 1999). Traditional organizational theory, generally based on (MI) (e.g., game theory; in Nowak & Sigmund, 2004), assumes that open information from individuals is stable and freely accessible (Baumeister, Campbell, Krueger, & Vohs, 2005), making an organization a rational aggregation of the contributions from its individual members. Yet defining rationality as "normative consistency," Shafir and LeBoeuf (2002) concluded that neither average humans nor experts make consistent choices, preferences, or justifications, undercutting the traditional model of rationality. Agent-based models (ABMs) based on MI with the same assumption about rational aggregation have had to discount the value of prediction as a consequence: "the value of a [computational] model is not prediction but insight" (Bankes, 2006). But to successfully operate an autonomous computational organization in the field (robot teams, human-robot teams, and networked and virtual organizations), a rational process using information systems (IS) and technology (IT) to formulate predictions is necessary to protect humans, the environment, and to ensure the execution of missions.

THEORY AND ORGANIZATIONAL METRICS

In contrast to methodogical individualism (MI), adopting the quantum uncertainty relations as first suggested by Bohr (1955) and Heisenberg (1958), has begun to successfully model interdependent uncertainties in human social interaction (Lawless, Castelao, & Abubucker, 2000) to predict decision-making among human organizations in the field (Lawless, Bergman, & Feltovich, 2005), and to study organizations in the laboratory (Lawless, Bergman, Louca, & Kriegel, 2006b). Subsequently, online metrics based on the "measurement paradox" have been proposed (Lawless & Grayson, 2004).

The paradox indicates that measuring an interaction or organization collapses the existence of its interdependent information into strictly classical information that cannot be aggregated to reconstruct the organization (Levine & Moreland, 1998), nor apparently even to reconcile differences between individual beliefs and actions—despite more than 30 years of research, no better than a weak link has been confirmed between selfesteem and actual performance at school or in the workplace (Baumeister et al., 2005). In addition, it has been known for some time that surveys or case study interviews fail to generate information that can validly predict individual and organizational change (Eagly & Chaiken, 1993). But surprisingly, the measurement paradox suggests that the collapse of interdependent information can be exploited to favor one of two interdependent states in the mathematical model of interdependence to produce predictable outcomes under certain rather extreme conditions, such as the difference between consensus (CR) versus majority rule (MR) decision processes in organizations (Lawless et al., 2005): It has been predicted and found that CR leads to less concrete decisions less welcomed by an organization's customers, but at lower resource expenditures that take longer to process; in contrast, MR leads to more practical decisions more welcomed by customers, but with more conflict and resources expended that quicken decisions.

The development of a complete theory of organizations, however, requires concepts beyond extreme situations to more general cases. Recognizing that two stories are always possible (Wendt, 2005), the measurement paradox arises because no better than one story at a time is ever collected during measurement. Further, the relationship between decision processes and organizations is itself complex, especially for CR. The purpose of CR is to convert the neutrals in a group into active individual participants (Bradbury, Branch, & Malone, 2003). However, the process in CR that suspends the criticism of beliefs no matter how bizarre lends itself to being hijacked: "The requirement for consensus in the European Council often holds policy-making hostage to national interests in areas which Council should decide by a qualified majority" (WP, 2001, pp. 29). Organizations are primarily hierarchical and governed by a single leader or command decision-making (CDM), making the link to CR more obvious under the control of multiple leaders (e.g., the leadership crisis at Unilever prior to 2005; the current management crisis at Europe's aerospace EADS group that includes Airbus). However, single leaders using intimidation or even violence can convert an organization or system into a quasi-CR process that stifles widespread criticism; for example, Germany's lack of response in 1934 from its citizens or institutions to the multiple murders during Hitler's "Night of the Long Knives" (Benz, 2006, pp. 54). But, counter-intuitively, instead of actively seeking consensus (CR), it has been found that the most robust consensuses are derived during competitive decision-making (i.e., MR), more learning occurs under competition (Dietz, Ostrom, & Stern, 2003), and the more competitive is a team, the greater the cooperation among its members (Lawless et al., 2000)[1].

In addition to laboratory studies, the paradox has been exploited by proposing the first mathematical set of interdependent metrics designed to measure the real-time performance for a system of military forecasters in the field (Lawless, Bergman, & Feltovich, 2006a). These metrics were revised and extended to analyze the reorganization of IT services provided by the Management Information Service Center (MISC) at a major university in Europe to test first principles that were then used to reverse model terrorist organizations (Lawless et al., 2006b). Mindful that a case study reflects a static snapshot in time which exposes the findings from a case study to confirmation bias (Eagly & Chaiken, 1993), the potential for biases were countered with a theoretical foundation directed at two sets of two interdependent variables (in Figure 1, planning and execution; resources and time). Based on these four interdependent variables, it was found that corruption at MISC and its university occurred by operating without a structured business model (BM). The lack of a focused BM for the university had led to a disorganized assemblage of faculty, staff, and students that discouraged innovation, promoted administrative malfeasance, and resource mismanagement, impeded student progress and faculty research, and significantly reduced opportunities for MISC and its university. The conclusion followed that a loose aggregation in the limit approaches a CR process, in that less information is processed by the organization than its members, consequently precluding organizational learning and change in response to environmental perturbations (Dietz et al., 2003). The results helped to specify a computational model of an organization with artificial agents that could be used as a test laboratory for organizations, and also used as

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