The Mythical Decision Maker: Models of Roles in Decision Making

Csaba Csáki
University College Cork, Ireland

INTRODUCTION

During the history of decision support systems (DSSs)—in fact, during the history of theoretical investigations of human decision-making situations—the decision maker (DM) has been the centre of attention who considers options and makes a choice. However, the notion and definitions of this decision maker, as well as the various roles surrounding his or her activity, have changed depending on both time and scientific areas. Reading the DSS literature, one might encounter references to such players as decision makers, problem owners, stakeholders, facilitators, developers, users, project champions, and supporters, and the list goes on. Who are these players, what is their role, and where do these terms come from?

This article presents a review in historical context of some key interpretations aimed at identifying the various roles that actors may assume in an organizational decision-making situation.

BACKGROUND

Decisions may be about a personal situation, organizational issues, or societal problems. They may relate to one individual, a group, many people, or a whole country. Decisions may be made by one leader, a group of experts, or by counting the votes of millions. Let it be a simple yes-or-no choice or a complicated generation and selection process of complex alternatives, it is key to identify who is affected and what roles they play or are allowed to take. To provide effective support for making decisions, or more precisely for people who make decisions, it is crucial to have a view of who is to be supported and who else is involved or concerned. Knowing the actors involved and mapping their relations to the issue and each other is crucial in understanding any decision situation and in being able to provide support either in the form of consulting and facilitation or through an aid or software tool.

MODELS OF DECISION-MAKING ROLES

Economics and Mathematics

The earliest scientific investigations into the nature of decision making approached the problem from an economic point of view: how individuals make (economic) decisions in order to maximize their benefits. To calculate those benefits, it was necessary to judge probabilities. Thomas Bayes (1764/1958) developed the theory of personal probability when he recognized the importance of conditional probabilities of events: Bayes' theorem explains how the calculated likelihood of certain events changes in the light of new information (for details, see, for example, Baron, 1995). Bayesian mathematicians are mostly concerned with issues of statistical evidence. There is no specific person the issue or problem belongs to: The problem is addressed at the abstract level, with no notion of individual preferences of a decision maker.

Adding values to probabilities developed into the idea of the rational decision maker whose goal was to collect all information and use a model to determine the best course of action, where best is defined as the optimal solution. Expected utility theory is rooted in the observation by Daniel Bernoulli (1738/1954) that expected monetary payoff was inadequate for reasoning about economic choices to be based upon. He argued that people considered the moral worth of an alternative and that the utility of money was logarithmic. It took another two centuries for utility theory to reach its final formalism and axiomatic foundations (Ramsay, 1931/1964; Savage, 1954; von Neumann & Morgenstern, 1947). A rational decision maker would exhibit

certain characteristics (usually expressed in the form of axioms), and then the solution of certain problems (expressed in a formal way) may be solved based on sound mathematical principles. This approach was very much concerned with the right decision irrespective of the individual. It was the era of the "economic man": He is "armed with complete information about alternatives and their consequences simply select the one that maximizes their utility" (Langley, Mintzberg, Pitcher, Posada, & Saint Macary, 1995).

There are other quantitative decision-making practices aside from game theory and the various forms of utility theory. Historically, the first organized activity in the scientific analysis of decision making was operations research (OR), which emerged during World War II (Howard, 1968). OR has evolved into the area called management science, but the principles of decision analysis (DA) also have their roots in OR. The most important common feature of these streams of the decision sciences regarding players is that they do not analyze organizational situations and roles: The main role they consider is the decision maker who is facing a (usually) multiattribute problem.[1] Mathematical models of decision analysis incorporate the preferences and probability assumptions of the decision maker along with the structure of the decision problem. Decision is considered to be an irrevocable allocation of resources, and the decision maker is an individual who has the power to commit the resources of the organization (Matheson & Howard, 1968). Although DA narrows in on organizational decisions, it is mostly concerned with the appropriateness of the decision-making process rather than the individuality of the decision maker or the relations of power holders within an organization. Later forms of DA did attempt to include in their thoughts the result of prospect theory. Namely, they tried to integrate biases of human judgment into their model-building processes (Howard & Matheson, 1989).

Challenges on the Rational View

The first serious challenge of the mathematical or economic notion of rationality was raised by the work of Simon (1957) and, as a result, the notion of "bounded rationality" and the corresponding decision-making behaviour was born. Simon's decision maker is the "administrative man" working under the condition of limited capabilities. This decision maker is committed to a midcourse between omniscient rationality and intuition. He or she follows a cognitive process that consists of a simple sequence of programmed steps and does not go for the absolute solution or the best possible solution. Instead, using heuristics or rules of thumb, he or she seeks (in a sequential process) a so-called "satisficing" result to the issue at hand. At the same time, related literature had still ignored individual abilities and corresponding differences of decision makers.

The need to understand real decision-making behaviour of both individuals and organizations had led to a different attack on the general view of a rational decision maker, this time launched by psychological research. The basic axioms of rational behaviour seemed not to hold for human decision makers, and behavioural decision theory developed the concept of cognitive bias (Slovic, Fishhoff, & Lichtenstein, 1977; Tversky & Kahneman, 1974). Biases may concern the availability of information, the judgment of risk, or the need to feel protected from negative outcomes. Researchers identified a limited number of inferential rules used by participants to simplify difficult mental tasks. They also pointed out the importance of situational frames. However, these frames and biases have serious side effects on the logic of decision making. Behavioural decision theory revolves around the image of a problem owner, meaning that there is no problem to be solved without someone facing the issue, therefore, in most cases, it is no use to talk about a general solution.

The differentiation of the decision maker and the problem owner as well as the shift from a rational to a not-so-rational view of behaviour had resulted in new approaches in the management and administrative sciences.

Management and Organizational Theories

It was Chester Barnard (1970) who placed decision making at the core of the functions of the executive. Since then, the literature of management sciences has become enriched in interpretations and models of who (and who else other than the decision maker) is involved in making decisions.

Langley et al. (1995) asked for a richer conception of the roles involved in organizational decision making. They point toward tacit knowledge in the minds of various expert employees. They identify the following aspects of a decision maker: