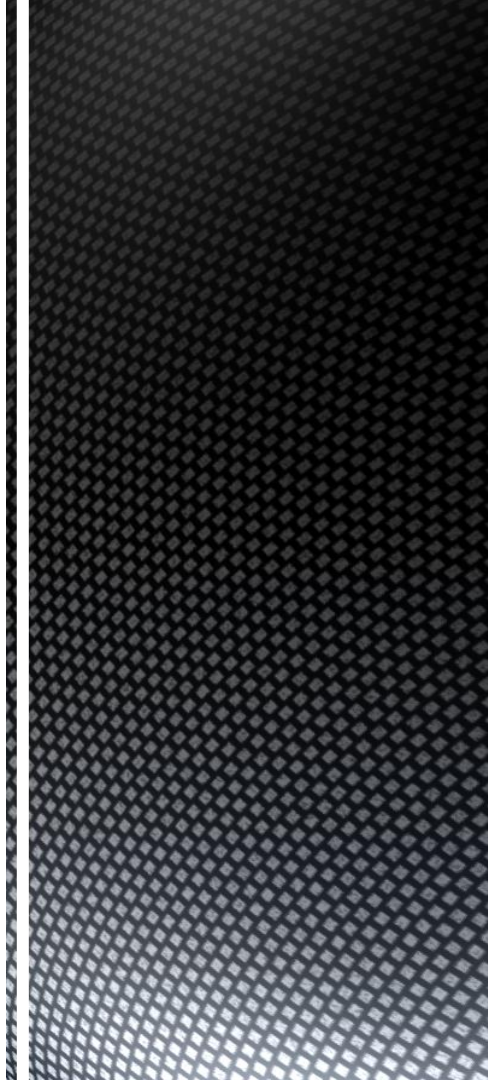


ERP (21-550)

*Advanced Manufacturing Laboratory
Department of Industrial Engineering
Sharif University of Technology*

Session #2



Course Description

■ *Instructor*

- *Omid Fatahi Valilai, Ph.D. Industrial Engineering Department, Sharif University of Technology*
- *Email: FValilai@sharif.edu , Tel: 6616-5706*
- *Website: Sharif.edu/~fyalilai*

■ *Class time*

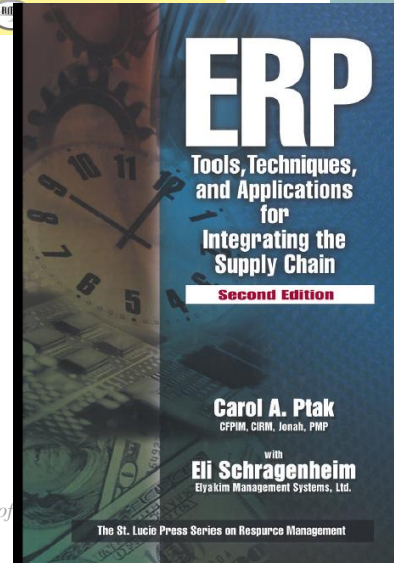
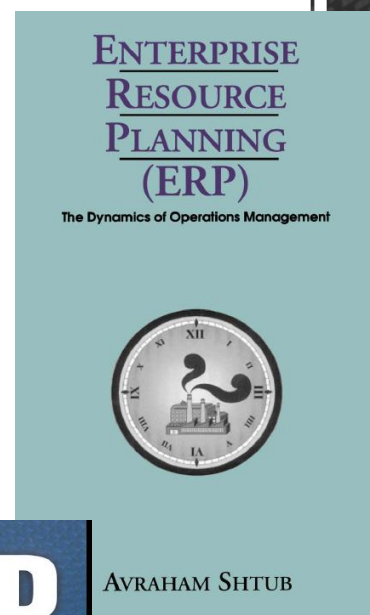
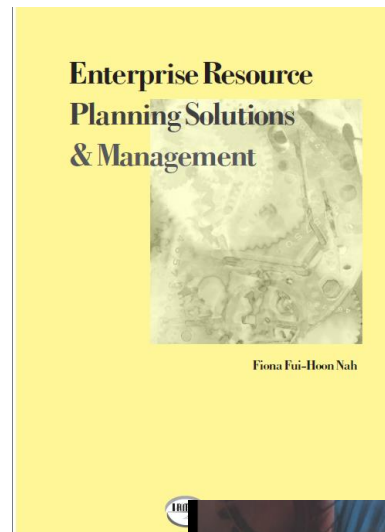
- *Sunday-Tuesday* *16:30-18:30*
- *Wednesday* *09:00-12:00*

■ *Course evaluation*

- *Mid-term* *(30%)*
- *Final exam* *(40%)*
- *Quiz* *(5%)*
- *Exercise* *(10%)*
- *ERP Lab* *(15%)*

Course Description (Continued ...)

