Capability Maturity Model and SAP:
Toward a Universal ERP Implementation Model

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ABSTRACT

AcceleratedSAP is a methodology developed for cost-effective SAP R/3 installation. Numerous project managers have adopted AcceleratedSAP for SAP implementation in a range of industries around the world. The Capability Maturity Model (CMM) is, similarly, a software model that improves software processes in software organizations so that software projects run successfully and deliver quality products. AcceleratedSAP and CMM were developed independently with completely different objectives but share two important characteristics: good engineering and good management practices. Given the high failure rates in software projects, organizations have adopted well-established software models, such as AcceleratedSAP and CMM. This paper describes how AcceleratedSAP and CMM can be aligned in terms of software project management practices. By combining their unique features, ERP managers can easily adopt CMM for ERP installations so that the advantages that can be realized through CMM KPAs (Key Process Areas), and can be exploited for business process re-engineering.

Keywords: AcceleratedSAP; Business Process Re-engineering; Capability Maturity Model (CMM); Enterprise Resource Planning (ERP); SAP R/3; Software Development

INTRODUCTION

Future prospects of many companies will be determined by their ability to overcome the challenges associated with globalization and external market competition. One popular response to these challenges can be found in the concept of business process re-engineering (BPR). BPR involves not only processes of re-engineering but also best business practices, process transformation, optimization, downsizing, rightsizing, and continuous im-provement. In all these endeavors, an integrated enterprise resource planning (ERP) system is regarded as indispensable. Koch (2001) reports that an ERP installation supports radical BPR, while Chen (2001) reports that continuous improvement with ERP-enabled processes has been described as rewarding and promising.

Among ERP vendors, SAP has established itself globally as the dominant supplier of core business systems. With more than 15,000 installations worldwide, SAP has been

adopted by many multinational corporations as their global standard, and an increasing number of smaller enterprises are following suit (Deimel, 1998). An SAP project is typically complex and costly, affecting the whole organization. For example, in order for an SAP system to be aligned (or customized) to the specific requirements of an enterprise, business processes need to be re-engineered and internal resources allocated. This is not merely time-consuming. When an SAP project overruns, or its schedule slips, unexpected project costs can be severe. Unexpected delays in BPR can also lead to lost business opportunities. Thus, the success of an ERP project could be roughly justified in terms of three factors: time, budget control, and functionality implementation.

One study has shown that 40% of all ERP projects are only partially completed and 20% are discarded as total failures (Escalle & Cotteleer, 1999; Grant, 2002); another reported that 60% of ERP projects failed to achieve the expected (or required) return on investment (Ptak & Schragenheim, 1999). Taking this into account, along with the fact that conventionally SAP implementation involves third-party consultants (e.g., an authorized dealer or business partners), SAP must ensure that no matter who the partners are, every implementation of an SAP product (e.g., SAP R/3) satisfies the three criteria of time, budget control, and functionality implementation. To do this, SAP developed AcceleratedSAP (ASAP), which provides a roadmap for cost-effective SAP R/3 implementation (Hiquet & Kelly, 1998; Krumboholz & Maiden, 2001; Stewart, 1998; Welti, 1999).

AcceleratedSAP describes a framework of tasks that seeks to avoid potential pitfalls that may be encountered in the life cycle of an SAP project. It was also intended for use in managing business process re-engineering. Since ERP projects that include SAP R/3 installations are software projects, one objective of our work is to investigate the merits of adopting software process models, such as the Capability Maturity Model (CMM) (Paulk et al, 1995), in ERP implementation. It is expected that this will provide insights into the establishment of a sound universal implementation model for other ERP packages (e.g., Oracle, Peoplesoft, JD Edwards, Baan).

This paper proposes a software process model for ERP implementation based on AcceleratedSAP and CMM, hence called AcceleratedCMM (ACMM). CMM is a disciplined software model in which a number of key process areas (KPAs) have been identified as central determiners of the process capability of a software organization. These KPAs are prioritized into different levels so that they provide an organization with a path of growth through which it is possible to enhance software process capabilities. CMM is usually adopted for large-scale software projects, but, in principle and properly interpreted, it is suitable for diverse environments (Johnson & Brodman, 2000).

In the past, CMM has been used to assess and appraise software organizations for their capability level and for their CMM certification. Our proposed model, AcceleratedCMM, differs from this in that it is a product obtained from using CMM to assess and appraise the ERP implementation model (i.e., AcceleratedSAP). The results of the AcceleratedCMM assessment identify key process areas in which an ERP implementation can be carried out more effectively.

The potential impacts of AcceleratedCMM are financial, theoretical, and industrial. In dollar terms, the ERP market was worth $15.68 billion in 1997, growing to $72.63 billion in 2002. The associated ERP consultancy market, which provides ERP project services, has also grown substantially (Holland & Light, 1999). Given this, the use of a universal ERP methodology in ERP implementation and assessment promises considerable advantages in cost-efficiency, especially in the context of the recent trend towards open source ERP and CRM. ComPiere Inc, for example, has distributed its ERP/CRM package, called Compiere, along with its source code (Compiere, 2000) and now has more than 660,000 downloads. Instead of selling ERP, the company and its different local business partners aim to provide BPR solutions, Integration, ERP training, and imple-

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