

Chapter 18

Problem Solving and Risk Management Methodology: Feedback From Experiences With the Use of Taxonomies

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ABSTRACT

Intending to lead organizations to continuous improvement, this chapter proposes a methodology that involves three axes: risk management, problem-solving, and feedback experience. This methodology allows organizations to characterize the experiences they have already confronted, as well as new experiences (which can be risks or problems) with the use of taxonomies established by the organization. It also enables them to capitalize and exploit their knowledge base. This work proposes a best-use approach of the past experiences that are similar to a current event and facilitate their treatment and provide solutions. The authors take the feedback as a point of articulation between the two methodologies because it is a mechanism that offers knowledge where it can be found that the organizations must avoid and take advantage of.

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INTRODUCTION

The introduction of new technologies and incursion into new markets presents organizations with relevant challenges and risks that endanger their effectiveness and efficiency. Given this, methodologies aimed at dealing with problems and their risks, to prevent them and hopefully eliminate them, become that much more important. In this sense, it is useful to have scientific rigor methods that help to define actions geared towards valid and reliable results.

The close relationship between a “problem” and a “risk” can be explained as follows: A “problem” is an unwanted event in the present that may negatively impact the course of action, while a “risk” points to a possible problem in the immediate future. In this sense, Figure 1 describes risk management before developing the problem and risk management after the fact. It shows that detected risks can more easily be prevented in the future.

To address these events, two methods are commonly used by organizations: the Failure modes and effects analysis (FMEA), and the 8 Disciplines (8'D). The FMEA is characterized by being a simple yet effective procedure for the analysis of potential failures. This process uses a knowledge base to encode and classify the external and internal agents that can cause disruptions and then identifies their probability of occurrence. It also ranks inherent risks in order of importance to find out the priority of the risk and to eliminate or mitigate its impact. After the global review, treatment actions are designed (Qin, Xi & Pedrycz, 2020).

When the problem has already occurred, the 8'D methodology is adopted using a series of eight steps to solve the problem. This methodology allows experts to contextualize the occurrence and provide a temporal solution response to avoid further damage. Afterward, a cause analysis is performed that helps to propose solutions for the problem; then they are implemented and validated. This methodology focuses on identifying the origin of the adverse event based on a root cause analysis (Štofová & Szaryszová, 2017). To maximize and potentialize the two methods, this article proposes a methodological approach as a “feedback” process that capitalizes on an organization's experiences as a knowledge management system based on its members' expertise. The managed knowledge is composed of the events resolved in the past, also known as training cases. For the reuse of these cases the four stages of Case- Based Reasoning are followed (Schott, Lederer, Eigner, & Bodendorf, 2020). These stages enable organizations to solve a current problem under the reuse of the experience of similar past issues.

Background

Before citing the articles related to this manuscript, the risk and problem in this research are explained. A risk is an event in the present that will become a problem in the future; a problem is an event in the future who was at risk in the past. In other words, a problem and a risk are the same events in times of different spaces.

In a priori risk management, the Failure Mode Effect Analysis (FMEA), is for most of the world's companies, the most effective and accepted problem-solving tool, introduced in 1949 (Ng, Teh, Low and Teoh, 2017). There are four types of FMEA: system, design, process, and service. The first one is the highest-level system analysis, which is made up of various subsystems. The second one focuses on the design of the product. The third emphasizes the manufacturing or assembly process that focuses on the quality of the products manufactured. And, the fourth is responsible for analyzing the service before it reaches the customers. However, researchers as Qin et al. (2020) propose to compensate the weak-

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