Available online at www.sciencedirect.com
ScienceDirect
Journal of Operations Management 25 (2007) 357–363
JOURNAL OF OPERATIONS MANAGEMENT
www.elsevier.com/locate/jom

Enterprise resource planning (ERP)—A brief history

F. Robert Jacobs [a,*], F.C. 'Ted' Weston Jr.[b]

[a] *Kelley School of Business, Indiana University, Bloomington, IN 47405-1701, United States*
[b] *College of Business, Colorado State University, Fort Collins, CO 80523-1277, United States*

Available online 12 December 2006

Abstract

This is a brief history of ERP—enterprise resource planning. Major ERP vendors are discussed as well as the major impact of developments in computer hardware and software on the industry. The industry consolidation that has recently occurred is also discussed. Interviews were conducted with Mr. Ed McVaney, founder of J.D. Edwards, Rick Allen, former VP of Finance and Administration, and Rick Snow, former Chief Legal Counsel of J.D. Edwards. Information was also obtained from Bill Robinson who held the position of ''Industry Consultant'' with IBM in the mid-1980s.

Keywords: ERP; Industry; Functional enterprise; Data integration

The move beyond MRP that occurred in the late 1970s and early 1980s was driven by a need for stronger integration between the functional enterprise silos that dominated firms throughout this period. One could argue that software engineers recognized the promise of data integration very early—long before the push towards flatter organizational structures that occurred in the early 1990s.

The Eleventh Edition of the *APICS Dictionary* (Blackstone and Cox, 2005) defines ERP (enterprise resource planning) as a ''framework for organizing, defining, and standardizing the business processes necessary to effectively plan and control an organization so the organization can use its internal knowledge to seek external advantage'' (page 38). This definition highlights the broad scope of applications that fit under the ERP framework. Manufacturing planning and control (MPC) systems are our primary focus but the full system is intended to serve business processes housed within other functional areas—finance and accounting, human resources, payroll, and sales/marketing, etc.

Here we offer a brief history of enterprise resource planning, showing its relationship with its predecessors MRP and MRP II. Our data comes from a number of sources, including our own recall. Major input is from an interview with one of the founding fathers of ERP, Ed McVaney, a founder and former Chairman and CEO of the J.D. Edwards Company. Additional interviews were conducted with Rick Allen, former Executive Vice President of Finance and Administration and Rick Snow, former Chief Legal Counsel, both from J.D. Edwards. Further information was provided by Bill Robinson, a retired IBM executive who held the prestigious position of ''Industry Consultant'' in the mid-1980s.

For completeness, our chronology will begin in the 1960s, an era that is also covered by Mabert in his article in this issue. We move quickly through this period and take the chronology through the important developments up to the present.

* Corresponding author.
E-mail address: jacobs@indiana.edu (F. Robert Jacobs).

0272-6963/$ – see front matter
doi:10.1016/j.jom.2006.11.005

1. The 1960s—early computers, reorder point (ROP) systems and early material requirements planning (MRP)

In the 1960s the primary competitive thrust was cost, which resulted in product-focused manufacturing strategies based on high-volume production, cost minimization, and assuming stable economic conditions. The introduction of newly computerized reorder point (ROP) systems – including economic order quantity and economic reorder point – satisfied basic manufacturing planning and control (MPC) needs of these firms.

MRP – the predecessor to and backbone of MRP II and ERP – was born in the late 1960s through a joint effort between J.I. Case, a manufacturer of tractors and other construction machinery, in partnership with IBM. At the time, this early MRP application software was the state-of-the-art method for planning and scheduling materials for complex manufactured products. Earlier versions of computerized MPC systems (for example, IBM's "PICS" – production and inventory control system) had used the only large-scale storage medium available – magnetic tape. Inventory item master files were kept on tapes, transaction tapes were built during the week, and "passing the tapes" created a new master tape plus lists of orders based on calculated order quantities, safety stocks and on hand balances. (Economic order quantities were calculated by hand using slide rules and entered into the system: first and early second generation computers were not capable of calculating square roots.)

Tape is a one-dimensional medium: manufacturing is (at the least) a two-dimensional business. Projecting requirements of components over future time buckets is a two-dimensional problem; exploding down through a bill of material is a two-dimensional exercise. There were some small shops with very shallow bills of materials, which had schemes for exploding requirements using multiple passes through card sorters. These were rare and, typically, completely dependent on one person who had mastered a technique for this particular data processing art. It was the availability of random access memory that changed the game and made MRP possible.

2. The 1970s—MRP and computer hardware and software developments

Initial MRP solutions were big, clumsy and expensive. They required a large technical staff to support the mainframe computers—at first the IBM7094, for example, and later IBM's 360s and 370s. The development of ever faster and higher capacity disk (random access) storage was a major enabling technology for the development of more integrated business information systems. The word "database" was not in the vocabulary and software tools were highly limited by modern standards.

In the late 1970s the primary competitive thrust was shifting towards marketing, which resulted in the adoption of target-market strategies with an emphasis on greater production integration and planning. MRP systems fit that requirement nicely because of the integration between forecasting, master scheduling, procurement, plus shop floor control. MRP fairly quickly became established as the fundamental parts and materials planning concept used in production management and control.

This era also saw the introduction of IBM's COPICS (communications oriented production information and control system), an eight-volume 1972 series with the objective of providing "... a series of concepts that outline an approach to an integrated computer-based manufacturing control system" (COPICS, 1972). The COPICS software was designed to run on the IBM Model 360 mainframe computer. The movement towards what would be called MRP II – manufacturing resource planning – was underway.

The mid-1970s saw the birth of major software companies that would later become key ERP vendors. In 1972 five engineers in Mannheim, Germany, started up SAP (Systemanalyse und Programmentwicklung). The purpose of the company was to produce and market standard software for integrated business solutions. Lawson Software was founded in 1975 when Richard Lawson, Bill Lawson, and business partner John Cerullo saw the need for pre-packaged enterprise technology solutions as an alternative to customized business software applications. J.D. Edwards (founded by Jack Thompson, Dan Gregory and Ed McVaney) and Oracle Corporation (by Larry Ellison) were established in 1977. Oracle offered the first commercial SQL (Structured Query Language) relational database management system in 1979. In 1978 Jan Baan began The Baan Corporation in the Netherlands to provide financial and administrative consulting services.

Orlicky's (1975) *Material Requirements* text was the first completely detailed description of MRP logic as well as such necessities as low-level coding. It was intended for a wider audience than were the technical manuals which accompanied the purchase of one or another system – hardware or software. Substantial segments of this book were required to explain what