



Using Cost and Operational Data to Improve Warehousing Decisions



Presented by

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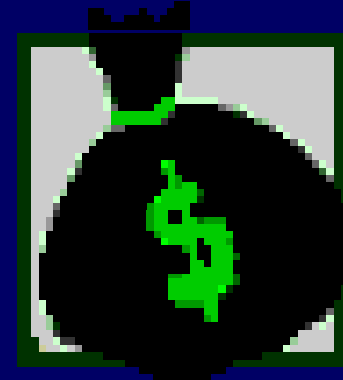
Bob Murray

REM Associates of Princeton, Inc.



Determining Total Warehouse Costs

Presented by
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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
- 




Introduction (continued)



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

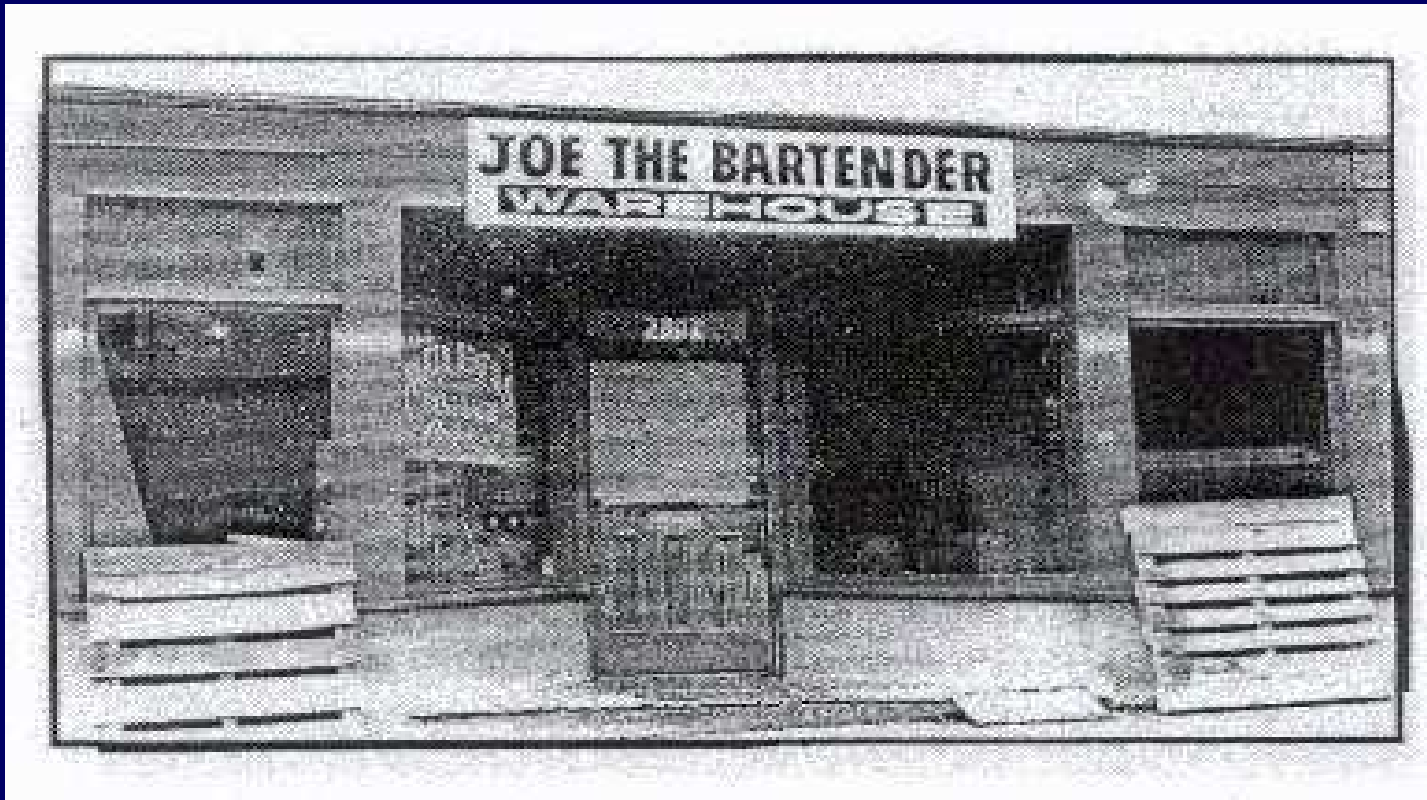
