Interaction Value Analysis: When Structured Communication Benefits Organizations

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We present a mathematical model that predicts and explains the circumstances under which a management-defined communications tructure can add value to an organization. This model provides a game-theoretical basis for contingent organizational design by relating empirical observations of real organizations to the solution of a rational choice model based on game theory. We constructed a multiple-player, noncooperative game in which players have full knowledge of, and universal communication access to, each other. These players allocate the scarce resource of their attention among potential interaction partners. It struck us thatt his game sometimes did and sometimes did not have a "core," i.e., a confluence of individual optima (Nash equilibrium) that was also optimal for the whole group. Some circumstances allow the best structure to emerge from many individual decisions, whereas other circumstances require the imposition of structured communication channels by a central decision maker. Strong management control of communications tructure adds no value in business environments where the game has a core-i.e., where a centrally imposed optimum would dictate the same communications patterns as those defined by the Nash equilibrium that emerges spontaneously when each participant optimizes locally. Trade in an ideal market is the iconic example of such environments. In our model, other combinations of conditions fail to yield a core, even though a single stable Nash equilibrium always exists. The difference between aggregate effectiveness at the Nash equilibrium and the maximal feasible aggregate effectiveness that could be centrally dictated is the value that management can provide through enforcing the globally optimum communication regime. The predictions of this simple model about the conditions that favor more-or- less-structured communications agree surprisingly well with accepted organizational contingency theory. Our simple model thus provides a sound theoretical foundation for many aspects of contingent organizational design.