Manufacturing Systems and Information Technology

*Integrating technology in the real world*

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Integrating technology in the real world

build

distribute

use

prepare

recycle
Laboratory for Manufacturing and Productivity
Operations Research in Manufacturing Systems

Stan Gershwin
Laboratory for Manufacturing and Productivity
Massachusetts Institute of Technology
Development and application of operations research models and methods to solve problems in manufacturing systems, supply chains and service operations.
• Supply chain optimization
• Strategic inventory positioning
• Tactical issues in e-retailing
• Production planning and scheduling
Manufacturing Systems Analysis and Engineering

Stanley Gershwin
Laboratory for Manufacturing and Productivity
Massachusetts Institute of Technology
Manufacturing systems *analysis* develops methods for predicting the behavior and performance of manufacturing systems.

Manufacturing systems *engineering* uses these methods to design efficient, effective factories.
Practical theory of manufacturing systems

- Analysis, design, and control
- Behavior as a function of components and connections
- Components
  - Material, machines, buffers, information, material handling
- Connections
  - Topology, geometry and geography
EXAMPLES

How many in-process inventory buffers are needed for a given system, where should they be located, how large should they be, and how should we manage the flow of material into and through the system?

Where should inspection stations be located, how should they be used to decide whether parts are acceptable (and if not, what should be done with them), and how should they be used to determine whether machines require repair?

Given an existing, operating production system, should it be modified when a new product is introduced; should it be totally rebuilt or replaced; or should a separate new system be built for the new product?
How to design material and information flow system for good performance at acceptable cost?
How to design material flow system and inspection system simultaneously to provide optimal quality and quantity performance?
How to use noisy measurements to determine when to perform maintenance?
Auto-ID Center

*Networking the Physical World*

Sanjay Sarma and David Brock
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Auto-ID Center
Massachusetts Institute of Technology
- TAGS: RFID
- EPC: Electronic Product Code
- ONS: Object Name Service
- PML: Physical Markup Language
- Savant™: Distributed Operating System
DATA CENTER

Make sense of your data

David Brock, Founder and Director
Data Center
Massachusetts Institute of Technology