B. Model Creation

C. Model Refinement

D. Model/Diskette



Joe's Warehouse



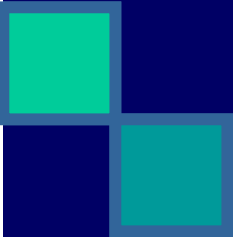



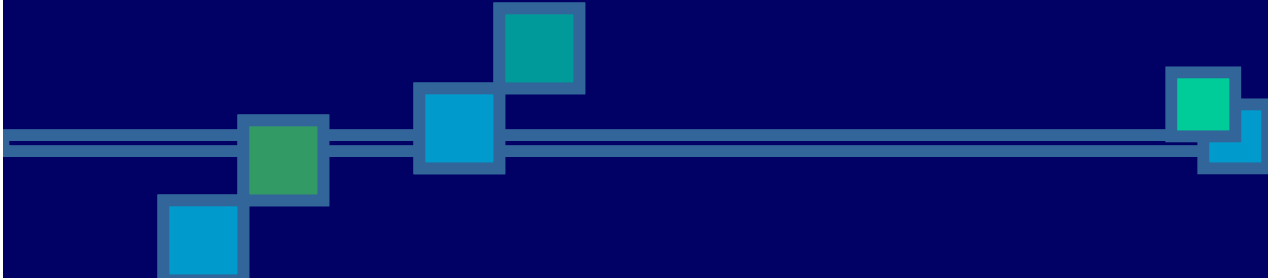
What We Learned From Field Research

- 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

Cost Item

Warehouse – MIS

Warehouse Maintenance

Warehouse Janitorial

Recoup

Charged To

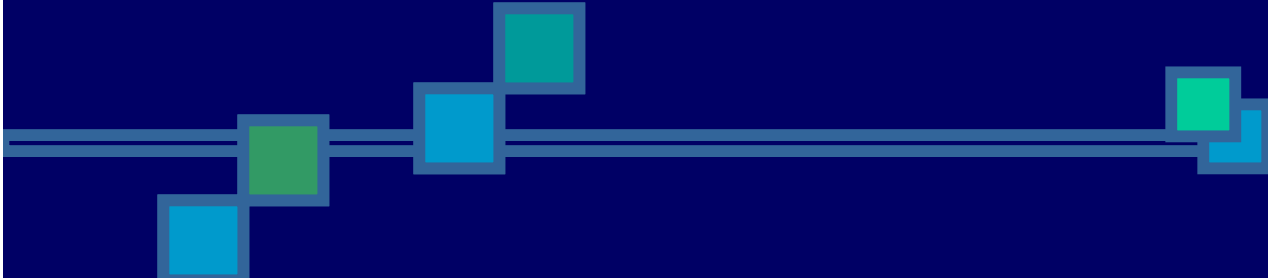
Corporate or Division

Plant or Divisions

Plant

Plant





The Research Showed (continued)



