

CIM (21-548)

*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, Tel: 6616-5706*
 - *Website: Sharif.edu/~fvalilai*
- *Class time*
 - *Sunday-Tuesday* *09:00-10:30*
- *Course evaluation*
 - *Mid-term* *(30%)*
 - *Final exam* *(50%)*
 - *Quiz* *(5%)*
 - *Exercise* *(15%)*

Course Description (Continued ...)

- **Mid-term session:**
 - Sunday: 16th Azar 1393, 09:00 ~ 10:30
- **Final Exam:**
 - Tuesday: 30th Dey 1393, 15:00 ~ 17:30
- **Reference:**
 - Schaefer, D., *Cloud-based Design and Manufacturing (CBDM): A Service-Oriented Product Development Paradigm for the 21st Century*, . London: Springer, 2014
 - Koren, Y., *"The Global Manufacturing Revolution"*, Wiley, 2010
 - Nasr, A., *"Computer-Based Design and Manufacturing An Information-Based Approach"*, Springer, 2007
 - Mitchell, F.H., *"CIM Systems: An Introduction to Computer-Integrated Manufacturing"*, Prentice Hall College Div; 1St Edition edition (January 1991), ISBN: 978-0131332997

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Course Description (Continued..)

- **Contents:**
 - Globalization and Manufacturing Paradigms (8 sessions)
 - System Concepts (3 sessions)
 - Evolution of Manufacturing systems (2 sessions)
 - Manufacturing System Design (4 sessions)
 - Manufacturing Layer Design (3 sessions)
 - Information flow in Manufacturing Systems (4 sessions)
 - Product design and Manufacturing System (3 sessions)
 - Manufacturing System Implementation (5 sessions)

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Course Description (Continued..)

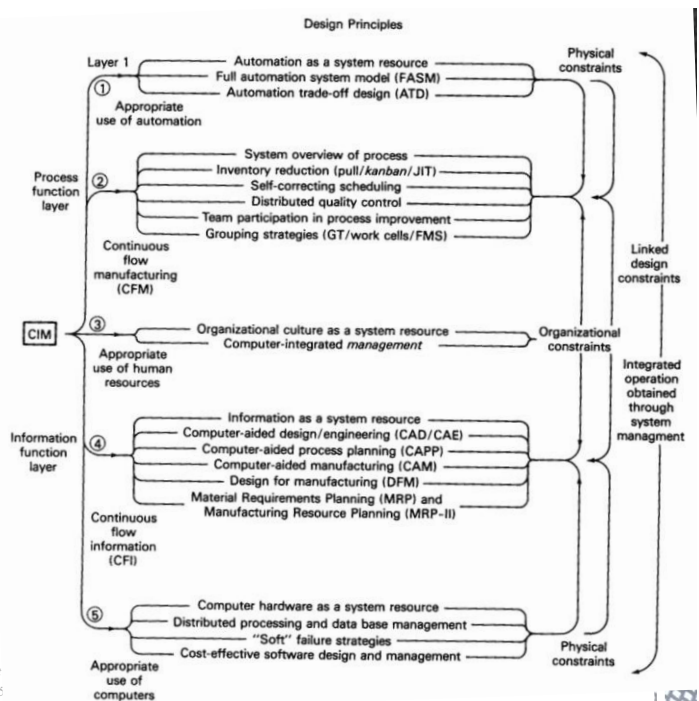
▪ Contents:

- *Manufacturing Layer Design* (3 sessions)
 - *Equipment unit parameters*
 - *Range of equipment technologies and automation available*
 - *Technology assessment*

