Using Cost and Operational Data to Improve Warehousing Decisions

Presented by
Tom Speh
Miami University of Ohio
&
Bob Murray
REM Associates of Princeton, Inc.
Determining Total Warehouse Costs

Presented by
Thomas W. Speh
Director
Warehouse Research Center
Miami University, Ohio
Introduction

The Importance of Warehousing Costing

1. Warehousing costs are an important element of supply chain costs
   A. 2.09% of sales dollars
   B. 25% of all logistics costs
The Importance of Warehousing Costing

2. Warehousing is frequently outsourced
   A. Both parties must know the costs
   B. Both parties must agree on which costs to include
   C. Costs are an important floor against which profits are established
Introduction (continued)

The Importance of Warehousing Costing

3. Warehousing is often benchmarked, a target for cost improvement or charged to another function

   A. Need to have a common costing process or approach
   B. Need a valid and reliable cost base against which to measure change
Familiar Faces ?
Rationale for the Warehouse Cost Study

A. Warehouse Cost Comparison
   1. Apples-to-Apples: Same Cost
   2. Consider All Warehouse Costs
How the Model Was Developed

A. Field Research
   1. Public Warehouse Input
   2. Private Warehouse Input

B. Model Creation

C. Model Refinement

D. Model/Diskette
Joe’s Warehouse
What We Learned From Field Research

A. Public Warehouse Costing
B. Private Warehouse Costing
   1. Costing Process
   2. Cost Elements
   3. Perceptions
The Research Showed

A. Same Costs: Hide Them Different Places

B. PW - PVT Warehouse Costing: Done for Different Purposes
   A. PW: Rate
   B. PVT: Charge To Product/Division

C. Different Cost Centers
The Research Showed (continued)

D. Some private warehouse costs
   A. Assigned directly to a division
   B. Viewed as plant costs
   C. Assumed by corporate
   D. Found in cost of goods sold
   E. Charged to a product

E. Sensitive Issue
   A. Operating & General Administrative Expense
The Research Showed (continued)

E. Examples of costs excluded from private warehouse cost centers

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Charged To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse – MIS</td>
<td>Corporate or Division</td>
</tr>
<tr>
<td>Warehouse Maintenance</td>
<td>Plant or Divisions</td>
</tr>
<tr>
<td>Warehouse Janitorial</td>
<td>Plant</td>
</tr>
<tr>
<td>Recoup</td>
<td>Plant</td>
</tr>
</tbody>
</table>
The Research Showed
(continued)

E. Examples of costs excluded from private warehouse cost centers

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Charged To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse Manager</td>
<td>Garage &amp; Traffic</td>
</tr>
<tr>
<td>Damage, Shrinkage</td>
<td>Divisions or COGs</td>
</tr>
<tr>
<td>Depreciation, Taxes, Insurances</td>
<td>Divisions</td>
</tr>
<tr>
<td>Warehouse Office Salaries</td>
<td>Divisions</td>
</tr>
</tbody>
</table>
The Research Showed (continued)

E. Examples of costs excluded from private warehouse cost centers

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Charged To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labeling, Shrink Wrap</td>
<td>Product</td>
</tr>
<tr>
<td>Rent, Utilities</td>
<td>Divisions</td>
</tr>
<tr>
<td>Corporate Logistics Support</td>
<td>Divisions</td>
</tr>
<tr>
<td>Corporate Overhead</td>
<td>Divisions</td>
</tr>
</tbody>
</table>
Conclusions From Field Research

A. Most private warehouses do not compare a “Fully loaded” warehouse cost to a public warehouse rate

B. Private warehouses know their costs, but don’t assemble a total warehouse cost

C. Do not segregate costs into storage and handling
The Model: Objectives

A. Common set of cost elements
B. Comprehensive costs
C. Generalized costing methodology
D. Easy to use
E. Flexible, not dogmatic
F. Understand costs in other warehouse settings
Harry M. Warner

“WHO THE HELL WANTS TO HEAR ACTORS TALK?”
HARRY M. WARNER
1927
The Model: Logic

A. Individual warehouse facility
B. Common chart of accounts: Described in detail
C. Cost categories
   1. Handling expense
   2. Storage expense
   3. Operating administrative expense (OA)
   4. General administrative expense (GA)
The Model: Logic (continued)