E. Examples of costs excluded from private warehouse cost centers

Cost Item

Warehouse Manager

Damage, Shrinkage

Depreciation, Taxes,
Insurances

Warehouse Office Salaries

Charged To

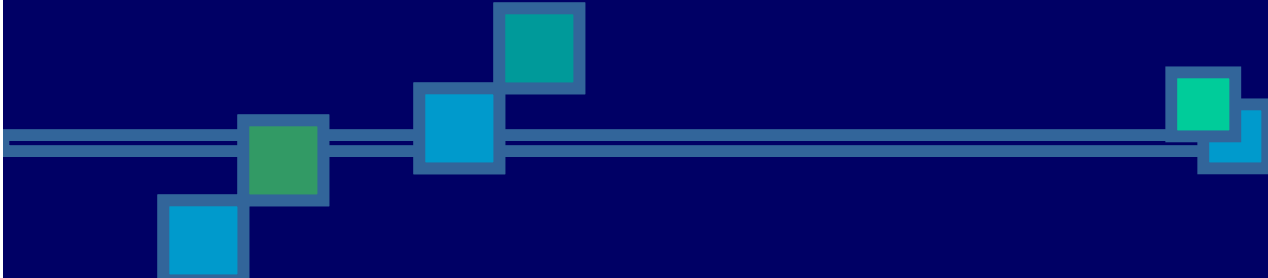
Garage & Traffic

Divisions or COGs

Divisions

Divisions





The Research Showed (continued)



E. Examples of costs excluded from private warehouse cost centers

Cost Item

Labeling, Shrink Wrap

Rent, Utilities

Corporate Logistics Support

Corporate Overhead

Charged To

Product

Divisions


Divisions


Divisions



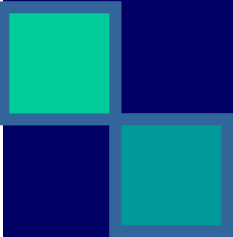



Conclusions From Field Research

- 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
- 

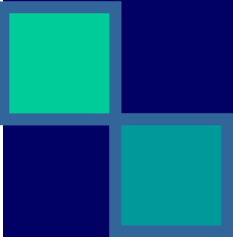

Harry M. Warner



“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

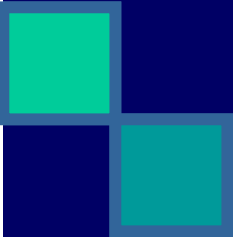
- A. Consider number of facilities
- B. Other functions, e.g. Transportation

2. Private


- A. Incremental
 - B. Would costs be "Eliminated" or "Reassigned" if the warehouse closed
- 



The Executive Salaries

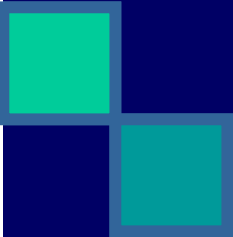


PUBLIC: This category includes the appropriate portion of payments to company officers and executives (excluding marketing). The elements included are salaries, bonuses, fringe benefits, compensated time-off and payroll taxes.






The Executive Salaries

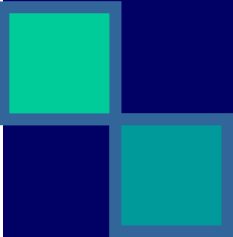


PRIVATE: This category would include "appropriate" allocations of payments to company executives and corporate office managers who devote some or all of their time to warehousing. The amount of allocation is company-specific and based on the logic of the situation existing at each firm. Personnel in 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
 - Reworking
 - Janitorial/sanitation work

 - Segregating warehouse damage
 - Q/A checking
 - Stickers
- 



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 warehouse users 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