- *Mid-term session:*
 - *Sunday : 8th Azar 1394, 16:30 ~ 18:00*
- *Final Exam:*
 - *Sunday: 27th Dey 1394, 09:00 ~ 10:30*
- *Reference:*
 - *Shtub, A., “Enterprise Resource Planning (ERP)- The dynamics of operations management”, 2002, Kluwer Academic Publishers*
 - *Ptak, Carol A., “ERP Tools, Techniques, and Applications for Integrating the Supply Chain”, 2004, The CRC Press*
 - *Fui, F., Nah, H., “Enterprise Resource Planning”, 2002, IRM Press*

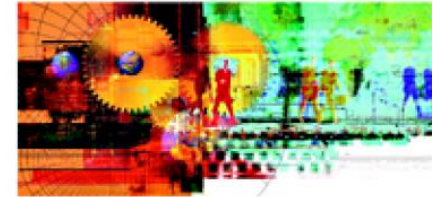


Course Description (Continued ...)

- *Mid-term session:*
 - *Sunday : 8th Azar 1394, 16:30 ~ 18:00*
- *Final Exam:*
 - *Sunday: 27th Dey 1394, 09:00 ~ 10:30*
- *Reference:*
 - *Daniel E. O'leary, "Enterprise Resource Planning Systems Systems, Life Cycle, Electronic Commerce, and Risk", 2000, Cambridge University Press*

Enterprise Resource Planning Systems

Systems, Life Cycle,
Electronic Commerce, and Risk



Daniel E. O'Leary

CAMBRIDGE www.cambridge.org/978052179152

Course Description (Continued..)

- *Contents:*
 - *Enterprise Management*
 - *Operations Management*
 - *The Evolution of ERP Systems: A Historical*
 - *Organizations and organizational structures*
 - *Scheduling*
 - *Purchasing and inventory management*
 - *Marketing considerations*
 - *ERP selection and implementation*

Course Description (Continued..)

- *Contents:*
 - *Enterprise Management*
 - *History of Enterprise Resource Planning*
 - *The Theory of Constraints and ERP*
 - *Sales and Operations Planning*
 - *Buffer Resource Strategy*
 - *Enterprise Resource Management*
 - *Integrating the Supply Chain to Reap the Rewards*
 - *Strategic Sourcing and Procurement*

Course Description (Continued..)

- *Contents:*

- *Enterprise Management*

- *History of Enterprise Resource Planning*

- *Just some times ago:*

- *Simple manual approaches such as order point were effective in managing inventory.*

- *Companies could afford to keep inventory on hand to satisfy customer demand.*

- *Labor was the main driver of product cost.*

- *The focus was based on longer product life cycles and less product variety.*

- *The normal policy in purchasing was to keep a little of everything on order all the time just to make sure that it never ran out.*

- *The assumption was that the customer would continue to order what they had before and the future would look very much like the past.*

Enterprise Management

- *Contents:*

- *History of Enterprise Resource Planning*

- *Just some times ago:*

- *Product life cycles were measured in years.*

- *If a little extra was ordered, it was not a big issue since it could be used up before it became obsolete.*

- *Inventory was an asset not only on the balance sheet, but also in the mind of the average manufacturing manager.*

- *Warehouses, automated storage/retrieval systems, and carousel systems were designed, developed, and installed to manage, sort, and retrieve inventory.*

- *The techniques of the day focused on the most efficient manner of managing large volumes of inventory.*

Enterprise Management

- *Contents:*

- *History of Enterprise Resource Planning*

- *Material Requirement Planning:*

- *The need to order only what was really needed crept in on the horizon.*

- *No longer could a company afford to order some of everything and keep a little of everything on hand.*

- *Orders had to be based on what was being sold.*

- *Excess and obsolete inventory became a real problem.*

Enterprise Management

- *Contents:*
 - *History of Enterprise Resource Planning*

IIE Transactions (1998) **30**, 705–713

Make-to-order versus make-to-stock in a production–inventory system with general production times

ANTONIO ARREOLA-RISA¹ and GREGORY A. DeCROIX²

¹*Department of Information & Operations Management, Lowry Mays College & Graduate School of Business,
Texas A&M University, College Station, Texas 77843-4217, USA*