A. Allocate to OA and GA to handling and storage
   1. Public
      A. Consider number of facilities
      B. Other functions, e.g. Transportation
   2. Private
      A. Incremental
      B. Would costs be “Eliminated” or “Reassigned” if the warehouse closed
The Executive Salaries

PUBLIC: This category includes the appropriate portion of payments to company officers and executives (excluding marketing). The elements included are salaries, bonuses, fringe benefits, compensated time-off and payroll taxes.
The Executive Salaries

PRIVATE: This category would include "appropriate" allocations of payments to company executives and corporate office managers who devote some or all of their time to warehousing. The amount of allocation is company-specific and based on the logic of the situation existing at each firm. Personnel in this group may include the manager of warehousing or logistics director/manager. In some firms, it may be reasonable to allocate some portion of higher level executive salaries to the warehouse (such as vice president of logistics, group vice president, etc.)
The Executive Salaries

The elements included are salaries, bonuses, fringe benefits, compensated time-off, and payroll taxes.
Handling Expense

A. “Movement”

B. Components
   1. Labor
   2. Equipment
   3. Supplies
   4. Other
Examples of Handling Activities

- Unloading inbound vehicles
- Palletizing/sorting inbound goods
- Handling inbound carrier damage
- Placing goods in storage
- Filling orders
- Staging outbound orders
Examples of Handling Activities

- Checking outbound orders
- Loading outbound vehicles
- Rewarehousing
- Janitorial/sanitation work
- Segregating warehouse damage
- Q/A checking
- Stickering
Examples of Handling Activities

- Equipment pre-operation check
- Scheduled breaks
- Training & meetings
- Recouping warehouse damage
- Handling merchandise returns
- Sampling
Handling Expense Elements

A. Warehouse labor
   1. Direct payment to employees
   2. Compensated fringe benefits
   3. Compensated time-off
   4. Statutory payroll taxes
   5. Purchased labor
   6. Fees and compensated time
Handling Expense Elements

B. Handling Equipment

1. Lift trucks and attachments
2. Special purpose handling equipment
Handling Expense Elements

C. Other handling equipment
1. Pallets
2. Supplies
3. Detention / demurrage
4. Recouping warehouse damage
5. Trash hauling
6. Other
Storage Expense

A. Goods “At rest”
B. Cost of:
   1. Renting / owning
   2. Operating
Rent or Depreciation and Interest

This category includes the costs of renting or owning the building.

If the building is rented, the appropriate cost is the annual rental fee. If the building is owned, there is some question as to the appropriate expense. One approach is to include the yearly depreciation charge as well as the associated interest cost on borrowed capital. However, some warehousers prefer to recognize the current market value of the building when calculating the facility cost. From a decision-making perspective, the appropriate expense would be the opportunity cost of occupying the building, which would be the approximate market rent at which the building could be rented. (This situation might arise in cases where the cost or current lease rate is extremely low relative to rental costs in similar buildings in close proximity.)
Storage Expense Elements

A. Facility
   1. Rent or depreciation and interest
   2. Real estate taxes
   3. Insurance
   4. Exterior Maintenance

B. Grounds

C. Storage Equipment
Storage Expense Elements

D. Facility modification
E. Utilities
F. Interior maintenance
G. Security
H. Pest control
I. Other facility expenses
Operating Administrative Expense

A. Direct costs for this facility
B. Supports the operations
C. Disappear if the facility is closed
D. Supervision, clerical, DP, supplies, office, etc.
Operating Administrative Expense Elements

A. Supervisory salaries
B. Clerical salaries
C. Purchased labor
D. Office equipment (Major)
E. Office equipment (Minor)
F. Office maintenance
Operating Administrative Expense Elements

G. Telephone / Fax
H. Postage
I. Printing
J. Office supplies
K. Data processing
L. Legal and professional
M. Taxes and licenses
Operating Administrative Expense Elements

N. Travel
O. Personal property tax
P. Insurance and claims
Q. Losses due to damage, shortages and errors
R. Other
General Administrative Expense

A. Not directly incurred for a facility
B. Generally supports warehouse or logistics mission
C. Staff, non-operating personnel in “General” or corporate office
D. General support activities
   1. PW: General office
   2. PVT: Corporate logistics cost
Tris Speaker

“RUTH MADE A BIG MISTAKE WHEN HE GAVE UP PITCHING”

TRIS SPEAKER, 1921
Travel Expense

PUBLIC: This category includes travel expenses for general office personnel.