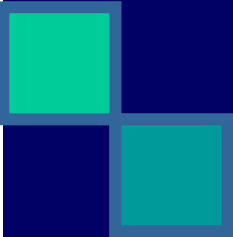

1. Rent or depreciation and interest
 2. Real estate taxes
 3. Insurance
 4. Exterior Maintenance
- 

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
- 

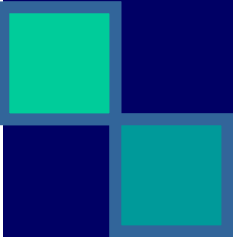



Operating Administrative Expense

- 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




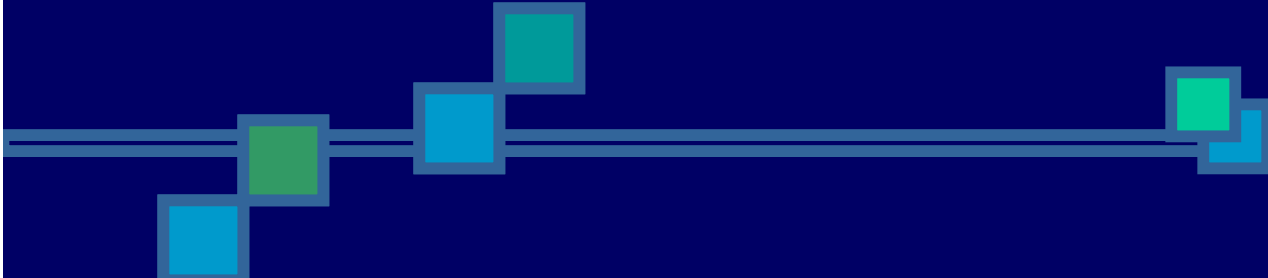
Travel Expense




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

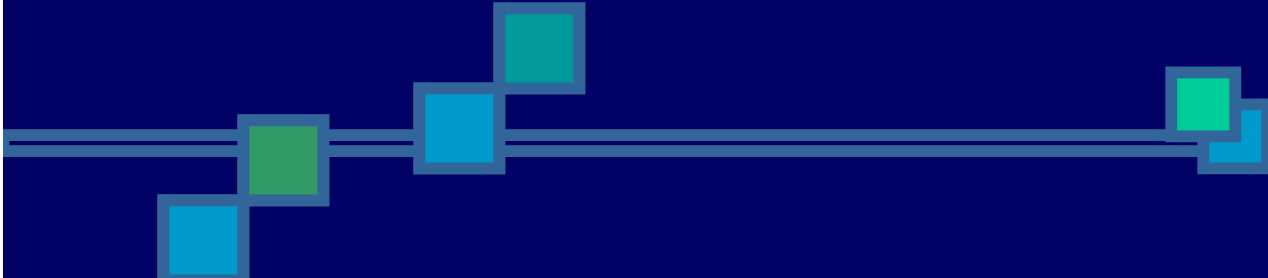
PRIVATE: This category would include the "appropriate" portion of corporate management and corporate logistics management travel expenses that relate to the private warehouse mission. If corporate office travel expense would be reduced or reassigned as a result of closing a private warehouse, the estimated 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.



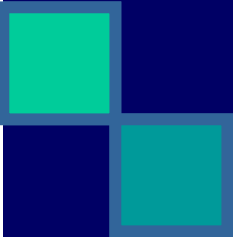




General Administrative Expense Elements

- 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



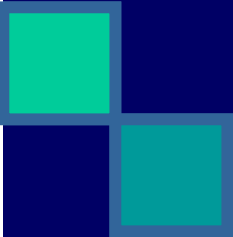



Flexibility In Use

- 
- 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

A. Warehouse Labor	WH 1	WH 2	WH 3	WH 4	WH 5
1. Direct Payments to Employees					
a. Wages	360000	0	400000	0	0
b. Bonuses	42000	0	52000	0	0
c. Overtime	32200	0	42200	0	0
d. Other	15000	0	15000	0	0
TOTAL	449200	0	509200	0	0
2. Compensated Fringe Benefits					
a. Health & welfare	68000	0	78000	0	0
b. Pension	24000	0	28000	0	0
c. Life insurance	25000	0	27000	0	0
d. Uniforms	1000	0	3000	0	0
e. Other	0	0	0	0	0
TOTAL	118000	0	136000	0	0
3. Compensated Time-off					
a. Vacation	10000	0	12000	0	0
b. Holidays	3000	0	3000	0	0
c. Funeral	2000	0	3000	0	0
d. Sick Pay	4000	0	5000	0	0
e. Personal leave	2000	0	2000	0	0
f. Jury duty	3000	0	4000	0	0
g. Other	6000	0	7000	0	0
TOTAL	30000	0	36000	0	0




Warehouse Labor



1. Direct payment to employees

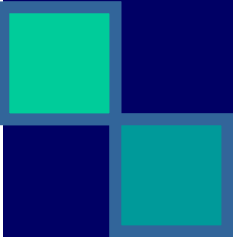

This category includes wages paid to warehousemen, including forklift operators, leadmen, working foremen, casual labor, part-time labor, janitors, and salvage labor.



