Recruitment Portfolio Games

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INTRODUCTION

Games have proved to be unsatisfactory for research, especially in the study of computational autonomy. We have hypothesized that the social nature of humans means that controlling autonomy is a function of mastering social interdependence, unsolved presently. In our program of basic research on interdependence, we have first construed the common multiple interpretations of social reality as a bistable model (e.g., bistable illusions; we use them as an analogy of the tradeoffs that managers make when recruiting new employees). To supplant game theory, which has proved to be unsatisfactory, we review game theory and its problems and we describe how serious games may replace it. Our serious game deals with recruitment for organizations.

In this article, we review the background of our past research, game theory, an adaptation of portfolio theory with an example, using Monte Carlo simulations, serious games, future research, and conclusions. As a brief introduction, individuals are poor at multitasking (Wickens, 1992). However, the purpose of organizations is to multitask, placing a premium on recruitment. But if recruitment produces a net redundancy of skills, the less effective an organization becomes.

BACKGROUND

In past research, we have concluded that organizations work best when they enforce cooperation in the performance of an organization's mission (Stevens and Campion, 1999), but this cooperation if successful would make an organization less adaptable to future change (Lawless et al., 2010b). As part of a tradeoff, the managers of an organization might be able to become more adaptable by recruiting different mixes of talented individuals. In that situation, we predict that an organization's management is trading off their organization's present stability for future adaptability (Lawless et al., 2010a; Schneider and Northcraft, 1999).

But managers seldom work as planned. Per Mintzberg (1990), "**I**f you ask managers what they do, they will most likely tell you that they plan, organize, coordinate, and control. Then watch what they do. Don't be surprised if you can't relate what you see to these words." Similarly, Bloom and his colleagues (2007) found a negligible relationship between what managers believe about their business and what actually happens to it.

We try in our study of recruitment for an organization to present an element of a new "smart" or serious game that improves rationally on recruitment. The basic idea is for an organization to avoid its inability to adapt by constructing a "portfolio" of skilled employees with little in common. For example, if an organization of two individuals needs one carpenter and one ditch digger, it does not help the organization to hire two carpenters and then retrain the second one to dig ditches. One reason given for hiring two similar individuals is cultural, in that organizations might have a history of recruiting individuals with common backgrounds in order to reduce intra-organizational conflict (Zetland, 2010).

It might be more useful to think of the skills an organization needs as nearly "orthogonal." That is, we want each individual to have some understanding of the other's skill set (or else coordination might be more difficult), but we don't want too much of an overlap

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(think of a Venn diagram where the overlap in skills can be modeled with Bayes theorem). If in designing a printed circuit board that goes into an application that will experience "stress," an organization would want an electrical engineer and a mechanical engineer. Having two of either would not be helpful for this problem, but having specialized engineers that they do not share a common vocabulary and engineering understanding would make the project very difficult, but conflict in teams and organizations actually improves an organization's performance (Hackman, 2011).

In organizations we are writing about, the complementary skill sets are likely to be social skills (positively correlated, and with significant overlap in the Venn diagram), and not so much the educational and professional skills (negatively correlated, or with little overlap in the Venn diagram). These soft skills are the mixture of perspectives, experiences, backgrounds, ways of examining issues, ways of problem solving, etc., so that we create that portfolio of "complementary" skills.

Alternatively, the more "nearly orthogonal" the people in the organization, then the more difficult (time consuming, less efficient, more demanding of management) becomes the efficient execution of plans. This difficulty would create a tension between competing objectives (a question for future research in whether resolving the tension is like the operating on the efficient frontier in portfolio management).

Presently, serious or smart games are having an impact on decisions in management, education, defense, scientific research, health care, emergency planning and other fields. But how effective are they? What role might training play? For those in the businesses of serious games, these games create opportunities and challenges that may generate large investments and large returns. In areas ranging from design to programming, psychology to mathematics, and management to politics, smart games present new business opportunities. But to maximize the potential, more must be understood about this new tool.

We begin by recognizing that an organization, to be effective, multitasks with the minimum of redundancy (Ambrose, 2001). In contrast, individuals cannot multitask effectively (Wickens, 1992).

GAME THEORY

Game theory is a process that maps out outcomes from models of interdependence drawn from real life situations (Shoham, 2008), Scientists determine the value of these outcomes and award scores to participants based on the choices that they make when playing a toy game, not solely determined by winning or losing. Game theory attempts to take human emotions such as trust, pride and selfishness into account as well as pitting friends or mates against each other. An example of these games is the Prisoner's Dilemma Game (PDG). In playing PDG, two participants play the role of two suspects picked up by the police, separated so that they cannot communicate, and pressured to confess (D for defect from the friendship). When one participant confesses and the other does not, one suspect is released earlier ("wins") while the person who did not defect gets a hefty but not maximum sentence ("loses"). A worse outcome occurs when both confess (D-D); if both confess they each would have to serve the maximum term. On paper, these two sets of choices are not as favorable to them as when neither confesses at all (C-C for cooperation between partners). In that case, they would split the maximum winnings.

But the lack of communication or coordination between the participants makes this solution unstable (see Table 1). Surprisingly, however, Nash (1951) proposed a simple solution to PDGs that has since become known as the Nash equilibrium (NE). It is a point of stability or equilibrium that occurs when both participants defect (D-D). Axelrod (1984) countered with his own solution to the NE solution with his "tit-for-tat" method in repeated games by having a participant always choose to cooperate with first choices, but defecting whenever the partner defected.

Axlerod (1984, p. 7-8) believes that Nash equilibria led to the worst social welfare outcomes: "the pursuit of self-interest by each [participant] leads to a poor outcome for all" that can be avoided when sufficient punishment exists to discourage competition.

But his solution requires multiple plays which indirectly permit communication because of the experience that participants gain of their partner's prior actions. There are numerous other problems with