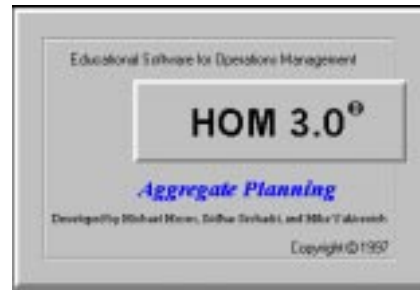


Gaining Competitive Advantage From Operations Using the HOM Software System



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Outline

- History
- Software details

Brief History

- STORM in 1993
- 1994 January First Project
- Fall 1994: QuattroPro add ins
- Spring 1995: Upgrade, Excel macros
- Fall 1995 through Spring 1996: HOM 2.1
- Spring 1997: Started Windows version
- March 1998: HOM 3.0 (Preview Edition)
- November 1998: HOM 3.0 (Release Version)

Philosophy

- Operations Key to Gaining and Maintaining Competitive Advantage for Most Firms
- Key Facilitators
 - ◆ Process
 - ◆ Supply Chain
 - ◆ Capacity
 - ◆ Responsiveness
 - ◆ Quality

Contents

- Software - HOM
- Cases
- Solutions

Capabilities - Software - HOM

- Windows 3.1/95/98/NT Compatible
- Single Window Problem Formulation
- Optimum Seeking Where Appropriate
- Simulation Modeling
- Spreadsheet/Managerial Orientation
- How to Solve - Help
- Simple Import/Export of Data and Results

Capabilities ...

- Networkable
- Available for downloading off the internet

Capabilities - Cases

- Tutorial Case -- Master Craftsmen of Newport
 - ◆ A case covering every HOM application with discussion of problem formulation, data files, screen shots of Input and Output windows, and interpretation of results.
- Two Integrative Proprietary Cases that Cover Every Operations Issue
 - ◆ Ice Queen Snow Blowers (Manufacturing)
 - ◆ United Branch Bank Consolidation (Service)

Cases

- Additional Proprietary Cases for Each Section
 - ◆ Process Analysis: Mathews Mug and Muffins, Tenafly Bagel, Violet Film Processing
 - ◆ Time to Market: Toy City
 - ◆ Waiting Line: New England Island Air
 - ◆ Inventory: The Nut Case
 - ◆ Aggregate Planning: TCB Check Processing

Capabilities - Solutions

- Solutions for all Proprietary Cases
- Solutions/Enhancements for Popular Cases
 - ◆ Kristen's Cookie Co.
 - ◆ Donner, Co.
 - ◆ Blanchard
 - ◆ Etc.
- Solutions for Sample Problems for Irwin/McGraw Hill Texts

Software Overview

Competitive Advantage

- Process Improvements
- Supply Chain Management
- Capacity Management
- Responsiveness
- Quality Management

Software Modules

- ◆ Process Analysis
- ◆ Waiting Line Analysis
- ◆ Inventory Modeling
- ◆ Materials Requirement Planning
- ◆ Facility Location (Fall 1999)
- ◆ Forecasting
- ◆ Aggregate Planning
- ◆ CPM-PERT - Crashing
- ◆ Process Analysis
- ◆ Statistical Process Control
- ◆ Acceptance Sampling

Software Details - Process Analysis

- Model Up to 15 Products
- Each Product has Unique Task Sequence, Priority, and Lot Size
- Model Several Types of Labor - General and Task Specific
- Each Task can
 - ◆ Process Jobs One at a Time, Batch, Continuous Flow
 - ◆ Require a Setup in Addition to Run Time
- Randomness Can Occur In Demand Arrivals, Processing Time
- Job Selection -- FCFS, Set Up Saving
- Results - Output, Capacity Utilization for Each Task and Delays Due to Labor and/or Material, Product Flow Time Distribution

Software Details - Waiting Line

- Arrival Pattern - Exponential, Erlang, **General, Empirical**
- Service Time Pattern - Exponential, Erlang, **General, Empirical**
- **Queue Joining Discipline** - Random, Shortest Line, Jockey, Cyclic
- Job Selection - FCFS and **SPT**
- Standard Waiting Line Outputs
- **Wait Time Distribution**

Software Details - Project Management

- Critical Path Analysis
- PERT
 - ◆ Simulation
- Crashing
 - ◆ Linear Programming
- Output
 - ◆ Early/Late Start Gantt Chart Form
 - ◆ Completion Time Distribution
 - ◆ Criticality Index

Software Details - Forecasting

- Techniques Available
 - ◆ Exponential Smoothing
 - ◆ Trend Regressed
 - ◆ FIT Smoothing
 - ◆ Moving Average
 - ◆ Simple Average
 - ◆ Best of Above
 - ◆ Weighted Moving Average
 - ◆ **Winter's Method**
 - ◆ Multiple Regression
- Allows for User Determination or Program Optimization of Parameters
- Allows for **De-seasonalization and De-trending of Data**
- Automatic Plotting of Data, Results, Deviations
- Robust Set of Statistical Measures
- Allows for MAD and Forecast Tailoring

Software Details - Inventory

■ Models Available

- ◆ EOQ -- Finite & Infinite Replenishment Rate, Quantity Discounts, Back Orders, Safety Stock
- ◆ **Joint Optimization** of Order Quantity and Safety Stock
- ◆ Periodic Review Model-- Safety Stock
- ◆ **MRP**: Low Level Coding, Batching Rules (FOQ, FPQ, LTL, LUC, LTC, Silver Meal), Rescheduling/Expediting

Software Details - Aggregate Planning

- Up to Three Products
- Up to 24 Time Periods
- Hire/Fire Costs
- Finite Setup Times and Relevant Costs Between Products
- Shift Employment Minimums and Maximums
- Lost Sales, Subcontracting, or Stockout Costing
- Develops **Mixed Integer Optimal Solution**
- Emulates Chase and Level Production and Workforce Strategies
- Variable Length of Time Periods Allowed

Software Details -- Quality Management

■ Statistical Process Control

- ◆ Sampling by Variables (\bar{X} , R, s charts)
- ◆ Sampling by Attributes (p, np, c, u charts)
 - ◆ **Several Statistical Tests**

■ Acceptance Sampling

- ◆ OC Curve
- ◆ Determination of Sampling Plan

Future

- Supply Chain Management
- Enhance Process Management
- Scheduling
- Real Time Process Visualization
- Visit: <http://www.stern.nyu.edu/HOM>