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

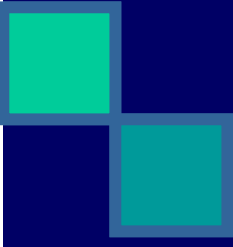
Handling expense per man-hour
Divided by
Throughput units per man-hour*

*Throughput units per man-hour = Total annual receipts
+Plus+
Total annual shipments
Divided by
2
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*



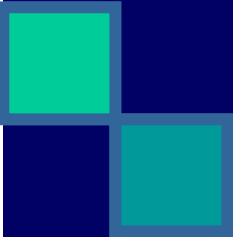

*Units stored per gross foot per month = peak inventory
during a month
Divided by
Gross square feet

Rate Samples

	<u>WHSE #1</u>	<u>WHSE #2</u>
VII. HANDLING "RATE" PER UNIT		
STEP A. Handling Cost Per Man-Hour from Handling Cost Calculation		
Cost per man-hour	32.000	27.351
STEP B. Estimated Thruput Units Per Man-Hour =		
	640	610
STEP C. Handling "RATE" Per Unit: =		
	32.000	27.351
	÷ 640	÷ 610
HANDLING "RATE" PER UNIT	----- 0.0500	----- 0.0448
VIII. STORAGE "RATE" PER UNIT		
STEP A. Monthly Storage Cost Per Gross Square Foot =		
	3.4450	3.5250
	÷ 12	÷ 12
	----- 0.287083	----- 0.29375
STEP B. Estimated Peak Monthly Inventory (in units) -		
	2300000	2300000
Divided by Gross Square Feet =	400000	400000
Units/Sq. Ft./Month (where units = CASES)	5.75	5.75
STEP C. Storage "RATE" Per Unit =		
	0.287083	0.29375
	÷ 5.75	÷ 5.75
MONTHLY STORAGE RATE PER CASE =	----- <u>0.0499</u>	----- <u>0.0511</u>



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.

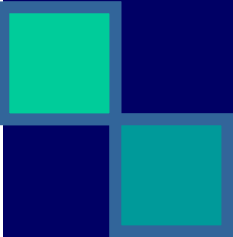

$$\begin{array}{r} \$ \\ \hline \text{Total Handling} \\ \text{Expense, STEP C,} \end{array} \quad \begin{array}{c} \times \\ \text{times} \end{array} \quad \begin{array}{r} \hline \text{Desired Profit} \\ \text{Percentage} \end{array} \quad = \quad \begin{array}{r} \$ \\ \hline \text{Profit Dollars} \end{array}$$

2. Profit Dollars + Total Handling Expense =
Total Handling Expense plus Profit

$$\begin{array}{r} \$ \\ \hline \text{Profit Dollars,} \\ \text{STEP D-1} \end{array} \quad \begin{array}{c} + \\ \text{plus} \end{array} \quad \begin{array}{r} \hline \text{Total Handling} \\ \text{Expense, STEP C} \end{array} \quad = \quad \begin{array}{r} \$ \\ \hline \text{Total Handling} \\ \text{Expense plus} \\ \text{Profit} \end{array}$$

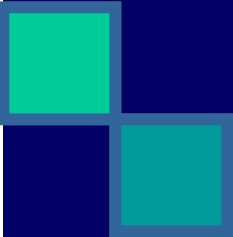



The Model: Diskette

- 
- A. Lotus 1-2-3 spreadsheet
 - B. Organization: "Cost calculation form"
 - C. Compare up to 5 warehouses on one screen
- 