PRIVATE: This category would include the "appropriate" portion of corporate management and corporate logistics management travel expenses that relate to the private warehouse mission. If corporate office travel expense would be reduced or reassigned as a result of closing a private warehouse, the estimated reduction can be assigned to warehousing cost in this section. For example, the closing of a warehouse might eliminate four quarterly visits to the facility, and the associated corporate logistics travel expenses could be assigned to warehousing.
General Administrative Expense Elements

A. Executive salaries
B. Marketing salaries
C. Support salaries
D. Office expense
E. Automobile expense
F. General office operations
G. Data processing
General Administrative Expense Elements

H. Taxes
I. Legal and professional
J. Selling and advertising
K. Travel expense
L. Dues, subscriptions, and educational expense
General Administrative Expense Elements

M. Donations
N. Personnel
O. Bad debt expense
P. Other non-operating expense
Flexibility In Use

A. Put costs anywhere
B. Combine categories
C. Ignore categories
D. Public warehouse profit margin
Model: Structure

A. Descriptions
   1. Definition
   2. Components

B. Form

C. Diskette
Sample

WAREHOUSING COST CALCULATION FOR (Use annual expenses)

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DCW-USA
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1. HANDLING EXPENSE

1. Warehouse Labor

<table>
<thead>
<tr>
<th></th>
<th>WH 1</th>
<th>WH 2</th>
<th>WH 3</th>
<th>WH 4</th>
<th>WH 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Wages</td>
<td>360000</td>
<td>40000</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>b. Bonuses</td>
<td>42000</td>
<td></td>
<td>52000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Overtime</td>
<td>32200</td>
<td></td>
<td>42200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Other</td>
<td>15000</td>
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<td>15000</td>
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<tr>
<td>Total</td>
<td>449200</td>
<td>509200</td>
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</tr>
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</table>

2. Compensated Fringe Benefits

<table>
<thead>
<tr>
<th></th>
<th>WH 1</th>
<th>WH 2</th>
<th>WH 3</th>
<th>WH 4</th>
<th>WH 5</th>
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</thead>
<tbody>
<tr>
<td>a. Health &amp; welfare</td>
<td>68000</td>
<td></td>
<td>78000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Pension</td>
<td>24000</td>
<td></td>
<td>28000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Life insurance</td>
<td>25000</td>
<td></td>
<td>27000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Uniforms</td>
<td>1000</td>
<td></td>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Other</td>
<td>0</td>
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<td>Total</td>
<td>118000</td>
<td>136000</td>
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3. Compensated Time-off

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<tr>
<th></th>
<th>WH 1</th>
<th>WH 2</th>
<th>WH 3</th>
<th>WH 4</th>
<th>WH 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Vacation</td>
<td>10000</td>
<td></td>
<td>12000</td>
<td></td>
<td>4000</td>
</tr>
<tr>
<td>b. Holidays</td>
<td>3000</td>
<td></td>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Funeral</td>
<td>2000</td>
<td></td>
<td>3000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Sick Pay</td>
<td>4000</td>
<td></td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Personal leave</td>
<td>2000</td>
<td></td>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Jury duty</td>
<td>3000</td>
<td></td>
<td>4000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Other</td>
<td>6000</td>
<td></td>
<td>7000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>30000</td>
<td></td>
<td>36000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Warehouse Labor

1. Direct payment to employees

This category includes wages paid to warehousemen, including forklift operators, leadmen, working foremen, casual labor, part-time labor, janitors, and salvage labor.

The expenses for warehouse labor include regular wages, bonuses, and overtime.
The Model: Output

A. Total handling cost
B. Total storage cost
C. Handling cost per man hour
D. Storage cost per gross sq. ft.
E. Handling “Rate” per unit
F. Monthly storage “Rate” per unit
Handling Expense Per Man-Hour

Total direct handling expense

+ Plus +

Allocated OA & GA expense

Divided by

Total annual man-hours*

*Man-hours

1. For all labor

2. “Total paid hours, less paid, but not worked hours
   (Holidays, vacations, sick days, etc.)
Storage Expense Per Gross Square Foot

Total direct storage expense
+ Plus +
Allocated OA & GA Expense
Divided by
Total warehouse gross square feet*

*Gross square feet = Total building area
Handling “Rate” Per Unit

Handling expense per man-hour
Divided by
Throughput units per man-hour*

*Throughput units per man-hour = Total annual receipts + Plus +
Total annual shipments Divided by
Divided by
Total man-hours
Storage “Rate” Per Unit

