



SEVAPORT Project

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SEVAPORT Grant

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- Administered by Opportunity Inc.
- Many different groups/efforts involved
- Disclaimer

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Our Project

- In-depth study of Hampton Roads **T**ransportation, **W**arehousing, and **D**istribution (TWD) operations
 - White paper
 - Performance benchmarks
 - Determine TWD training needs
- Initiating curriculum development in TWD topics
- Training/Awareness of Modeling and Simulation



HR TWD White Paper

- Web site link
masonweb.wm.edu/sevaproport/
- HR TWD operations are world class
 - World class is a moving target
 - Improvement always needed
 - M&S, Lean, and Six Sigma can help here
- Our study took place during difficult times
 - Fuel cost spiked, recession hit
 - In response, some distribution operations exhibited flexibility
 - Observed responses reduced transportation cost



TWD Findings-Skills

- Required job applicant skill categories:
 - Fundamental Skills
 - Basic math, logical thinking, punctuality, willingness to learn, flexibility, etc.
 - Technical skills
 - Picking systems knowledge, equipment troubleshooting and programming, knowledge of WMS, WCS, TLS, YMS software, etc.
- Which skills are most important?
 - Fundamental: 80%
 - “We can train on technical systems”
 - Technical: 20%



TWD Findings-Technology

- At a *high* level, these are technologies used:
 - Warehouse Management System (WMS)
 - Warehouse Control System (WCS)
 - Truck Loading System (TLS)
 - Yard Management Software (YMS)
 - Distribution Center Automation (sometimes)
- At *high* level TWD processes
 - Incoming → (Put-away) → Outgoing
 - Picking → Packing → Loading → Shipping
- At a *high* level all operations have power equipment



TWD Findings-Technology

- TWD Technologies not implemented in uniformly for forms at operational level
- Dissimilarities at a operational level
 - Different software packages
 - Different data entry/communication methods:
 - Voice-pick systems
 - Paper pick sheets
 - Pick-to-light systems
 - Different equipment vendors
 - Different process/procedure details



TWD Findings-Training

- Our suggested training falls into these categories:
 - Specific skills that are fairly transferrable
 - Specific skills that are not fully transferrable
 - Serves as a hiring signal and qualification
 - Evaluated student's affinity to particular skills
 - Would develop basic understanding of processes and equipment
 - Must be expectation of retraining
 - General Topics



TWD Findings-Training

- Skills training examples
 - Truck driver training
 - Power Equipment Training
 - Forklift, clamp truck, other Power Equipment
 - Picking training
- General courses
 - Supply Chain Management 101
 - Typical supply chains, roles of facilities, decision-making processes
 - Note: whitepaper materials are curriculum basis
 - Warehousing/Distribution Centers 101
 - Transportation and Logistics 101
 - Lean Six Sigma Process Improvement



TWD General Knowledge-Training

- Other general training topics (continued):
 - Health and Safety Orientation
 - Perhaps some OSHA regulation training also
 - Freight Forwarding
 - Problem Solving
 - Sustainability (possibly important for future??)
- See white paper for details



Initiate TWD Training Curriculum

- Community Colleges Consortium
 - **Tidewater CC**
 - **Paul D. Camp CC**
 - Thomas Nelson CC
 - The Pruden Center
- Requirements for success:
 - Funding
 - Students
 - Companies to hire graduates
 - Appropriate curriculum



Initiate TWD Training Curriculum

- If you are interested in supporting or influencing this program, then contact:

Al Will

Coordinator, Workforce Development

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Modeling and Simulation Training

- M&S was a focus of the study
 - How to grow the M&S industry in HR
 - Opportunities to apply M&S to TWD operations
- Our conclusions—in brief
 - Many opportunities for process analysis
 - Most DCs do not have the staffing to do M&S
 - “Central office”, consultants, and academics are required
 - Opportunities for simpler M&S/analysis
 - “Desktop M&S”
 - Awareness issue: M&S isn’t just complex war fighting simulations
 - Many other kinds of simulation and applications



