

## Chapter 1.6

# Integrated Research and Training in Enterprise Information Systems

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### ABSTRACT

The success of implementing Enterprise Information System (EIS) depends on exploring and improving the EIS software, and EIS software training. However, the synthesis of the EIS implementation approach has not been investigated. In this chapter, the authors propose an integrated research and training approach for students and employees about enterprise information systems (EIS) that are encountered in an organization. Our integrated approach follows the different stages of a typical EIS project from inception to completion. These stages, as identified, are modeling, planning, simulation, transaction, integration, and control. This ensures that an employee who

is trained by this plan has an acquaintance with the typical information systems in an organization. Further, for training and research purposes the authors developed prototype information systems that emulate the ones usually found in organizations. This ensures the EIS software logic is consistent with the business logic. This chapter also discusses some of the case studies conducted with the prototype systems.

### INTRODUCTION

Enterprise Information Systems (EIS) constitute the spectrum of information technology solutions used by an organization and influence nearly all aspects of operations of an organization. Typical

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EIS systems such as Enterprise Resource Planning (ERP), Customer and Supplier Relationship Management (CRM and SRM), and Manufacturing Execution Systems (MES). It is widely accepted that EIS deliver great rewards, but the risks these systems carry are equally important. If an organization rolls out an EIS without analyzing the business implications, the logic of the system may conflict with the logic of the business (Subramanian & Hoffer, 2005). This may result in failure of implementation, wasting vast sums of money, and weakening important sources of organization's competitive advantage.

Prior research has investigated and identified the critical factors that influence the successful implementation of EIS. Education and training of employees on EIS is one of the most widely recognized factors (Umble & Haft, 2003) (H. Hutchins, 1998; Ptak & Schragenheim, 2000) (Laughlin, 1999). EIS implementation requires the knowledge of the employees to smoothly carry on the business process and further solve problems that arise from the new system. Even with good technical assistance, the complete potential of EIS cannot be realized without employees having an appreciation of the capabilities and limitations of the system (Somers & Nelson, 2001). To make the employee training successful, it is agreed that it should start early, preferably well before the rollout of EIS begins. The upper management in large manufacturing enterprises often underestimate the level of education and training necessary to implement EIS and as well as its associated costs. It has been suggested that reserving 10–15% of the total EIS implementation budget is a good practice to ensure the employees receive enough training (McCaskey & D. Okrent, 1999) (Umble & Haft, 2003). With the estimated budgets for implementing EIS in billions of dollars the cost of training the employees on these systems is a very sizeable portion (Hong & Kim, 2002). These costs can be brought down if the employees have a prior education and training on EIS. Hence, at the Center for Manufacturing and Enterprise Integra-

tion (CMEI) at the Penn State University focuses on training students and working professional in EIS and related enterprise integration issues. Further, as part of research at CMEI, projects are undertaken to study the information system infrastructure for planning in Small Manufacturing Enterprise (SME). These projects were aimed at improving the operations management for SMEs with the help of Information Technology (IT). We found many avenues for improvement both in operations management and information systems, but there were barriers in implementing such projects. These barriers vary from capital and complexity of the systems to human inertia to change. But the key barrier we noticed among SMEs is the lack of tools or expertise for handling the EIS software. Most of the EIS software available requires extensive training for its use and maintenance. SMEs cannot afford this training as it involves hiring specialized engineers and consultants. Based on our experience with SMEs and to reduce training costs for EIS deployment in large manufacturing enterprises, we developed a rollout plan which encompasses the different settings in an organization that employees use EIS. The important stages that we identified are the Modeling, Planning, Simulation, Integration, Execution and Control. We developed prototype software for each stage that emulates the functionalities of typical organizational software. In the following sections, we present an overall view of our rollout plan and then elaborate on the individual stages. In this work, our focus has been mostly centered on information systems that are typical in manufacturing organizations, but it can be readily extend to other industry segments.

## **ROLLOUT PLAN FOR TRAINING IN ENTERPRISE INFORMATION SYSTEMS**

The rollout plan developed for training in EIS was modeled to follow the different stages that a new

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