
# Translating Cost Models from Excel into ACE

## *Best Practices and Lessons Learned*

**Sam Bresnahan**

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# Some Philosophy

*"Life is nasty, brutish, and short."*

— Hobbes, *Leviathan* (xiii), 1651

*"Cost models should be friendly, well-mannered, and long-lived."*

# What can I learn here?

- **General guidelines for translating cost models from Excel to ACE**
- **Specific ACE techniques**
  - Manage hardware configurations
  - Create lookup tables
  - Phase O&M costs
- **Excel-to-ACE lessons learned**

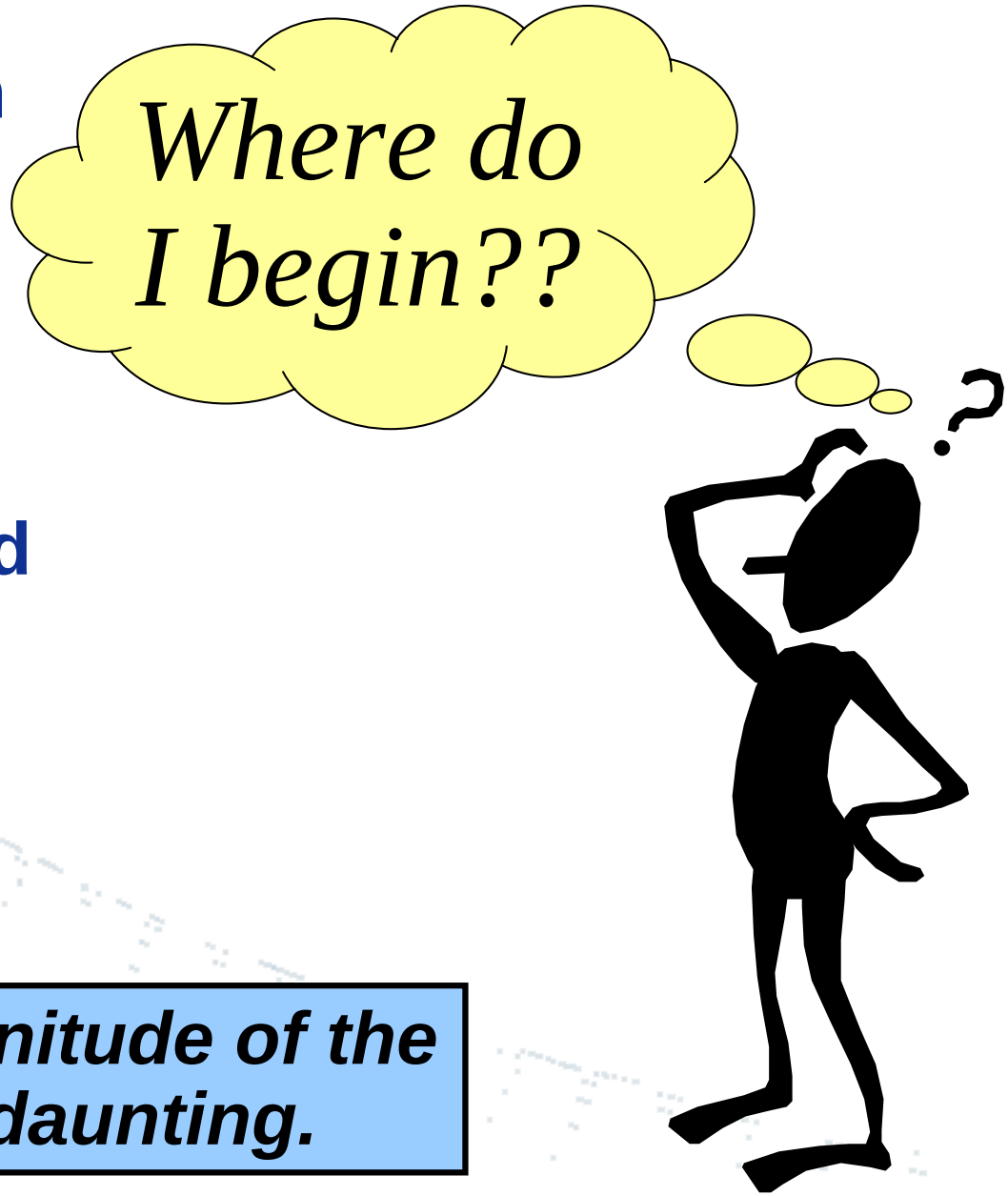
# Excel to ACE: General Guidelines

# The Case Study

- **Ship's Signal Exploitation Equipment Increment F (SSEE(F))**
  - SSEE(F) monitors and analyzes signals of interest aboard a variety of ship classes
  - Cost model must handle multiple hardware configurations
- **Task: Translate Excel model into ACE**

# The Problem

- **Excel cost models often contain dozens of worksheets**
- **Worksheets are often heavily cross-referenced**




***Sheer magnitude of the task is daunting.***

# About the Excel model

| Worksheet Function | Count |
|---|---|
| Cost elements | 45 |
| Reports | 4 |
| Other Input variables (learning curve slope, complexity factors, etc.) | 3 |
| Risk Analysis | 2 |
| Quantities (production, installation, fielded, defielded) | 1 |
| Change History | 1 |
| ***TOTAL*** | ***56*** |

***That's a lot of spreadsheet tabs.***

# One Approach

1. Make sure inflation indices are identical.
2. Replicate the WBS in ACE.
3. Replicate cost methodologies, starting with the cost drivers.
4. Compare ACE result to Excel result.
5. If results are close but not exact, check inflation calculations in Excel.