Modeling and Simulation Training

- M&S overview session at VMASC on 1/15
- 4 follow-up sessions
 - Excel I
 - Excel II
 - Risk Modeling and Analysis
 - Modeling and mitigating catastrophic disruptions
 - Discrete-Event Computer Simulation
 - Analyzing process performance without investing in equipment or rearranging the process
 - Variation and uncertainty degrade process performance
 - Examples: crossdocking operation, port operations
 - Applicability: all processes



Modeling and Simulation Seminars

- E-mail for details or to register:
james.bradley@mason.wm.edu

Date	Topic	Location
March 26	Unlocking the Extraordinary Power of Excel: Part 1	William and Mary Peninsula Center Directions
April 9	Assessing and Reducing Your Company's Vulnerability to Catastrophes	VMASC
April 30	Unlocking the Extraordinary Power of Excel: Part 2	William and Mary Peninsula Center Directions
May 14	Using Computer Simulation to Make Better Decisions	VMASC



Modeling and Simulation Seminars

Unlocking the Extraordinary Power of Excel: 1

Excel is the most frequently used analysis tool in business. Because it is universally available and recognized, it is important to be aware of all its potential. This seminar will demonstrate practical applications of the power of Excel and make previously impractical analysis possible. There will be many examples and lots of discussion. The topics for discussion will include:

- Basics—Ribbon System, Setting Options , Quick Access Menu
- The look and feel of *effective* Excel spreadsheets—Feng Shui of Spreadsheets
- Collecting data with Excel—Data Entry/Data Validation
- Statistical analysis with Excel—The treasure of the Data Analysis tool
- Graphical analysis with Excel —Visualizing data and its patterns
- Creating and analyzing small databases with Excel—Pivot tables/Sorting/Filtering
- Creating What-if models with Excel—Scenario building and sensitivity analysis



Modeling and Simulation Seminars

Unlocking the Extraordinary Power of Excel: 2

Excel is the most frequently used analysis tool in business. Because it is universally available and recognized, it is important to be aware of all its potential. This seminar will demonstrate practical applications of the power of Excel and make previously impractical analysis possible. Our emphasis will be on model building and analysis, particularly using Monte Carlo simulation to model and analyze **risk**. There will be many examples and lots of discussion. The topics for discussion will include:

- Statistical Analysis Continued
- Pivot tables
- Deterministic Models
- Modeling the realism of risk and uncertainty with Excel—Sampling with Excel
- Choosing an approach to model risk—How much complexity is enough?
- How do we quantify risk—3 ways to view uncertain events
- A strategy for modeling—Making sure you don't waste time and effort
- The *Mother of All Business Simulations*—Monte Carlo Methods
- Presentation of Monte Carlo results—The risk profile
- Simple Macros, Sensitivity Analysis, Scenarios, Optimization



Modeling and Simulation Seminars

Assessing and Reducing Your Company's Vulnerability to Catastrophes

Every company, facility, and supply chain faces the risk that its operations will be shut down to catastrophic events, such as 9/11, natural disasters, and pandemics.

This session will give you:

- A framework to assess the risk that your company faces,
- A method of measuring risk,
- A method to prioritize your actions to reduce risk,
- Examples of actions that reduce risk, and
- A process to implement your plan

An overview of the above approach will be summarized and, then, the attendees will work on an exercise to better understand the steps above. Possible applications of modeling and simulation to this problem will be discussed.



Modeling and Simulation Seminars

Making Better Decisions with Computer Simulation

Installation of new equipment and changes to distribution center (DC) processes often involve significant monetary investment or effort to rearrange DC processes. Computer simulation offers an opportunity to evaluate the impact of these changes on critical performance measures before the investment is made, thus possibly avoiding an investment that doesn't payoff and increasing the chance of a successful process improvement. This seminar will:

- Demonstrate how simulation models are constructed with discrete-event simulation software packages.
- Show how simulation models would be used in an overall analysis to determine the best way to design or improve a DC process.

Although this seminar will focus on simulation used in the context of a distribution center, it is relevant for all types of businesses.



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