The Model: Hot Spots

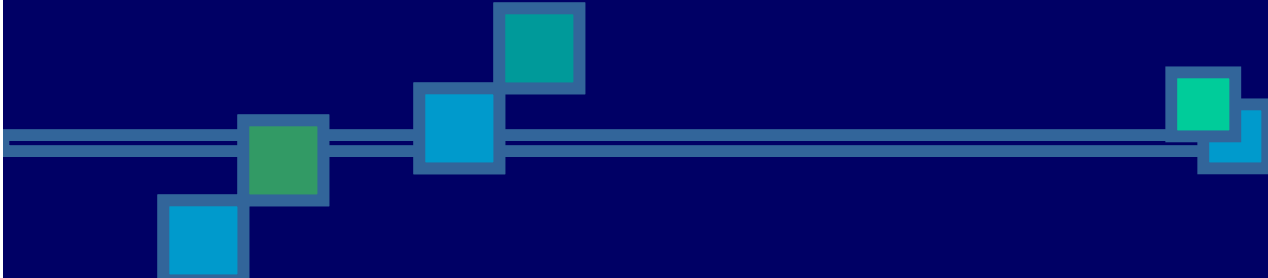
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- A. Separation of cost into handling & storage components
 - B. General and administrative expenses!!!
 - C. Data collection effort
 - D. Unavailable costs
 1. "Pass throughs"
 2. Depreciation, insurance, taxes, damage
- 

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
- 

Sample Comparison

WAREHOUSING COST CALCULATION FORM BENCHMARKING STUDY 1991


	<u>FIRM A</u>	<u>FIRM B</u>	<u>FIRM C</u>	<u>FIRM D</u>
I. HANDLING EXPENSE				
A. Warehouse Labor				
1. Direct Payments to Employees				
a. Wages	\$3,802,924	\$15,148,574	2205,006	\$1,169,469
b. Bonuses	\$141,328	\$365,711	\$0	\$0
c. Overtime	\$343,226	\$306,396	\$75,500	\$22,425
d. Other	\$0	\$0	\$0	\$4,226
TOTAL	\$4,347,478	\$15,820,681	\$350,506	\$1,196,110
2. Compensated Fringe Benefits				
a. Health & welfare	\$270,686	\$3,170,005	\$26,100	\$63,971
b. Pension	\$133,126	\$340,595	\$11,700	\$41,807
c. Life insurance	\$0	\$125,189	\$2,200	\$0
d. Unions	\$0	\$46,205	\$500	\$0
e. Other	\$340,210	\$72,487	\$0	\$0
TOTAL	\$744,022	\$4,754,981	\$40,500	\$107,484
3. Compensated Time-off				
a. Vacations	\$0	\$1,129,680	\$15,700	\$12,455
b. Holidays	\$0	\$405,339	\$12,300	\$36,367
c. Personal	\$0	\$25,585	\$0	\$0
d. Sick Pay	\$0	\$268,355	\$6,800	\$0
e. Personal leave	\$0	\$172,391	\$0	\$0
f. Jury duty	\$0	\$8,543	\$0	\$0
g. Other	\$509,472	\$1,205,757	\$0	\$0
TOTAL	\$509,472	\$4,708,165	\$32,400	\$106,830
4. Statutory Payroll Taxes				
a. FICA	\$0	\$1,352,146	\$18,200	\$49,757
b. Federal unemp.	\$0	\$22,835	\$1,200	\$19,025
c. State unemp.	\$0	\$416,863	\$1,800	\$0
d. Workman's comp.	\$0	\$305,318	\$16,200	\$17,220
e. State health	\$0	\$0	\$0	\$0
f. Other payroll taxes	\$560,893	\$0	\$0	\$0
TOTAL	\$560,893	\$2,387,256	\$36,200	\$145,936
5. Purchased Labor				
	\$0	\$0	\$14,400	\$0
6. Fees and Compensated Time				
a. Training	\$13,808	\$281,121	\$2,400	\$156
b. Education	\$0	\$0	\$0	\$0
c. Other	\$0	\$58,455	\$0	\$0
TOTAL	\$13,808	\$339,676	\$2,400	\$156
TOTAL HANDLING LABOR	\$6,201,367	\$27,486,284	\$402,200	\$1,566,576