***Break the task into smaller pieces.***

# Specific Techniques in ACE

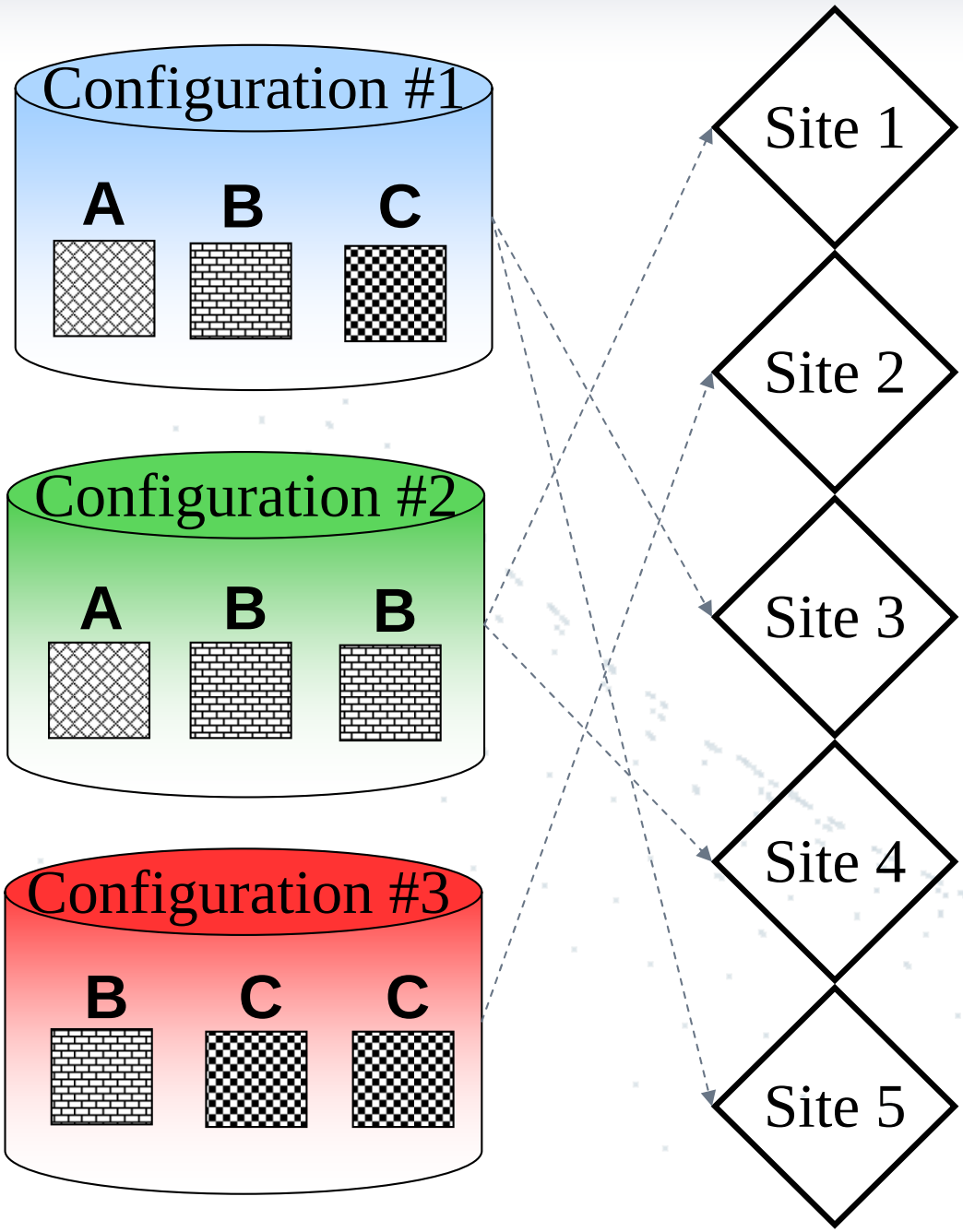
# Introduction

- **Some techniques that appear "easy" in Excel are not so straightforward in ACE for non-experts …**
- **… but it's definitely worth the trouble to learn!**
- **Specific ACE techniques**
  - Manage hardware configurations
  - Create lookup tables
  - Phase O&M costs

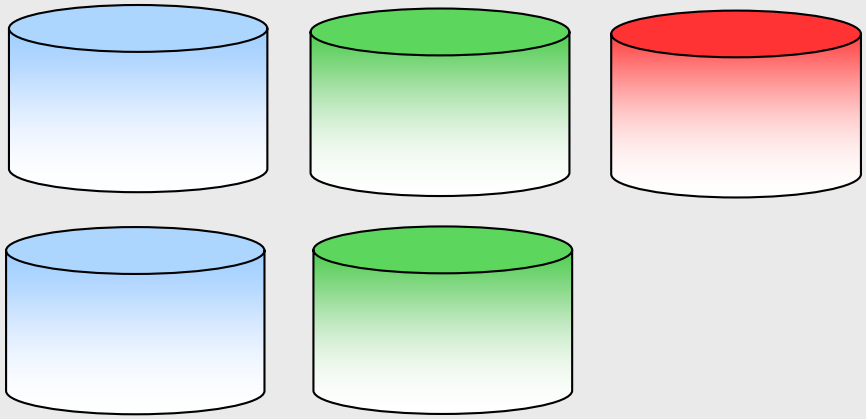
# Manage H/W Configurations

- **Problem: Manage multiple hardware configurations**
  - Deploy different configurations to different sites
  - *How do I track quantities for each configuration?*
  - *How do I track quantities for individual hardware items?*

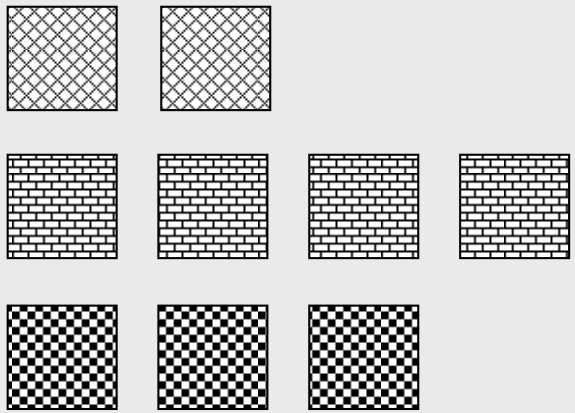
# Manage H/W Configurations




- **Count configurations**



- **Count hardware items**



# Manage H/W Configurations

- **Problem: Manage multiple hardware configurations**
- **Solutions:**
  - Use System By Site Wizard
  - Use DEC columns and SumIf( ) function to dynamically calculate costs
- **Pros and Cons to each approach**