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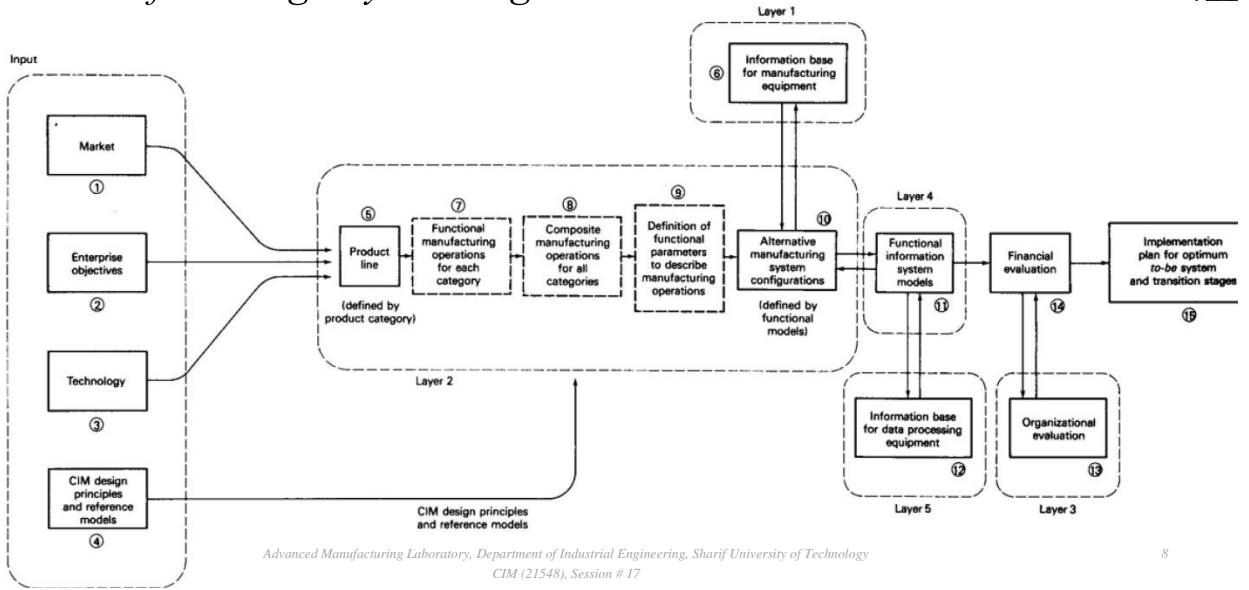
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Manufacturing System I

