

ERP (21-550)

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

Session #11



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/~fvalilai*

▪ *Class time*

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

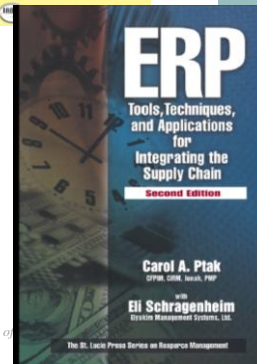
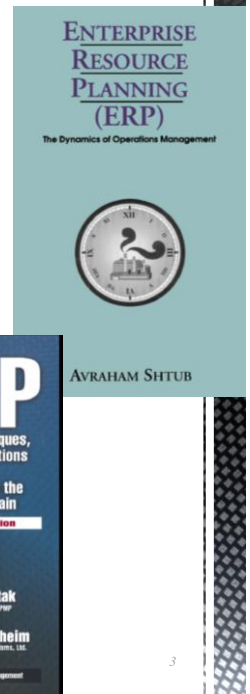
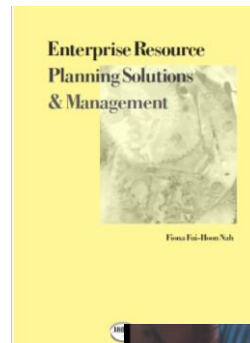
▪ *Course evaluation*

- *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



Advanced Manufacturing Laboratory, Department of Industrial Engineering, Sharif University of Technology
ERP (21-550), Session #11

3

Course Description (Continued ...)

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 - Sunday : 8th Azar 1394, 16:30 ~ 18:00
- **Final Exam:**
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- **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

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ERP (21-550), Session #11

4

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*

Enterprise Management

- **Contents:**
 - *Buffer Resource Strategy*
 - *Murphy's Law: whatever can go wrong will*
 - *Even with the best implementation of planning technology, a clear communicated vision and total alignment of the business processes, Murphy is still alive and well!*
 - *Having a buffer resource strategy allows the enterprise to absorb the variability and still perform to expectations.*
 - *The two most flexible resources in an enterprise are inventory and capacity.*
 - *Both of these resources can be utilized to buffer customer demand from the manufacturing process.*
 - *Inventory is the largest single current asset (noncapital) in most companies today..*

Enterprise Management

- **Contents:**
 - *Buffer Resource Strategy*
 - *The investment in inventory must be made very carefully to assure the best profits possible for the enterprise.*
 - *In the event of excess and obsolete inventory, the true market value is really a small fraction of that value*
 - *Given that customers are demanding higher variety, shorter lead-times, and lower volumes, the modern enterprise must carefully invest its inventory dollars to ensure that it can quickly turn that investment into profit and not loss.*
 - *Capacity is perishable. The capacity that is not used today is no longer available tomorrow. Both these resources must be wisely spent to realize the best benefit for the enterprise.*

Enterprise Management

- *Contents:*
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *Inventory can be successfully used as a strategy to meet the market demand with an acceptable response time.*
 - *The company must ask where it desires to meet the market demand: finished goods, work in progress inventory, or raw materials.*
 - *As collaboration with customers increases, the improved visibility of requirements can significantly reduce the variability of demand for the supplier and provide better service for the customer.*

Enterprise Management

- *Contents:*
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *A make-to-stock company may consider a safety stock of finished goods to buffer the uncertainty of the demand from customers.*
 - *The level of this buffer is directly dependent on the response time to customer demand and the level of demand variability from the customers.*
 - *If the company is able to quickly convert raw materials into finished goods, this end item inventory buffer can be relatively small.*
 - *Unfortunately most make-to-stock companies are asset-intensive industries and do not enjoy flexible capacity.*

Enterprise Management

- *Contents:*
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *A make-to-order company may consider buffering its customer demand variability at the level of common component raw materials.*
 - *This strategy works especially well when the product designers keep the number of raw materials to a minimum through a design for manufacturing focus.*
 - *The lead-time and reliability of the supply base also directly affect this inventory investment. The less reliable the supplier's performance, the higher the level of safety stock that will be required.*

Enterprise Management

- *Contents:*
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *To improve response time with a wide variety of goods without investing heavily in finished goods inventory, many companies have moved to an assemble-to-order philosophy.*
 - *In this strategy, a small variety of semi-finished goods are inventoried followed by the final assembly of a wide product variety being accomplished quickly after customer demand by choosing from the list of alternatives*
 - *Inventory reduction and improved capacity utilization are very common expected return on investment items for an Enterprise Resource Planning (ERP) implementation.*

Enterprise Management

- **Contents:**
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *VAT strategies:*
 - *A “V” plant is one that takes relatively few raw materials to make a wide variety of end items.*
 - *An “A” plant is the exact opposite. This type of plant takes a wide variety of raw materials and assembles them into significantly fewer end items. This enterprise is normally a make-to-stock company.*
 - *The “T” plant holds to a minimum the number of combinations possible until the very last moment. This type of industry is typically an assemble-to-order company.*
 - *Sometimes references are also made to an “I” type company. This is a plant that can be considered a make-to-stock/assemble-to-order company. This enterprise is more vertically integrated. Many different raw materials are*
 - *combined into significantly fewer semi-finished goods from which a wide variety of end items can be assembled.*

Enterprise Management

- **Contents:**
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *An inverse relationship between variety and volume exists.*
 - *In general, as the product volume increases the variety tends to decrease*
 - *A direct relationship exists between lead-time and cost.*
 - *When the business processes are capable and agile, costs dramatically reduce. If the quick response time is accomplished by expediting and manual intervention, short lead-times can be financially disastrous.*
 - *Effective project management requires up-to-date information with which to make quality decisions.*
 - *Having a closed-loop information system that provides feedback to the plan based on actual performance is essential for success in this environment.*
 - *Implementation of ERP in this environment has its unique challenges.*

Enterprise Management

- *Contents:*
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *Make-to-stock companies typically ship to customers on demand.*
 - *The customers are not willing to wait very long for their needs to be fulfilled. They expect the products they want to be on the shelf, typically in a retail environment.*
 - *Since manufacturing has to build products in advance of customer demand, the manufacturing schedule is typically driven by a demand forecast.*
 - *Actual customer demand then consumes this forecast.*
 - *Ideally the sales force will sell to the available to promise (ATP).*
 - *ATP is the uncommitted portion of inventory. ATP assumes that the plan will be executed as designed and provides visibility of how much inventory will be available for customer orders.*

Enterprise Management

- *Contents:*
 - *Buffer Resource Strategy*
 - *Inventory buffers*
 - *A make-to-order company competes in the market by providing a wide variety of products in the shortest lead-time possible.*
 - *In addition to common raw materials, all products in a make-to-order company tend to go through similar operations.*
 - *This type of manufacturing facility is generally capital intensive with general-purpose equipment that can accomplish a wide range of processes.*
 - *To effectively compete in the market, the make-to-order manufacturer tends to focus its marketing in one type of industry such as aerospace and defense, medical devices, or computer parts.*