: What is required in an evidence-based decision process?

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Effective decision making is a well-worn concept, but specifically it refers to making decisions that result in attainment of desired goals relevant to an initial or original decision question. Ideally, an evidence-based decision process uses the best available facts in a structured thinking methodology that helps make choices to attain those relevant goals. An evidence-based decision process **must** be comprehensive, systematic and thoughtful. The process **must** elicit facts and evidence that is subsequently used to inform a reasoned choice among relevant alternatives.

According to Pfeffer and Sutton (2006), "The decision-making process used at Oxford's Centre for Evidence-Based Medicine starts with a crucial first step — the situation confronting the practitioner must be framed as an answerable question. That makes it clear how to compile relevant evidence." The FreeDictionary defines evidence-based decision-making as a "type of informal decision-making that combines clinical expertise, patient concerns, and evidence gathered from scientific literature to arrive at a diagnosis and treatment recommendations." Power (2017) reviews multiple definitions.

Power (1977) noted "A decision question is a difficult concept to define. Intuitively it is a statement of the central issue which must be resolved by the decision process. A decision question is a function of the decision maker's
conceptualization of his decision situation. The characteristics of a decision question are not clearly specified in the literature. But, the following
characteristics are a first attempt at enumerating this concept. A decision question specifies a question word, i.e. Who, When or How, an action word, i.e. increase, motivate or maximize, the decision maker(s}, the problem
or opportunity in the decision situation and relevant causal relationships. Decision questions are, however, rarely specified by decision makers and this can create ambiguity in the decision process. (p. 4)"

Beginning in 1975, a major stream of my research has focused upon computer-aided decision formulation. Decision formulation identifies and captures the structure of a decision situation including the decision question or questions, the relevant goals, alternative actions, and other appropriate information for formulating a more structured understanding of a specific decision situation. A decision formulation is a precise statement of component elements of a decision situation.

Two major errors occur during decision formulation: 1) premature closure, and 2) defining the wrong decision question (an error of the third kind). These errors have been discussed by a number of

authors.

In a previous work, Power (1977) explained "Premature closure occurs when a decision maker
delimits his evaluation and search for relevant decision
questions, organizational goals or alternative · actions
before his decision set includes an appropriate,
accurate, satisfactory or "best" element. Examples of
premature closure are also often difficult to diagnose
because few decision makers explicitly considPr and
document their alternative decision q uestions, goals or
actions. The problem of premature closure is complicated
by the problem of determining the marginal cost and
marginal benefit which accrues from additional search and postponing closure. But, people must at
a minimum
consider the possibility that premature closure is
occurring at various stages in the decision process (pp. 6-7)."

Mitroff and Featheringham (1974) define the error of
the third type as "the error or probability, of having
solved the wrong problem, choosing the wrong problem
representation, when one should have solved the right
problem, chosen the right representation". Because
managers often fail to define explicitly their decision
questions it is difficult to identify errors of the third
type." Mitroff and Featheringham (1974)
conclude: " ••• one of the most important errors
associated with problem solving, (is) the error of the
third kind." The importance of the third type error is
further emphasized by Peter Drucker (Horton, 1972), who
states that "there are few things as useless - if not
dangerous - as the right answer to the wrong question."

Managers are not infallible decision makers. Rose
(1974) discussed various limitations of people as
components in man-machine systems. People will commit
errors in the decision making process, the question is
can we train people to avoid the most important errors or
minimize the probability that they will occur in
strategic decision situations. The two errors which are
frequently overlooked by decision makers in these
decision situations are premature closure and the error of the third type.

My research has investigated computer-based decision formulation aids. The first system was called DECision AID (Power, 1977). The idea was that an organizational decision making process could be modeled as a "structured set of questions which a decision maker should consider either explicitly or implicitly." The question asked of a person is very important and much consideration has been given to the question technique (Flesch, 1963). DECAID had two categories of questions, substantive and procedural. Substantive questions refer to the decision situation; procedural questions refer to the requirements of the DECAID program, i.e. requests to input alternatives, requests for branching instructions and requests about how the program is functioning (p, 44)."

The DECision AID model relied "on a prescriptive abstraction of the decision making process, i.e. a specification of how a decision should be made, similar to one developed by Harrison (1975). But, the DECAID conceptualization contains three additional phases, i.e. question definition, information evaluation and decision audit. The question definition phase is especially important to the decision making process because both errors discussed previously, the error of the third type and premature closure on a decision question, must be avoided or minimized in this phase (p. 40)."

More research needs to be conducted on computer-based support for decision question formulation. Formulating an accurate and complete decision question is the starting point for any evidence-based decision process. Answering the wrong question with enough evidence still leads to a bad decision.

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