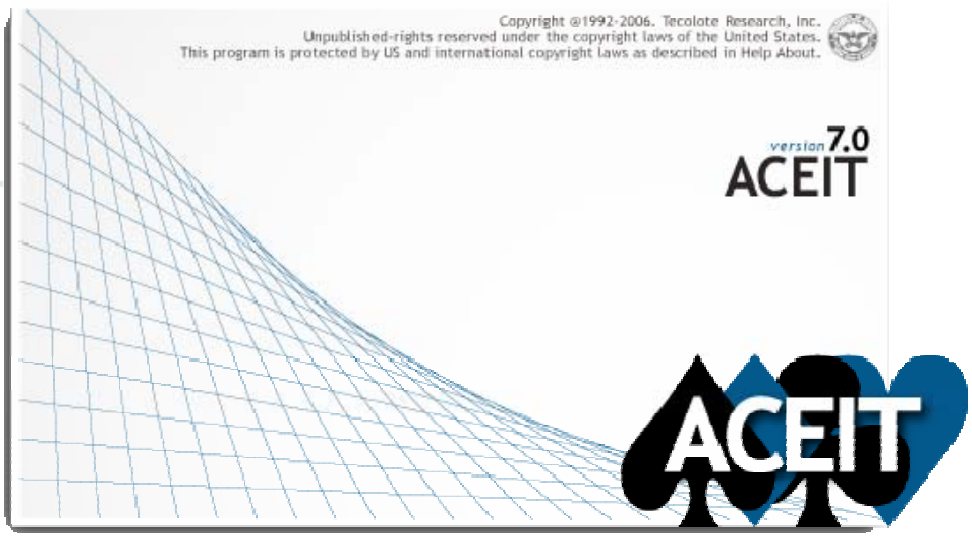
# Manage H/W Configurations

| Function | Manual Method | System By Site Wizard |
|---|---|---|
| Overall ease of implementation | HARDER | EASIER |
| Easy for another analyst to understand and modify | EASIER | HARDER |
| Quantity discounts | EASIER | HARDER |
| Count number of each configuration | EASIER | HARDER |
| Calculate cost of individual sites | HARDER | EASIER |
| Many different pieces of hardware | HARDER | EASIER |
| Many sites | EASIER | HARDER |

# Manage H/W Configurations

- **Manual Method – create four sections**
  - Site Deployment Schedule
  - H/W Unit Costs
  - H/W Configuration Matrix
  - H/W Lot Total Quantities

- **See ACE Demo**



# Model Quantity Discounts

- **Problem: Model Quantity Discounts**

- **Solutions:**
  - Create a lookup table in ACE (use for discrete quantities)
  - Use StepVal( ) function in ACE (use for ranges of quantities)