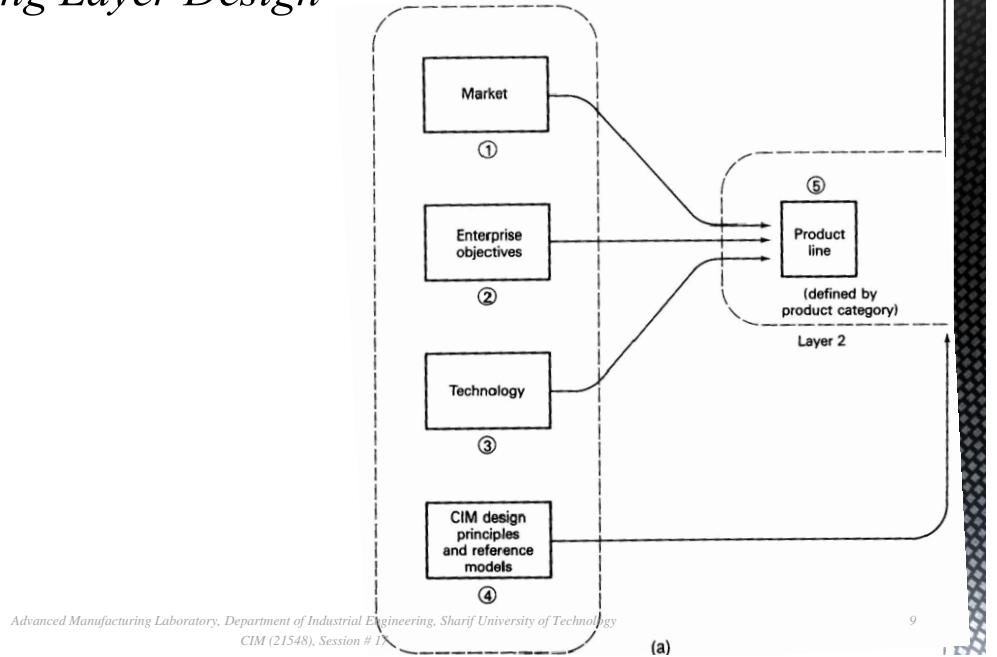


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Manufacturing Layer Design

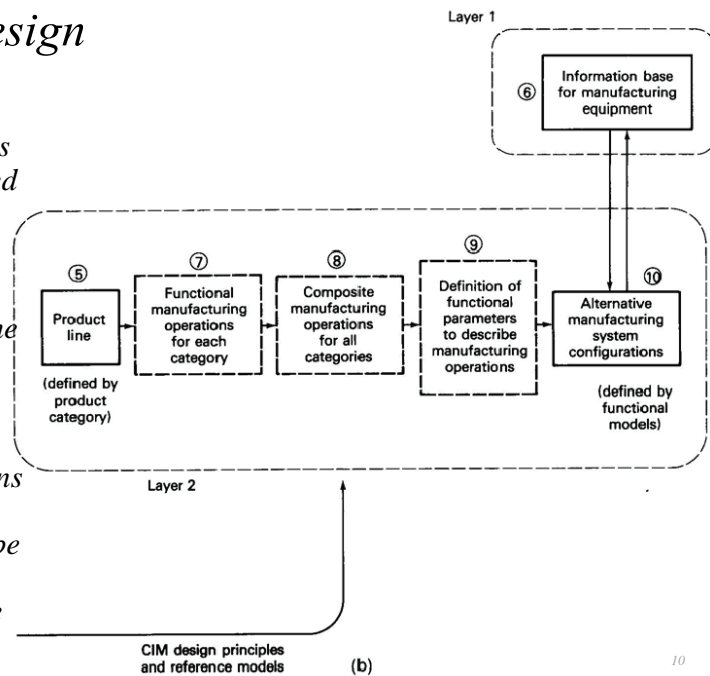


Manufacturing Layer Design



Manufacturing Layer Design

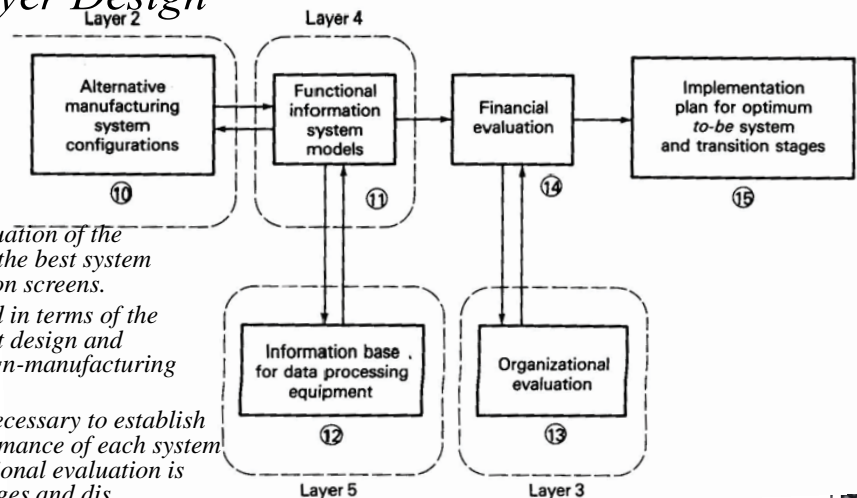
- This sequence of tasks leads to descriptions of alternative manufacturing system configurations that are appropriate for the combined product lines.
- The products that are being considered are used as input to define the alternative manufacturing configurations.
- In turn, the configuration descriptions depend on the manufacturing equipment that is available (or can be produced) and on the application of CIM design principles and reference models.



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Manufacturing Layer Design

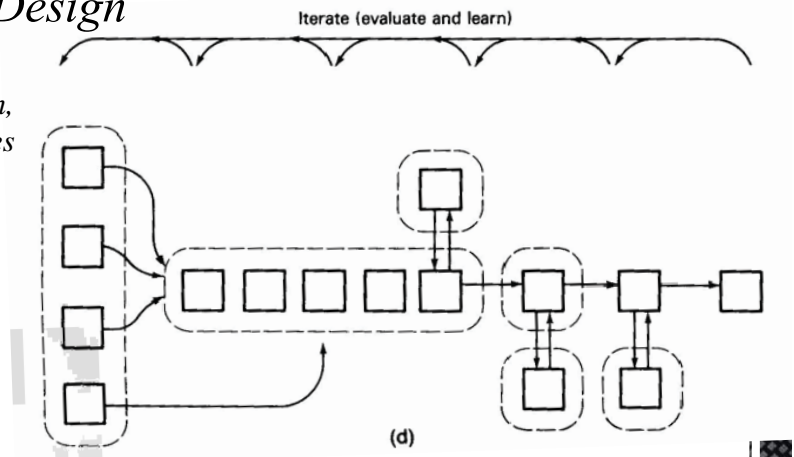
- The final activities require evaluation of the configurations and selection of the best system design, using a series of selection screens.
- configuration must be evaluated in terms of the strategies to be used for product design and manufacturing and for the design-manufacturing interface.
- A financial evaluation is then necessary to establish the costs associated with performance of each system alternative, while the organizational evaluation is necessary to define the advantages and disadvantages that will be experienced in trying to achieve operations with each system alternative.
- Finally, having passed through these screens, the evaluation process can be completed, and an implementation plan can be selected.



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Manufacturing Layer Design

- This sequence initiates the design, evaluation, and learning activities that must take place. Once these tasks have been completed.
- It is necessary to start all over again and iterate through the cycle on a continuing basis.
- Once an implementation plan is selected, the iteration can be used to learn from each stage of the experience.



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Manufacturing Layer Design

- The objective here is to apply the conceptual foundation developed in earlier chapters to the creation of an operational approach for the planning and design of computer-integrated manufacturing systems.
- The approach taken is to develop a step-by-step method that can guide the design process in general.

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