Total storage expense per gross square feet
Divided by 12
= Monthly storage per square feet
Divided by
Units stored per gross foot per month*

*Units stored per gross foot per month = peak inventory during a month
Divided by
Gross square feet
# Rate Samples

## VII. HANDLING "RATE" PER UNIT

**STEP A.** Handling Cost Per Man-Hour from handling cost calculation

<table>
<thead>
<tr>
<th>Cost per man-hour</th>
<th>32.000</th>
<th>27.331</th>
</tr>
</thead>
</table>

**STEP B.** Estimated Throughput Units Per Man-Hour - 540

**STEP C.** Handling "RATE" Per Unit -

<table>
<thead>
<tr>
<th>32.000</th>
<th>540</th>
<th>37.361</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0590</td>
<td></td>
<td>0.0440</td>
</tr>
</tbody>
</table>

## VIII. STORAGE "RATE" PER UNIT

**STEP A.** Monthly Storage Cost Per Gross Square Feet -

<table>
<thead>
<tr>
<th>0.1450</th>
<th>0.12</th>
<th>0.12</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.287083</td>
<td>0.29373</td>
<td></td>
</tr>
</tbody>
</table>

**STEP B.** Estimated Peak Monthly Inventory (in units) - 250000

Divided by Gross Square Feet - 140000

| 250000 | 140000 |

Units/Sq.Ft./Month - 2.75

(where units = CASES)

**STEP C.** Storage "RATE" Per Unit -

| 0.287083 | 0.29373 |
| 2.75 | 2.75 |

MONTHLY STORAGE RATE PER CASE -

| 0.0250 | 0.0211 |
The Model: Benefits

A. Standardized approach for warehousing costing
B. Standardized format: Which costs to include
C. Comprehensive
D. Standardized level of detail
E. Benchmark
Profit Margin

STEP D: Public Warehouse Profit Margin

1. Total Handling Expense (STEP C) times Profit Percentage = Profit Dollars.
\[
\frac{\text{Total Handling Expense, STEP C}}{} \times \frac{\text{Desired Profit Percentage}}{} = \frac{\text{Profit Dollars}}{}
\]

2. Profit Dollars + Total Handling Expense = Total Handling Expense plus Profit
\[
\frac{\text{Profit Dollars, STEP D-1}}{} + \frac{\text{Total Handling Expense, STEP C}}{} = \frac{\text{Total Handling Expense plus Profit}}{}
\]
The Model: Diskette

A. Lotus 1-2-3 spreadsheet
B. Organization: “Cost calculation form”
C. Compare up to 5 warehouses on one screen
The Model: Hot Spots

A. Separation of cost into handling & storage components
B. General and administrative expenses!!!
C. Data collection effort
D. Unavailable costs
   1. “Pass throughs”
   2. Depreciation, insurance, taxes, damage
Lord Kelvin

“HEAVIER THAN AIR FLYING MACHINES ARE IMPOSSIBLE”
LORD KELVIN, c. 1895
The Model: Hot Spots (continued)

E. Real estate value

F. Accounting system weaknesses: Costs not obvious in company ledger

G. How to treat turnover, productivity, order characteristics, etc.
Some Applications

- Sara Lee: Blueprint for warehouse operating cost: 30+ divisions
- 3M: 40 facilities
- Benchmark study: 4 firms
- Navistar: Uniform approach for 10 facilities
- J & J: Public warehouse quotes
- Contract warehouse agreement
Application: Sara Lee

DC operations committee:
For cross-divisional approach to distribution opportunities

First Task: Common method of costing for each of the 30+ divisions

Model: Method for collecting and analyzing cost on which all divisions could standardize
Applications

- Capital expenditure programs
  - Justification
  - Help manage
  - Compare results to expectations
- Cost reduction programs
- Evaluation of lease vs. buy
- Tracking cost reductions
  - Are projected results actually achieved?
Warehousing Benchmark Study