Sample Comparison

	<u>FIRM A</u>	<u>FIRM B</u>	<u>FIRM C</u>	<u>FIRM D</u>
Total Annual Warehouse Man-Hours =	421,400	1,082,900	49,578	218,565
Total Handling Cost Per Man-Hour:				
	\$19,181,004	\$55,313,834	\$1,175,839	\$2,629,238
	421,400	1,082,900	49,578	218,565
TOTAL HANDLING COST PER MAN-HOUR	\$45.52	\$51.08	\$23.60	\$12.04
	45.52	51.08	23.60	12.04
HANDLING RATE PER Lines Shipped	\$6.81	\$15.77	\$47.40	\$10.35
	\$0.55	\$0.40	\$0.46	\$1.03
MONTHLY STORAGE RATE PER Lines Shipped	43.74	1.08	4.9761	1.25
	\$0.01	\$0.37	\$0.09	\$0.82
Total Warehouse Gross Square Footage =	674,000	1,787,061	251,500	215,000
Storage Cost Per Gross Square Foot				
	\$4,492,982	\$8,385,121	\$1,401,577	\$2,650,741
	\$674,000	\$1,787,061	\$251,500	\$215,000
STORAGE COST PER GROSS SQUARE FOOT	\$6.67	\$4.80	\$6.57	\$12.38



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 $700,000/1,200,000 = 58.3\%$ of the volume done by EQ

However, they have

55/100 = 50% of the **handling hours**

6/11.3 = 53% of the **orders**

3/12 = 25% of the **warehouse mgmt visits**

2/5.4 = 37% of the **computer hours**

76/249 = 31% of the **customer contacts**

3/18 = 17% of the **executive visits**

2/12 = 17% of the **sales visits**



President Clinton



**"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
- 



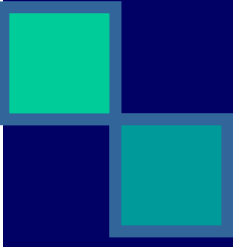

Mapping Operations

Detailed understanding of the process

- Receiving
 - Storage
 - Replenishment
 - Assembly
 - Checking
 - Shipping
- 

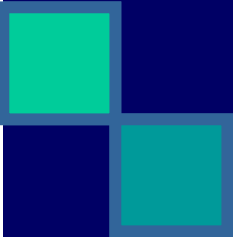



Key Elements Of Control

- 
- 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
 - Orientation and features (docks, etc.)
 - Useable stack height
 - Sprinkler and related requirements
 - Security requirements



Assessing Space Utilization

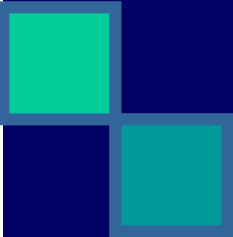


Key to building size, layout, and functions


- 
- 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

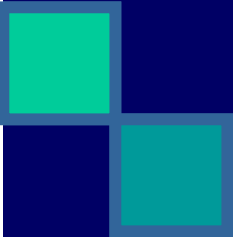



For handling and storage

- 
- Requirements definition
 - Equipment specifications
 - Specifications vs. use
 - "Great deals"
 - Anticipated future changes

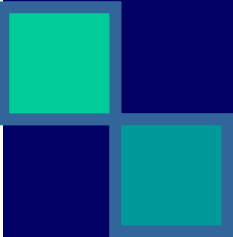



Activity Based Costing

- 
- 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

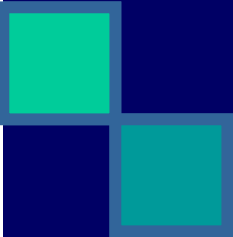



How to make the most out of labor

- 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

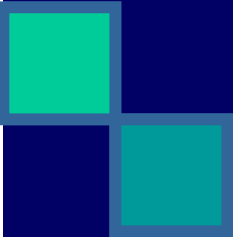



Key to operational effectiveness

- 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