# Chapter 83

# Technique for Risk Identification of Software Acquisition and Information Technologies

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## ABSTRACT

*In this chapter, the authors present the automatization of a technique for identifying the risks that may affect software acquisition projects. The proposed technique can have an impact in two software acquisition areas: 1) acquisition software contract for: Fully Developed (FD) software, Modified-Off-The-Shelf (MOTS) software, and Commercial-Off-The-Shelf (COTS) software; and 2) information technology services contract, which can be a result of using the required technological tools for the operation of any organization. In both cases, it is indispensable to manage and address (track) the risks that may affect the success of any project type mentioned above.*

## 1. INTRODUCTION

Different fields of science study the implementation of risk management. However, a large percentage of projects in the software industry are never finished or underperform before the expected time (Gibbs, 1994), (Ropponen & Lyytinen, 1997). These facts make it necessary to study project risk management.

Currently, organizations do not incur high costs to produce software that solves individual needs. On the other hand, it is increasingly common to adapt applications to meet unique requirements that are

integrated with the existing ones. Also, all types of organizations are increasingly dependent on software to execute their daily tasks. On the other hand, software is becoming more complex and the software industry has had to incorporate new technologies to keep up with a competitive market. Simultaneously, this allows to distribute data and functionality through high-speed networks and increasingly specialized devices (Jones, 1995).

The use of modern techniques and safety protocols is essential in the acquisition of Information Technologies Products and Services (IT-PS), but even with these, the software presents a high number of security failures. Additionally, the development methodologies adopted exceed budget limits and schedules established. Incorporating human beings in these activities results in failures, either through lack of safety perception, lack of skills at different stages or ignorance of a rule, among other factors. If the human component is not dealt with properly, then projects are vulnerable to large losses (Johnson, 2006).

There is a widespread belief within the software industry that an integrated software security is needed, from the earliest stages of system development, in order to ensure privacy, integrity, availability and authenticity of the products so that final products could be delivered on time and within budget.

## 2. RISK MANAGEMENT FROM THE ACQUISITION ORGANIZATION'S POINT OF VIEW

Currently, organizations have increased their capacity of IT-PS acquisition, and few continue to develop software in-house. This phenomenon occurs for various reasons, such as:

1.  Increased demand for IT-PS in organizations
2.  High costs of maintaining development teams with technical skills than can support Information Technology (IT) demand.
3.  Increasing number of competitive organizations with high technical capabilities for developing Information Technology (IT).

Therefore, organizations nowadays adopt IT-PS acquisition as a business strategy to improve operational efficiency. This is accomplished using the suppliers' capabilities to offer quality solutions quickly, at a lower cost and with the most appropriate technology (Software Engineering Institute, 2010).

### 2.1 Types of IT-PS Acquisition Projects

The different types of acquisition projects can be classified under various criteria. For example: (i) depending on the type of development team (inside or outside the organization) (Nelson, 1996); (ii) depending on the type of product being acquired (IEEE, 1998); (iii) depending on the function of the existing relation between the development team and the end user (Baker & Fisher, 2007); (iv) depending on the type of work to be performed by the external organization ("Extreme Chaos," 2001).

A classification of different types of acquisition projects that include software acquisition projects patterns is summarized as follows (Vega Zepeda, Gasca-Hurtado, Calvo-Manzano, 2012):

1.  **Acquisition of fully developed software, developed using traditional methodologies:** Acquiring a fully developed software allows the customer to control and participate in the software development

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