- Four firms in different industries
- Model used to develop standardized costing methodology among the four firms
  - Significant effort to “Normalize”
    - Agree on what costs to be included in each category
- Cost model information used to develop three key benchmarks
<table>
<thead>
<tr>
<th>Handling Expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Firm A</strong></td>
</tr>
<tr>
<td>Direct Payments to Employees</td>
</tr>
<tr>
<td>a. Wages</td>
</tr>
<tr>
<td>b. Bonuses</td>
</tr>
<tr>
<td>c. Overtime</td>
</tr>
<tr>
<td>d. Other</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Health &amp; Welfare</td>
</tr>
<tr>
<td>b. Vacation</td>
</tr>
<tr>
<td>c. 401(k)</td>
</tr>
<tr>
<td>d. IRAs</td>
</tr>
<tr>
<td>e. Other</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compressed Time-off</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Vacation</td>
</tr>
<tr>
<td>b. Holidays</td>
</tr>
<tr>
<td>c. PTO</td>
</tr>
<tr>
<td>d. Sick Pay</td>
</tr>
<tr>
<td>e. Personal Leave</td>
</tr>
<tr>
<td>f. Jury Duty</td>
</tr>
<tr>
<td>g. Other</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Statutory Payroll Taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. FICA</td>
</tr>
<tr>
<td>b. Federal unempl</td>
</tr>
<tr>
<td>c. State unempl</td>
</tr>
<tr>
<td>d. Workmen’s comp.</td>
</tr>
<tr>
<td>e. State IC claims</td>
</tr>
<tr>
<td>f. Other p/t taxes</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Purchased labor</td>
</tr>
</tbody>
</table>

| TOTAL HANDLING LABOR | $6,221,267 | $32,465,284 | $512,236 | $1,656,575 |
### Sample Comparison

<table>
<thead>
<tr>
<th>Firm</th>
<th>Firm B</th>
<th>Firm C</th>
<th>Firm D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Annual Warehouse Man-Hours</strong></td>
<td>421,460</td>
<td>1,082,990</td>
<td>49,578</td>
</tr>
<tr>
<td><strong>Total Handling Cost Per Man-Hour</strong></td>
<td>$19,181,564</td>
<td>$55,713,834</td>
<td>$1,175,839</td>
</tr>
<tr>
<td><strong>TOTAL HANDLING COST PER MAN-HOUR</strong></td>
<td>421,460</td>
<td>1,082,990</td>
<td>49,578</td>
</tr>
<tr>
<td><strong>Handling Rate</strong></td>
<td>$45.52</td>
<td>$51.68</td>
<td>$23.60</td>
</tr>
<tr>
<td>PER LINES SHIPPED</td>
<td>$6.86</td>
<td>$12.77</td>
<td>$47.46</td>
</tr>
<tr>
<td><strong>MONTHLY STORAGE RATE PER LINE SHIPPED</strong></td>
<td>$6.64</td>
<td>$3.34</td>
<td>$0.30</td>
</tr>
<tr>
<td><strong>Total Warehouse Gross Square Footage</strong></td>
<td>634,000</td>
<td>1,787,981</td>
<td>251,560</td>
</tr>
<tr>
<td><strong>Storage Cost Per Gross Square Foot</strong></td>
<td>$4,482,882</td>
<td>$8,566,121</td>
<td>$1,492,577</td>
</tr>
<tr>
<td><strong>Storage Cost Per Gross Square Foot</strong></td>
<td>$854,000</td>
<td>$1,287,000</td>
<td>$251,500</td>
</tr>
<tr>
<td><strong>Storage Cost Per Gross Square Foot</strong></td>
<td>$6.80</td>
<td>$6.86</td>
<td>$6.57</td>
</tr>
</tbody>
</table>
Benchmarks

1. Throughput:
   - Lines shipped per man-hour

2. Handling cost per line shipped
   - “Direct” handling expense divided by total annual lines shipped

3. Storage cost per line shipped
   - “Direct” storage expense divided by total lines
Contract Warehousing Agreement

1. Open book:
   - Help in developing budget
   - All bidders use common format

2. Benefits
   - Agreement on costs to be included
   - Original budget missing some important costs
   - Help with overhead & profit - cost separation
TO GET AN IDEA OF HOW VOLUME MAY NOT BE CORRELATED TO THE EFFORTS ASSOCIATED WITH A CUSTOMER, CONSIDER FAVORED FLAVORS…. 

FF has $\frac{700,000}{1,200,000} = 58.3\%$ of the volume done by EQ

However, they have . . . . . . . . . . . . . . . . . .

