

## *ERP (21-550)*

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

*Session #17*



## *Course Description*

### ▪ *Instructor*

- *Omid Fatahi Valilai, Ph.D. Industrial Engineering Department, Sharif University of Technology*
- *Email: [FValilai@sharif.edu](mailto:FValilai@sharif.edu), Tel: 6616-5706*
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### ▪ *Class time*

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

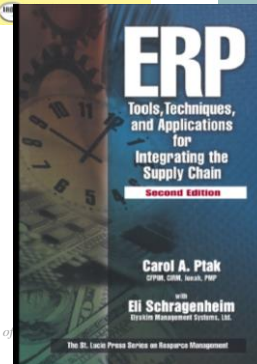
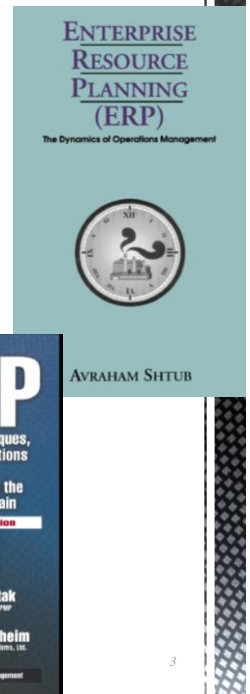
### ▪ *Course evaluation*

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



## Course Description (Continued ...)

- **Mid-term session:**
  - Sunday : 8<sup>th</sup> Azar 1394, 16:30 ~ 18:00
- **Final Exam:**
  - Sunday: 27<sup>th</sup> 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



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  - 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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## *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:*
  - *Operations Management*
    - *Operations Planning (Material and Capacity Requirements Planning)*
  - *Product Life Cycle Management*
  - *Manufacturing Execution System*
  - *Distribution*

## *Operations Management*

- *Product Life Cycle Management*
  - *Effective product design and development is required to support the strategy of quick response to the market.*
  - *This overall process has been rolled into Product Life Cycle Management (PLM).*
  - *The concurrent and collaborative design process dramatically reduces the overall time to market.*
  - *Concurrent engineering uses various computer tools to aid in the design process. The development and use of these computer tools has evolved quickly during the past few years.*
  - *More importantly these tools are now enabling collaboration on designs across several links of the supply chain.*

## Operations Management

- *Product Life Cycle Management*
  - *The use of an effective Product Data Management (PDM) system facilitates the design release, distributes the design data to multiple manufacturing sites, and manages changes to the design in a closed loop fashion.*
  - *PDM provides the vault infrastructure that controls the design cycle and manages change.*
  - *Having control of the electronic and physical documents is essential in a fast moving design process.*

## Operations Management

- *Product Life Cycle Management*
  - *Effective utilization of this design engine can save an organization 15 to 20% in product cost.*
  - *The innovation engine is powered by a PLM system through the collection of what the organization has learned about what works best in designs and provides insight into best practices in design.*
    - *Remember that more than 80% of the final cost of the product is committed during the design phase of the product.*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *The PDM system not only tracks the configuration of the part and the bill of material (BOM), but also tracks the revisions and history of the as designed and as-built conditions.*
    - *By utilizing an integrated CAD and PDM system, the quality of the design is improved and the response time to the market is significantly improved.*
    - *After all the virtual tests, a direct link to manufacturing (computer-aided manufacturing [CAM]) is also possible.*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Until recently the missing link has been used to automatically update the ERP system planning data.*
    - *This is now possible in a seamless connection due to the openness of the database tools and the sophistication of middleware used to perform the linkages.*
    - *This integration into the planning system is essential so that the right part with the right configuration can be ordered at the right time.*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Expected Benefits of PDM*
      - *The enterprise is faced with many challenges both internal and external. The benefits of PDM can be divided into four categories:*
        - *Market share*
        - *Customer satisfaction*
        - *Profit margins*
        - *Returns to stakeholders*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Market Share*
      - *The use of an integrated design system should increase market share since the enterprise can be expected to increase the introduction rate of new products and lower costs.*
      - *PDM significantly reduces the time it takes to bring new products to market by reducing the amount of non-value-added time in the product release process.*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Market Share*
    - *This increased frequency of introduction can help gain a competitive advantage.*
  - *If the competition is releasing products at a slower rate, there is significant potential to grab market share through product innovation.*
  - *This faster introduction of new products at a lower cost can also allow the enterprise to introduce products that meet the needs of emerging market segments or smaller niches that could not otherwise be accessed in a profitable way.*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Customer Satisfaction*
    - *PDM provides the enterprise with the ability to increasingly fit its product introductions to the market needs.*
    - *Feedback from customers can more easily be incorporated and introduced to the market. Since the design, fabrication, and services systems are integrated under a fully implemented ERP system, the components that exhibit early or frequent failure can be identified and the design can be modified to improve overall service levels.*
    - *The PDM system supports the low-cost introduction of additional features, as the market demands them because the design does not have to start from scratch.*



## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Profit Margin*
  - *The use of PDM and CAD can significantly decrease the cost of developing a product.*
  - *The number of derivatives that are possible from the same base design increases.*
  - *A derivative product would share production processes.*

## Operations Management

- *Product Life Cycle Management*
  - *Product Data Management*
    - *Profit Margin*
    - *The basic design of the product is the same; only small changes were made and very different products are available for the market at a very low incremental cost.*
  - *This strategy provided the company with good flexibility as the market demand changed.*
  - *PDM facilitates the reuse of previous designs and knowledge because this information is easy to access and use.*
    - *Where possible, previously proven material and parts are incorporated into new products that are coming to market.*

# Operations Management

- Product Life Cycle Management

- Product Data Management
- Return to the stockholders

