Chapter 7
Basic Measures of Risk of Misinforming

ABSTRACT

This chapter introduces the adopted approach in modeling likelihood and impact of the risk of misinformation. The approach presented here is explored throughout the book and it serves as a foundation to all models developed further. This chapter introduces the variables and parameters in developing a probabilistic model regarding the risk of wrong purchase decision. It defines the parameters that need evaluation in a way to measure the risk of misinformation and proposes a way to collect data. In comparison with the initial model described in the first chapter, the properties of the parameters are extended substantially.

INTRODUCTION

The objective of this part of the book is to develop quantitative measures, models, and data gathering, to allow assessing the risk of misinforming. The basic properties of the approach developed to address the problem of misinforming hazard, and ideas leading to build measures to quantify the probability and impact of the risk of misinforming, as well as definitions of the variables used, are defined in this chapter. In next sections we will elaborate the basic ideas evolved to address the evaluation of the risk of misinforming and explored throughout the chapters in this and next parts of the book.

The variables used in the model developed to measure the risk are defined in the context of an informing process, including only two participating parties – Seller and Buyer. A business case – purchasing by the Buyer a product offered by the

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Seller in a way to fulfil identified by the Buyer needs, to accomplish a set of works, as described in the previous chapter will be used as a context in defining variables used in building models.

Complete set of variables used a cross the book, notations, symbols, definitions, and assumptions are given in the Appendix 1, which can be used as reference.

BASIC MODEL

Assume that there is a set of Buyers $B=\{b_j\}$, $j=1,2,\ldots,N$, where b_j represents the j^{th} buyer. There is also a set of products by $D=\{d_i\}$, $i=1,2,\ldots,M$, potentially suitable for accomplishing the set of K_j works, activities or tasks $A_j=\{a_{kj}\}$, $k=1,2,\ldots,K_j$, the buyer b_j needs to do by using a product from the set D.

Let the Buyer b_j (the indices could be avoided to simplify the formulae, when assuming a single customer or when using indices will not add to understand the meaning of given formula) needs to do a set of works and to find a suitable tool to accomplish them. To do this the customer has to be able to accomplish a set of k works, activities, or tasks, let us mark this set as $A=\{a_k\}$, by using a product $d\in D$. Some of these works may help in solving different problems needed by the customer as well.

For example, a customer b is looking for a PC to watch movies or to listen to music on-line. For both of those activities b needs Internet access, a sound system, and for watching movies b also needs a high-quality screen. Quality access to the Internet is common property to almost all activities b faces and wants to accomplish with the use of this PC. If b needs only to listen to music, she or he needs high quality sound system but may accept lower quality for the screen. Or to obtain a PC that will satisfy all needs of b, the PC must meet the highest requirements for quality to all the works related to all the problems that b wants to solve by using the product.

Subsequently, we will refer to this customer as a customer with set $\{A\}$. The elements $\{a\}$ of A are assumed disjoined and are called works or activities.

$$\{A\} = \{a_k,\ k=1,\ldots,K\},$$

where K is a positive finite integer.

For the above example, the customer is looking to buy a PC. He wants to do word processing, to use the Internet, and many other works with this PC. Or the set $\{A\}$ is {word processing, use of Internet, making calculations, listening to music, play games, etc.}.

Also, let assume that by applying certain methods, devices or services, the activity a_k from $\{A\}$ can be accomplished and the problem can be assessed as solved. We