E-mail: Tarreola@tamu.edu

²*Fuqua School of Business, Duke University, Durham, NC 27708-0120, USA*

E-mail: decroix@mail.duke.edu

Enterprise Management

- *Contents:*

- *History of Enterprise Resource Planning*

- *Material Requirement Planning:*

- *For the first time, based on a schedule of what was going to be produced and supported by a list of materials that were needed for finished item, the computer could calculate the total need and compare it to what was already on hand or committed to arrive.*

- *This comparison could suggest an activity to place an order, cancel orders that were already placed, or simply move the timing of these existing orders.*

- *MRP calculates what do I need, compares it to what do I have and calculates what do I need to go get and when.”*

Enterprise Management

- *Contents:*

- *History of Enterprise Resource Planning*

- *Material Requirement Planning:*

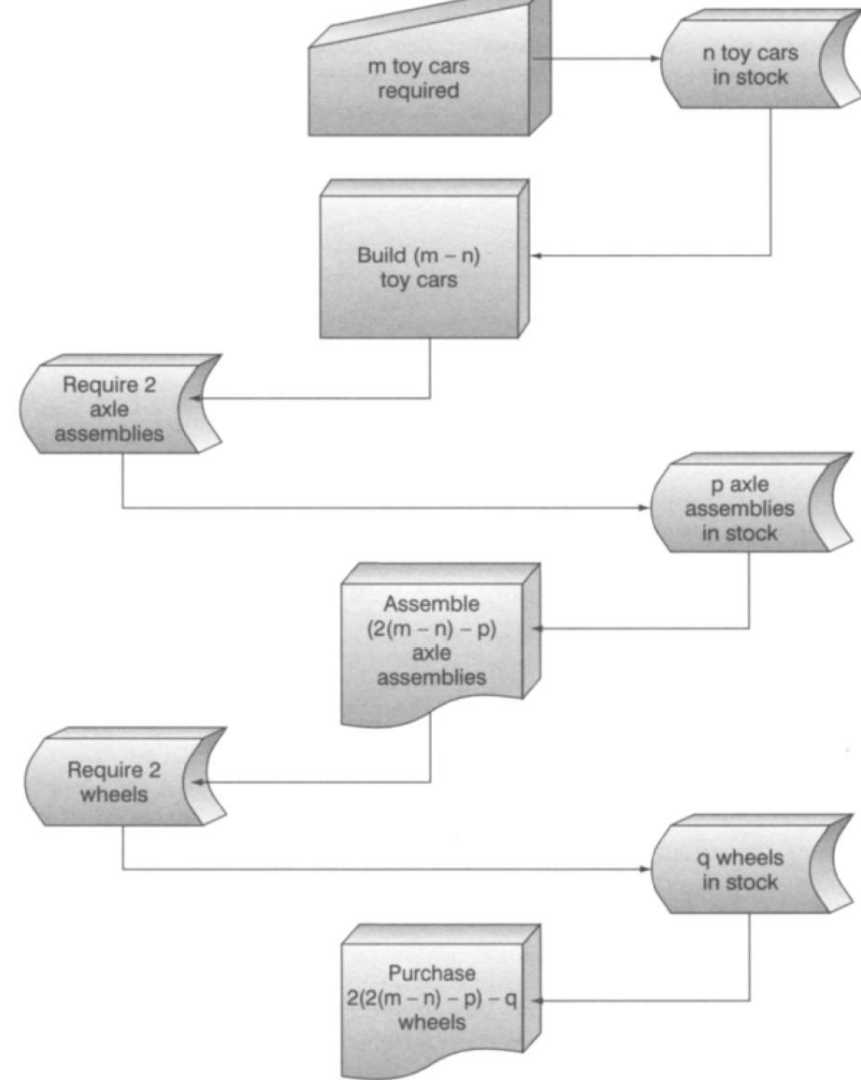
- *For the first time the material planning function could answer the question of when. Rather than being reactive and waiting until the shortage occurred.*

- *The planner could be proactive and time phase orders, including releasing orders with multiple deliveries.*

- *These larger orders with multiple delivery dates typically can provide a significant cost advantage for the company because of favorable vendor pricing.*

Enterprise Management

- MRP netting



- *Contents:*

- *History of Enterprise Resource Planning*

- *Material Requirement Planning:* **Integer Linear Programming Formulation of the Material Requirements Planning Problem**

R. KARNI¹

Communicated by M. Avriel

Abstract. Lot sizing procedures for discrete and dynamic demand form a distinct class of inventory control problems, usually referred to as *material requirements planning*. A general integer programming formulation is presented, covering an extensive range of problems: single-item, multi-item, and multi-level optimization; conditions on lot sizes and time phasing; conditions on storage and production capacities; and changes in production and storage costs per unit. The formulation serves as a uniform framework for presenting a problem and a starting point for developing and evaluating heuristic and tailor-made optimum-seeking techniques.