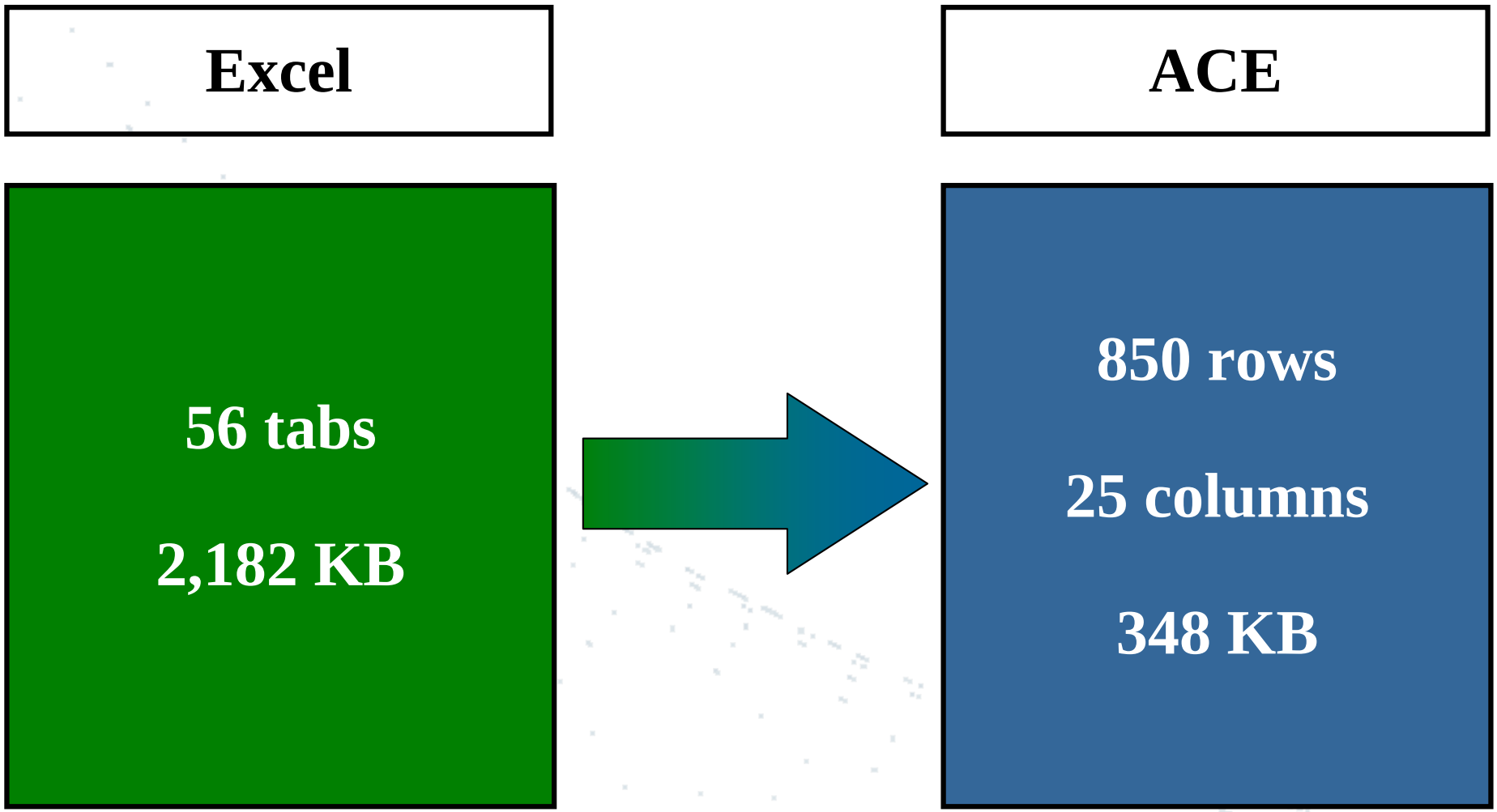
# Model Quantity Discounts

- **Lookup tables in ACE**
  - Simulate the HLOOKUP( ) and VLOOKUP( ) functions in Excel
  - Use relative row addressing
- **How to do it**
  - Create lookup table in Yearly Phasing Workscreen
  - Use FYCVal(@row + *n*) syntax to access lookup table, where *n* is an integer
- **See ACE demo**

# Excel to ACE: Lessons Learned

# Lessons Learned

- **SSEE(F) cost model**



# Lessons Learned

- **Most common error in Excel models: incorrectly applied inflation**
  - Out-of-date inflation indices used
  - Incorrect appropriation used
  - Inflation applied twice
  - Inflation not applied at all
  - Inflation applied incorrectly on parent rows that have child rows with different appropriations
- **12 out of 29 findings in SSEE(F) Excel model were inflation-related (about 40%)**

# Lessons Learned

- **One other common error: O&M costs phased incorrectly**
  - Annual fielded quantities tend to be “hard-coded” in Excel
  - If the buy schedule changes, fielded quantities are automatically out-of-date
  - Recommended approach: Use operational-life functions in ACE

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# Conclusions

- **Excel-to-ACE general guidelines**
  - Make sure inflation indices are identical
  - Start with cost drivers
- **Specific techniques in ACE**
  - Use SiteCost( ) function or manual method to manage multiple hardware configurations
  - Use relative row addressing or StepVal( ) function to implement lookup tables in ACE
- **Excel-to-ACE lessons learned**
  - Incorrectly applied inflation is the most common error
  - Pay close attention to O&M phasing; use ACE functions whenever possible