How does your company approach decisions and rate innovation risk?

by Phil Phillips, PhD
Contributing Editor
phillips@chemarkconsulting.net

Rules of thumb, intuition, tradition, and simple financial analysis are often no longer sufficient for addressing such common decisions as make-versus-buy, facility site selection, and process redesign. In general, the forces of competition are imposing a need for more effective decision making at all levels in organizations.

Uncertainty is the fact of life and business; probability is the guide for a "good" life and successful business. The concept of probability occupies an important place in the decision-making process, whether the problem is one faced in business, in government, in the social sciences or just in one's own everyday personal life. In very few decision making situations is perfect information available. Most decisions are made in the face of uncertainty. Chance enters into the process by playing the role of a substitute for certainty - a substitute for complete knowledge.

Business decision making is almost always accompanied by conditions of uncertainty. Clearly, the more information the decision maker has, the better the decision will be. Treating decisions as if they were gambles is the basis of decision theory. We have to trade off the value of a certain outcome against its. . . chance, odds, likelihood, etc. Humans make decisions based on emotions, habits, tradition and convention. These sometimes pay off but most times do not . . . .so . . . we're lucky when they do turn out in our favor.

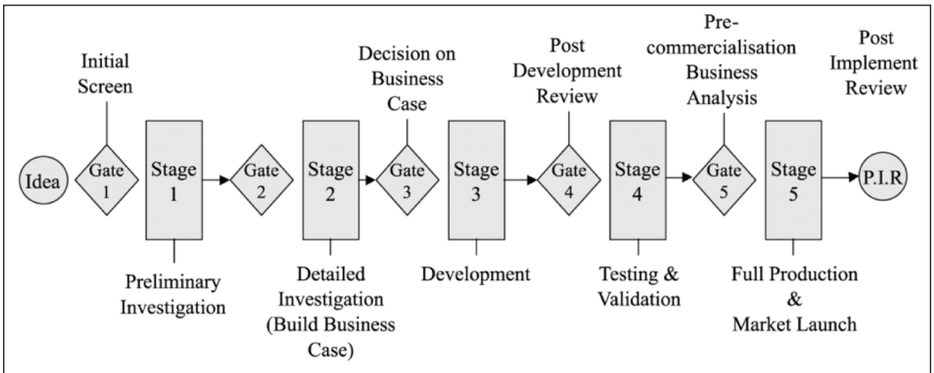
Most decision makers rely on emotions in making judgments concerning risky decisions. Should a pharmacist or doctor involved in developing risk regulation take the emotions of the public seriously or not? Even though emotions are subjective and irrational, they need to be a part of the decision making process because they show us our preferences. The fact that we need emotions as part of our decision-making process can lead to an alternative view about the role of emotions in risk assessment: emotions can be a balancing guide in making judgments about morally acceptable risks.

Often people make choices out of habit or tradition, without going through the decision-making process steps methodically. Decisions may be made under social pressure or time constraints that interfere with a careful consideration of the options and consequences. Decisions may be influenced by one's emotional state at the time a decision is made. When people lack adequate information or skills, they may make less than optimal decisions. Even when they know the statistics; they are more likely to rely on personal experience than information about probabilities. The fundamental concerns of decision making are combining information about probability with information about desires and interests. For example: how much do you want to meet her, how important is the picnic, how much is the prize worth?

Knowledge is what we know well. Information is the communication of knowledge. In every knowledge exchange, there is a sender and a receiver. The sender makes common what is private, does the informing, the communicating. Information can be classified as explicit and tacit forms. The explicit information can be explained in structured form, while tacit information is inconsistent and fuzzy to explain.

Data is known to be crude information and not knowledge by itself. The sequence from data to knowledge is: from Data to Information, from Information to Facts, and finally, from Facts to Knowledge. Data becomes information, when it becomes relevant to your decision problem. Information becomes fact, when the data can support it. Facts are what the data reveals. However the decisive instrumental (i.e., applied) knowledge is expressed together with some statistical degree of confidence.

Fact becomes knowledge, when it is used in the successful completion of a decision process. Once you have a massive amount of facts integrated as knowledge, then your mind will be superhuman in the same sense that mankind with writing is superhuman compared to mankind before writing. The following figure illustrates the statistical thinking process based on data in constructing statistical models for decision making under uncertainties.



Source: Cooper (1994)