Enterprise Management

- *Contents:*

- *History of Enterprise Resource Planning*

- *Material Requirement Planning:*

- *Some simplifying assumptions*

- *One of these assumptions was that orders should be started at the last possible date to provide for minimal inventory while still serving the customer's need on time. (backward scheduling)*

- *All orders were scheduled backwards from the desired completion date to calculate the required start date.*

- *In project management language, all operations were placed on the critical path.*

- *Earliest date the operation could start was the same as the latest date the operation could start.*

- *There was no slack time in the schedule.*

Enterprise Management

- *Contents:*

- *History of Enterprise Resource Planning*

- *Material Requirement Planning:*

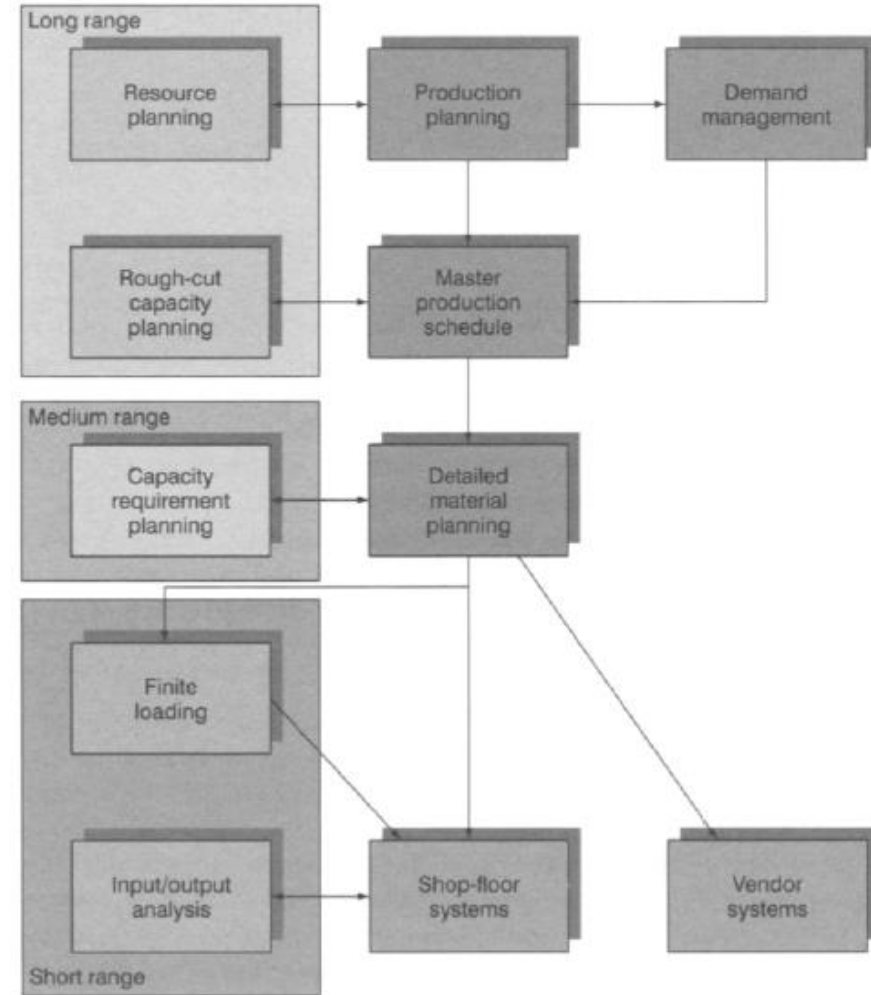
- *Companies were able to gain control over their material purchases and order only what was needed and when.*
 - *Productivity and quality significantly improved in the companies.*
 - *The inventory asset was significantly reduced and cash flow dramatically improved as a result.*
 - *This provided a tremendous competitive advantage to those companies effectively using these new tools.*

Enterprise Management

- *Contents:*
 - *History of Enterprise Resource Planning*
 - *Material Requirement Planning:*
 - *Closing the MRP loop*

Enterprise Management

- *Closed-loop MRP*



Enterprise Management

- *MRP II*

