

## **7. Operations Engineering and Management**

Operations Engineering and Management is an area of technical management dealing with the design and analysis of production and service processes. From an industrial engineering viewpoint this knowledge area employs tools and techniques to ensure business operations function efficiently, using as few resources as needed, and effectively in meeting customer requirements.

### **7.1. Operations Planning**

- 7.1.1. Life cycles
  - 7.1.1.1. Product
  - 7.1.1.2. Service
  - 7.1.1.3. Process
- 7.1.2. Forecasting
  - 7.1.2.1. Methods/models
  - 7.1.2.2. Trend based
  - 7.1.2.3. Seasonal series
- 7.1.3. Aggregate planning
- 7.1.4. Market analysis

### **7.2. Project Management**

- 7.2.1. Project as a network
- 7.2.2. Critical path analysis
- 7.2.3. PERT
- 7.2.4. Managing multiple projects
  - 7.2.4.1. Constrained resources

### **7.3. Planning and Control for Manufacturing Systems/Projects**

- 7.3.1. Scheduling
  - 7.3.1.1. Master scheduling
  - 7.3.1.2. Capacity
  - 7.3.1.3. Leveling load demand
- 7.3.2. Sequencing

### **7.4. Production Scheduling**

- 7.4.1. Job shops
- 7.4.2. Continuous flow
- 7.4.3. Just-in-time/Kanban
- 7.4.4. Level loading
- 7.4.5. Work schedules/personnel scheduling

### **7.5. Inventory Management & Control**

- 7.5.1. Known demand
- 7.5.2. Uncertain demand
- 7.5.3. Make to order

- 7.5.4. Make to assembly
- 7.5.5. Make to stock

## **7.6. Capacity Management**

- 7.6.1. Labor
- 7.6.2. Equipment
- 7.6.3. Materials
- 7.6.4. Demand management (voice of customer)
- 7.6.5. Throughput

## **7.7. Materials Requirements Planning**

- 7.7.1. Master production schedule
- 7.7.2. Explosion calculus
- 7.7.3. Lot synergy
- 7.7.4. Multiline optimization
- 7.7.5. Enterprise resource planning

## **7.8. Purchasing/Supply Chain**

- 7.8.1. (See Supply Chain Management knowledge area)

## **7.9. Maintenance Management & Control**

- 7.9.1. Maintenance models
- 7.9.2. Total productive maintenance

## **7.10. Organizational Issues**

- 7.10.1. (See Engineering Management knowledge area)

## **7.11. Product Lifecycle Management**

- 7.11.1. Aftermarket
- 7.11.2. Spares
- 7.11.3. Repairs
- 7.11.4. Warranty/non-warranty/good-will

## **7.12. Operational Metrics**

- 7.12.1. Cost
- 7.12.2. Quality
- 7.12.3. Service level
- 7.12.4. Delivery
- 7.12.5. Productivity
- 7.12.6. Throughput
- 7.12.7. Plan effectiveness

## **REFERENCES:**

*Service Operations Management: Improving Service Delivery.* Johnston, R., Clark, C. and Shulver, M. Pearson, 4<sup>th</sup> Edition. 2012.

*Production and Operations Analysis*. Nahmias, S. and T. Lennon Olsen. Waveland Press, Inc., 7<sup>th</sup> Edition. 2015.

*Operations Management: Creating Value Along the Supply Chain*. Russell, Roberta S. and Taylor, Bernard W. John Wiley & Sons, 7<sup>th</sup> Edition. 2011.