



## **Chapter XVI**

# **Teaching ERP Programming Using SAP ABAP/4**

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### **ABSTRACT**

*In this chapter, a teaching pedagogy for ERP programming using SAP ABAP/4 is presented. While object-oriented (OO) programming techniques have received increasing attention in new ERP module development, learning and mastering of traditional ABAP/4 code will continue to play an important role especially in maintaining SAP R/3 systems for necessary extensions that are required to meet end-user needs of SAP adopters. The pedagogy presented is essentially a three-threaded teaching approach that involves a stepwise learning of ABAP/4, selective hands-on investigation of SAP R/3 modules, and an accumulative simulation of a simplified R/3 module. A simple ABAP/4 program is also presented to highlight how an online report could be easily generated through using both internal tables and the sample database (flight) available in SAP R/3. Limitations, suggestions, and future trend of ABAP/4 application development are also addressed with a concluding remark.*

## INTRODUCTION

SAP is the world's leading provider of ERP software solutions. Today, more than 18,000 companies in over 120 countries run more than 50,000 installations of SAP R/3 software (Hewlett-Packard, 2002). Noticeably, SAP is offering Business-One and mySAP All-in-One solutions to meet enterprise information needs from small to median to large corporations over the whole world (SAP, 2005). While SAP R/3 has the capacity in providing full information processing for companies of different sizes, it is of course not a *one-size-fits-all* solution package that can be put into use without necessary configuration and/or customizations, which often involve undesirable code modifications, addition of client-specific business functional extensions, and separate development of business modules. Hence, knowing the programming fundamentals of R/3 systems becomes important for prospective SAP adopters.

ABAP/4 is a fourth-generation application programming language and ABAP, an acronym of *advanced business application programming*. Though today more and more new R/3 modules are coded using ABAP Objects (Keller and Kruger, 2002), any customizations to existing modules cannot be conducted without a good knowledge in or even using ABAP/4. It is for this very reason this chapter is dedicated to teaching methodologies that are effective for CIS/MIS majors or IT professionals to develop ABAP/4 skills in managing or maintaining R/3 systems. As common to most programming languages, ABAP/4 evolved from a third-generation "procedural" language to a fourth-generation non-procedural one that embeds SQL statements to retrieve data from remote relational database servers. However, when compared to others, the uniqueness of ABAP/4 is its client-side programming capability along with team-shared features. That is, an ABAP/4 programmer only needs Internet access to a SAP developer server with a developer's privilege, then he/she can work from anywhere to conduct coding and share developed modules with other programmers on the same development environment. Furthermore, much of the programming knowledge (e.g., examples, syntaxes, etc.) can be acquired easily over the Internet by visiting free Web sites offered by many ABAP/4 consulting professionals or searching the help facility provided by SAP — <http://help.sap.com>. Therefore, ABAP/4 programming could be made possible by a simple setting — a client-side interface and a developer account that allows access to the ABAP workbench on a SAP server.

Since the set-up of ABAP/4 programming environment is relatively straightforward, this chapter is primarily focused on the teaching pedagogy for a one semester course designed for students with minimal programming knowledge in any third-generation languages (e.g., FORTRAN, COBOL, etc.). The goal of this course is to develop students' skills in ABAP/4 programming and knowledge in appropriate customizations for an existing R/3. The remaining of this chapter is organized as follows: First, a brief background is given to highlight the importance of learning ABAP/4. Second, three different levels of customizations for R/3 are addressed, followed by a teaching pedagogy fulfilled by a three-threaded teaching approach. Teaching subjects, take-home assignments, and a semester long-term project are proposed to simulate the development of a scale-down ERP module. Challenging issues and potential extensions are discussed. Finally, concluding remark is given in the end.

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