Chapter 66

Reengineering of Legacy Systems into Supply Chain Systems:
Traditional Data Oriented versus Process Oriented Approaches

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ABSTRACT

The paper presents data oriented and process oriented models of legacy systems. It discusses the details of systems development and evolution models mainly aiming at an ongoing reengineering of legacy systems into supply chain systems. It proposes few strategies for reengineering of both data oriented model and process oriented models. The legacy systems often miss automatic interfaces to supply chain systems, so the article presents a strategy focusing on automatic update of data of the system. Likewise, the article also presents a strategy for process reengineering in order to integrate these legacy systems into supply chain systems. Finally, a legacy system is envisioned as a comprehensive mix of both data and process oriented, while proposing a gradual ongoing reengineering of both data structures and process methods.

1. INTRODUCTION

A legacy system is an application that uses an outdated hardware or software platform. Due to the fact that a legacy system is very old, it is hard to find the skill set for maintaining the software or replacing hardware parts if a software bug is encountered or a hardware failure occurs. Recent trend is the shortening life period of systems to adapt to the new systems quickly; several systems are becoming outdated

too soon and joining the group of legacy systems. The huge investment in a legacy system often compels reengineering and reuse of the system for evolution, maintenance and adaptation to component based software models and newer hardware platforms. Therefore, legacy systems range from traditional systems to recent component-based systems. The same modeling techniques that were used during legacy systems development also serve as building blocks during reengineering phase. This article presents both traditional and component-based modeling techniques and proposes few reengineering approaches that would prolong the life span of a legacy system that uses either of the modeling techniques.

The systems documentation includes models that describe the requirements collected during system analysis stage of software development process (Jacobson, I., Christerson, M., Jonsson, P. & Overgaard, G., 1993). These models simplify the system complexity and help software maintenance team to quickly understand what was done and aid in software maintenance or enhancement (Satzinger, J.W., Jackson R.B., and Burd S.D., 2002). These requirement models for a system are often remodelled during system architecture based on the methodology chosen. This article focuses on traditional data and process models and attempts to propose reengineering of such systems.

The traditional data oriented reengineering focuses on migrating databases of legacy systems to contemporary relational databases, enterprise data standardization, integration of disparate information systems, data quality assurance, etc. (Alice H. Muntz, and Christian T. Ramiller, 1994). The data oriented reengineering can also be conducted in a simplified manner by focusing on improving aspects of data one by one in a more practical manner as presented in this article. This approach eliminates the possibility of system failures, or minimizes the impact on overall system while reengineering the system as needed. On the other hand, the process oriented reengineering takes into account a sequence of work activities and remodels them in an attempt to revamp a part of the legacy system. Supply chain systems puts emphasis on the sharing resources and integration of information systems between the participating entities in the supply chain, integration of supply chains involve information sharing practices such as vendor-managed inventory (VMI) that give manufacturers access to more accurate demand information (Valverde & Saade 2015). The effort could be as simple as extending the legacy system to a supply chain system as proposed in this article.

2. SUPPLY CHAIN SYSTEMS

The internet and information technology have important effects in the modern chain management. The most import according to Simchi-Levi et al., (2003) objectives of IT in Supply Change Management are:

- Providing information availability and visibility;
- Enabling single point of contact of data;
- Allowing decisions based on total supply chain information;
- Enabling collaboration with supply chain partners.

Information Technology has been recognized as an important strategic driver for Supply Chain Management. Bowersox and Daugherty (1995) outlined that IT is key in supporting companies creating strategic advantage by enabling centralized strategic planning with day-to-day centralized operations. A common view held is that IT has a profound impact on managing supply chains. Using case studies in six Finnish industrial supply chains as data, Kemppainen and Vepsäläinen (2003) argue that IT is,

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