Cost Analysis: A Practical Approach

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Introduction

The primary objective in any DMSMS Obsolescence Management Tool is to:

Derive a cost effective strategy to mitigate the impact of obsolescence issues.

To assist the Sustainment Program Managers accountability for budget information, a Cost Analysis Module was developed.

This presentation covers a practical approach to estimating the cost to implement resolutions for part obsolescence before obsolescence occurs.
Cost Analysis Feature for AVCOM

**What is the Cost Analysis Feature?**

It is a comprehensive analytical add-on for AVCOM that analyzes a bill of material (BOM) and calculates the projected cost of sustainment.

**What does it do?**

It characterizes and augments a BOM with required attributes, characterizes the platform and end user so a program specific cost analyses can be produced.
Practical Approach

Our practical approach is to:

A. Categorize all parts on the Bill of Materials (BOM) with standard attributes and add additional attributes which will define a parts complexity.

B. Categorize the end user to:
   - Provide Program Detail
   - Assign a profile for DMSMS MGT level

C. Perform a risk assessment on the entire BOM. Select parts which are at risk of:
   - Going obsolete
   - Inventory depletion
Which Parts Do We Analyze?

Part Tracking requirements for each program can be quite different such as:

- Complete analysis of all parts
- Electronics only
- All parts except hardware and consumables

The Cost Analysis Module accommodates all part types entered.
Which Parts Do We Analyze?

The Cost Analysis Module automatically assigns:

- Probability of obsolescence values for each part
- Predicted availability for each part when this attribute is not imported

Probability and Predicted Availability default values can be changed by the user to accommodate internal polices or practices.

- A user may elect to use 6 years as a default for COTS instead of the default value.
- Software does not become ‘obsolete’ but we can assign the same availability on the software as the hardware it runs on.
Capture Resolution Implementation Costs

There are many sustainment costs associated with each program.

The Cost Analysis module will use either Statistical Costs or actual program costs as the lookup table.
Capture Resolution Implementation Costs

Capture non-recurring engineering cost elements which can include:

- Engineering, engineering data revision
- Purchase of engineering, design, or technical data
- Qualification of new items
- Revision of test procedures
- Software changes
- Startup costs (aftermarket, etc.)
- Testing
- Tooling, equipment, test equipment, or software
- Computer programs/documentation
- Interim support
- Supply/provisioning data
- Support/test equipment
- Technical manuals
- Training/trainers

Note: From SD22 January 2016 Table 10
Support Logistics Data

Support logistics data related to sustainment.

- Logistics related to Life-of-Need buys are monitored and included in formulas to identify issues through simplex consumption calculations.
Perform Analysis

Parts selected from the risk assessment will be identified. Two paths of are taken:

- Known Resolution
- Unknown Resolutions
The Cost Analysis Module uses Cost Tables:

- Default Cost tables have been created based on surveys and research from experts in the industry
- Defense Microelectronics Activity (DMEA) Cost Tables
- Custom Cost Tables (User Data)

The parameters required to select table and column are:

- Part criticality
- Packing density of the next higher assembly (NHA)
- Integration level of the part
- And whether the part requires requalification or not
Profiles

- Profiles – A profile is a column of resolutions and the percentage that user is expected to use each resolution based on user data or research data.

Three selective profiles are available:

- Default – Profiles derived from various defense institutions based on multiple analysis and research programs
- A DMEA set of resolution factors derived from the 2015 SD-22, *Diminishing Manufacturing Sources and Material Shortages* Guidebook
- Custom Profile: Policies and processes for implementing resolutions vary in each organization. In order to accurately capture those costs historical data from the user is used
Low Vs High Levels Of DMSMS Management

Highest Level of DMSMS MGT = Lower Cost Resolutions

Lowest Level of DMSMS MGT = Higher Cost Resolutions

Between Low 1 and Low 4 there has been as much as 50% Cost Savings
Report Generation

- Time period for the analysis – A start and stop date can be selected which will comprise the analysis period. Time Period can be:
  - The contract period
  - Platform Operating hours
  - Platform end of life remaining hours
Cost Analysis Processes

1. Categorize BOM (Bill Of Material)
   - Availability
   - Complexity
   - Requalification
   - Integration Level

2. Program Specific Data
   - DMSMS Profile
   - Inventory
   - Platform Type
   - Fleet Age, Size

3. BOM Analysis
   - Select Analysis Period
   - Risk Analysis
   - Inventory Analysis

4. Math Engine
   - Apply Cost Tables
   - Apply Profiles
   - Apply Factors

5. Output

Cost Analysis
Bill Of Material Sustainment Cost

This document consists of general information that is not defined as controlled technical data under ITAR Part 120.10 or EAR Part 772.
**Cost Analysis: Summary Report**

**Snapshot as of 04/13/2017**

**BAE Systems Proprietary**

**Client: Government Contractor**

**Reporting on - System: Small Military System**

**Cost Analysis**

<table>
<thead>
<tr>
<th>Current Sustainment Cost</th>
<th>5 Year Sustainment Cost</th>
<th>Recommended Refresh Cost Point</th>
<th>Total Sustainment Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>$562,094</td>
<td>$177,706</td>
<td>6 years</td>
<td>$3,735,702</td>
</tr>
</tbody>
</table>

*Cost To Resolve All Current Issues Through 2023 45% of Total Sustainment Cost Todays Snapshot*

**Top 5 Assemblies Contributing to Sustainment Cost**

<table>
<thead>
<tr>
<th>Assemblies</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>G203</td>
<td>$556,858</td>
</tr>
<tr>
<td>G2303</td>
<td>$501,277</td>
</tr>
<tr>
<td>G404</td>
<td>$385,821</td>
</tr>
<tr>
<td>G1206</td>
<td>$350,155</td>
</tr>
<tr>
<td>G909</td>
<td>$234,674</td>
</tr>
</tbody>
</table>

*Based on the systems life span.

**System Summary**

**Obsolescence Snapshot**

**Cumulative Annual Cost**

<table>
<thead>
<tr>
<th>Year</th>
<th>Cumulative Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>$552,284</td>
</tr>
<tr>
<td>2018</td>
<td>$577,546</td>
</tr>
<tr>
<td>2019</td>
<td>$602,476</td>
</tr>
<tr>
<td>2020</td>
<td>$626,430</td>
</tr>
<tr>
<td>2021</td>
<td>$650,481</td>
</tr>
<tr>
<td>2022</td>
<td>$674,532</td>
</tr>
<tr>
<td>2023</td>
<td>$698,583</td>
</tr>
</tbody>
</table>

**System Life Span Sustainment Cost**

**Note:** Cost includes; Cost to Manage Obsolescence, Engineering and Documentation Change Processes, Component Resolution, Solution Implementation, Part testing and validation as required.

**Note:** Cost does not include: Material Cost, MFG Cost, Repair and scheduled Maintenance.
Conclusion

Semiconductors become obsolete for many reasons and unfortunately once a product discontinuation notice has been issued:

• A small window exists to determine the most cost effective solution.
• Budget cycle from request to approval is a lot longer than that window.
• Based on surveys, expert judgment and research, a predictive Cost Analysis Module can supply information required for budget purposes.
• A cost prediction tool which could perform an analysis and identify inventory or availability issues in advance, would be essential to any program.
• **When used as part of a robust DMSMS program, cost prediction analysis can help supplement the program managers limited resources and budgets.**
Questions?
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