Chapter 17
COTS Software Procurement Methodology

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ABSTRACT
Two of the most important COTS software acquisition processes are the COTS software solution evaluation and selection process and the COTS software solution contract management process. This chapter presents a new methodology to deal with these two phases in detail. The evaluation and selection part consists of 12 steps divided over four phases. The contract management part consists of nine steps divided over four phases. The authors explain each of the two parts of the methodology by describing each of the 21 steps. This research presents a solution to the difficult problems facing the vendors, users, and experts involved in COTS software evaluation, selection, and acquisition and guides them systematically to make the best educated decision. To the authors’ knowledge, this work presents the first integrated solution to the software evaluation, selection, and acquisition processes of COTS software. The research is based on real experience obtained from the analysis of three case studies of major COTS software acquisition projects in Bahrain. This chapter is a step forward in the continuous research of COTS software acquisition and procurement processes.

INTRODUCTION
Commercial off-the-shelf (COTS) software has been widely used by organizations to develop information systems (IS) instead of traditional in-house development (Al-A’ali, Al-Mahmood, & Al-Zobaidie, 2006). COTS software is supposed to contribute to the development of IS in a shorter period with lower costs and lower risks and is supposed to take advantage of the best technologies available in the market that enhance the functionalities and capabilities of the system. COTS can be made available in multiple identical copies and used without internal modification by the consumer (Meyers & Oberndorf, 2001).
The process of COTS software acquisition using a defined formal supplier management process has been a major research issue (Tayntor, 2006). Heckman (1999) studied how organizations manage and organize their relationships with IT suppliers. Heckman (1999) discussed three issues: the degree of formalization of IT supplier-management practices, the extent of discretionary collaborative behavior (DCB) on the part of information technology customers, and the relationship between formalization, DCB, and perceived effectiveness in influencing supplier performance. In addition, Yardley (2002) described the process of COTS procurement and contracting in three stages: precontract, invocation (signature), and during the contract. The precontract stage is the process of inviting IT suppliers or service providers to bid for work through mechanisms such as an invitation to tender (ITT) or a request for proposal (RFP). The contracting process is vital in dealing with external suppliers, and its content is the key to monitoring the suppliers’ work (Meyers & Oberndorf, 2001).

The software selection process is another critical area covered by Assmann and Punter (2004); they presented a method for assessing software subcontractor process (MASS), which consists of preselect, prepare RFP, prepare response, and evaluate proposals.

Another aspect in COTS software acquisition is the participation of an external party (Rawashdeh & Matalkah, 2006). Yardley (2002) discussed the supplier-customer relationship communication methods between the two parties in the case where the customers are dissatisfied with the suppliers’ performance. Lander, Purvis, McCray, and Leigh (2003) explored the mechanisms and strategies for building trust between project team members, users, and outsourcers in outsourced IS development projects. Although these areas are not directly related to this research, they are considered critical in the COTS software acquisition field.

The COTS software life cycle is different from the traditional software life cycle, in which the COTS life cycle introduces new processes that do not exist in the traditional life cycle, but at the same time both share some common processes. The communication phase, the project initiation phase, the requirements gathering phase, the planning phase, and the deployment phase are common in both life cycles. However, the differences are clear in the modeling and construction phases as the developer need not perform analysis, design, and coding activities (Pressman, 2005).

Software requirements are the first order of business and take place before design, cost estimation, planning, or programming. Certain straightforward criteria require satisfaction: completeness, consistency, traceability, and testability (Boehm, 2000; Boehm, Maiden, & Moore, 2004). The most significant problem with the airtight-requirements approach was its attempt to be a one-size-fits-all solution. Although this tactic fails most COTS and rapid change situations, the airtight-requirements approach proves valuable in many situations (Boehm, 2000).

The objectives of this chapter are as follows:

1. Investigate the literature for issues pertaining to the COTS software evaluation and selection process.
2. Investigate the literature for the COTS procurement and contract management process.
3. Present a new integrated methodology to deal with these two major processes in detail.
4. Develop a methodology to present a solution to the difficult problems facing the vendors, users, and experts involved in COTS software evaluation, selection, and acquisition and guide them systematically to make the best educated decision.

**BACKGROUND**

The critical elements of software development projects and the agreements that underpin them is a major issue (Comela-Dorda, 2002; Murphy,