$\frac{55}{100} = 50\%$ of the handling hours

$\frac{6}{11.3} = 53\%$ of the orders

$\frac{3}{12} = 25\%$ of the warehouse mgmt visits

$\frac{2}{5.4} = 37\%$ of the computer hours

$\frac{76}{249} = 31\%$ of the customer contacts

$\frac{3}{18} = 17\%$ of the executive visits

$\frac{2}{12} = 17\%$ of the sales visits
"WE WILL SURELY SEE AN EFFECTIVE HEALTH CARE PLAN LONG BEFORE WE WILL EVER HAVE A USABLE WAREHOUSE COSTING APPROACH"

B. CLINTON
1994
End of Part 1

Tom Speh
Assessing Warehouse Operations

Presented by
Robert E. Murray
REM Associates of Princeton, Inc.
Primary Flows

*Within a warehouse business*

- Product flow
- Information flow
- Cost flow
Understanding Warehouse Operations

Purpose and value

- Objectives of warehousing
- Scope of operations
- Key elements of warehouse operations
- Function vs. value
Operations Review

What to look for and how to look

- Forecasting of workload
- Functions, tasks and activities
- Definition of operations
- Importance of functions
- Volume variability (normal vs. peak)
- Cost of activities
Operations Review

*What to look for and how to look (continued)*

- Time: Specific vs. cycle
- Labor: Touch vs. support
- Handling vs. storage
- Value-added services
- Control: Direct vs. indirect
- Key to review its logic
Mapping Operations

Detailed understanding of the process

- Receiving
- Storage
- Replenishment
- Assembly
- Checking
- Shipping
Key Elements Of Control

- Time
- Place
- People
- Planned activity vs. forecast
- Costs
- Direct vs. indirect
Assessing Operations

- Primary objective
- Basic functions
- Product flow
- Information flow
- Operations drivers
- Points of leverage
- Costs and value
Warehousing Alternatives

A realistic look at function & value

- Building size and shape
- Orientation and features (docks, etc.)
- Useable stack height
- Sprinkler and related requirements
- Security requirements
Warehousing Alternatives

A realistic look at function & value

- Building size and shape
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- Sprinkler and related requirements
- Security requirements
Assessing Space Utilization

*Key to building size, layout, and functions*

- Product storage requirements
- Storage equipment
- Utilization of cube
- Handling equipment
Assessing Space Utilization

Key to building size, layout, and functions (continued)

- Layout and flow
- Storage vs. productivity
- Docks – shipping and receiving
- Management of inventory
Location, Location, Location

Key to product storage

- Random storage
- Assigned slot
- Zone slotting
- Forward / reverse
- Picking levels
- Locator systems
Assessing Handling Effectiveness

Movement and flow

- Minimum handling of product
- Use of round trip (product storage and selection)
- Maximum handling effectiveness
- Elimination of bottlenecks
- Receive - store - replenish - select
Simplifying The Process

*Handle the product less*

- Reduce distances traveled
- Use of dock for storage
- Batch pick
- Zone pick
Wasted Movement / Wasted Storage

- Double Handling
- 80% Rule
- C’s & D’s
- FISH
Eliminate The Unnecessary

*Functions, tasks, and activities*

- Mapping warehouse activities
- Identify value
- Develop alternatives
- Evaluate realistic alternatives
- Implement change
Tradeoffs

Of handling and storage

- Information vs. product
- Capital vs. people
- Inventory management
Review Equipment

*For handling and storage*

- Requirements definition
- Equipment specifications
- Specifications vs. use
- “Great deals”
- Anticipated future changes
Activity Based Costing

- Cost elements vs. activities
- Examples of ABC
- Product costs
- Order costs
- Customer costs
- Management decision making
Options For Improvement

- Reduce handling
- Increased storage
- Reduced honeycombing
- Combined activities
- Eliminated redundancy
Operational Standards

Are they right for you?

- Measurements for functions, tasks, and activities
- Productivity improvement
- Individual vs. teams
- Management and reporting
Operational Standards

How to make the most out of labor

- Risk vs. reward
- Benchmarking functions
- Pay for performance
Effective Use Of Training

- Operations personnel
- Supervisory
- Warehouse and operations management
- Office vs. warehouse
- Training concepts
- On-the-job vs. classroom
Supervision

*Key to operational effectiveness*

- First line of defense
- Key to operations effectiveness
- Promote from within or without
Are You **World Class**?

- How to judge
- Where to look
- How to translate
- How to monitor and control
Case Study

- Introduction
- Process
- Teams
- Expected results
End of Part 2

Bob Murray