Chapter 2
The Risk in Systems Management

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ABSTRACT

Due to the constantly changing environment where any system performs its activity, smooth operation involves assuming a particular risk from the managing system. Thus, a true theory of risk has developed. Along with the theoretical approach of risk, there is also a pragmatic handling of it, meaning the actual way in which it manifests in practice. Highlighting several opinions of specialists, this chapter analyses the theory of risk in general and the risk in systems management in particular. Concurrently with the development of the theory of risk, a theory of attitude has also developed, manifested to risk by the systems managers. This chapter gives special attention to managers’ attitudes towards risk and towards the industrial risk.

THEORY OF RISK

The place and role of risk in managerial activity must be analysed by taking into account the relation where the two concepts about risk are, namely: The concept suggested by the decision theory and concept suggested by the managers of companies. It is necessary to take into account managers’ behaviour before the risk defined by the theory of choice, which leads to the following conclusion: managers actually assume risks and express preferences in terms of risk, using techniques and procedures – other than the traditional ones – such as media, variation of probabilistic distributions of possible outcomes, etc.

Such an understanding of the concept of “risk” by managers leads to a certain attitude they have towards the risk, characterised by three essential features, namely: managers’ low sensitivity to probabilistic assessments of the possible results; managers’ deliberate mobilisation on some key objectives and decisive influence of this mobilisation on the managerial decisions; the clear distinction between assuming the risk by managers and game of hazard.

These features combined with the individual and organisational decisions highlight the impossibility of classical conception of the “risk” to allow a thorough and pertinent analysis of the behavioural phenomenon of assuming the risk.
Defining the Risk in the Theory of Decision

For the classical theory of decision, risk reflects the variations of distributing the possible results, their subjective probability and values. It is measured either by the non-linearity of the money relevant utility, or by the variation of distributing the probabilities of possible winnings and losses for every particular choice. According to the latest formulation, a risky option is that which variation is large for and the risk is one of the assessment elements in order to achieve the expected value of the various possible options. Of course, the notion of risk is included into the vaster notion of choice according to the output expected from a certain option. Virtually, all theories of choice start from the premises that those who decide prefer an increased output rather than a weaker one provided that all other factors (for example the risk) are considered to be constant. They also imply emphasising a smaller risk, when all other factors are constant (the expected value, for example). Thus, the expected value is considered to be a positive element in assessing an option, and the risk as negative element. Therefore, it has not been easy to formulate a satisfactory definition of risk within the limits of a rudimentary framework (media, variation of probabilistic distributions of the possible results, etc.). For these reasons, efforts were needed to develop a new concept about risk, especially for the study of financial markets. Defining the risk following variation was criticised for the confusion it maintains between the negative risk and positive opportunity. This criticism was at the origins of elaborating the patterns based on semi-variation. But these have also been criticised, because they fulfil von Neumann’s axioms, just in certain very limited circumstances. This unsuccessful attempt has incited researchers to try a pattern to assess risk and preferences in terms of risk, based on the prices observed. Most of the contemporary publications dedicated to the risk of financial markets reflect this concept (the pattern of setting the asset price that proved a high closeness to financial analysis, for example). This pattern defines the systematic risk as being the co-variation degree between a given price and market price, and regression is defined as unsystematic or specific risk. Although these mouldings have contributed to a better understanding of financial markets, the risk – output relation suggested by this pattern has not been confirmed through facts.

Using the concept of “risk” outcome from the theory of decision as means to describe the actual behaviour mechanisms in terms of choice raises many additional complications in practice. Thus, there is the possibility that who decides to show a tendency of not taking into account the very unlikely or very far events, whichever their possible consequences would be. There are also situations where just a small part of the possible results is taken into account, the decision being made only according to the extent of the variation of these results in a few hypotheses. Thus, those who decide seem to prefer verbal feedback rather than numerical ones concerning the risk, even if the transformation of the first ones in numerical terms show their high degree of variation and dependence in relation to the context of the problem, and the probabilities of results and their values are independently taken into account, rather than their mathematical product.

All these situations tend to prove that those who decide have a concept of the risk that is very different from the definitions suggested in specialised literature and that various decision makers shall have a different concept for the same situation.

The Risk: Component of the Decision Making Process

The importance of risk in making a decision is given by the location it occupies in the theory of decision, by the rank in the managerial ideology and by the – ascending – interest to assess the management risks. Different from such an approach, most of the empirical studies about deci-