Raytheon
Procurement and Inventory Management System

Presented by:
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Presentation Road Map

- Company Overview
- Description of the Problem
- Analysis of Situation
- Description of Model
- Challenges Encountered
- Results
- Conclusions
Company Overview

• Raytheon runs many programs that need regular maintenance

• Clients depend on these programs and timely maintenance

• Raytheon purchases software packages from many vendors such as Adobe, Sun Microsystems and Oracle
Description of the Problem

• Raytheon does not have a well-organized way of tracking when programs need maintenance.

• Currently no common source for pulling information regarding the programs across entire company.

• Each department renews their own maintenance on their own schedule and has no way of communicating with other departments regarding scheduling.
Analysis of the Situation

- Network model using OPL Software interfaced with Excel spreadsheet
- 2 sets of 12 nodes representing the months of a year
- Flow is the dollar amount of yearly maintenance purchased
- Actual cost of purchasing the maintenance depends on the path the flow takes
Analysis of the Situation

- Current purchase schedule is the supply
- Flow can move from a month to adjacent months
- 6 discount arcs leaving each month
- Compile flow in individual months in order to reach a capacity level where it can take the arc with the least cost (the highest discount)
Four Month Example Network

\[ S_1 + S_2 + S_3 + S_4 \]
Objective

- Minimize
  Cost of moving purchases – Savings from discounts

  - Moving purchases from month to month incurs a cost of 1/12 the total amount moved

  - Discount arcs cost less than one
    - At 40% discount, costs .6 per 1 dollar of flow
Constraints

• Flow balance
  ▫ Supply in = Demand out

• Node balance
  ▫ Flow in = Flow out

• Only one discount arc per month can be used

• Capacity of discount arcs
  ▫ Flow volume must meet minimum requirements
Modeling for the General Case

- Model can be used with different data sets
- Each software package can be run individually
- Discounts can be easily changed
- Number of months can be increased to create a multiple year model
Assumptions

• Some programs are development programs only and will not buy multiple years of maintenance.

• Other programs are multi-year operational programs and would welcome multi-year maintenance agreements.

• All software packages must be maintained to keep programs functional.
Assumptions

• Volume discounts are supplier based and not based on individual products

• All expenses are for maintenance of software

• Cost per month of renewing or delaying purchasing is a percentage of yearly maintenance costs
### Example Data

Values in $K

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Challenges Encountered

- Unknown exact cost of delaying or renewing early
- Minimal opportunities to utilize these discounts
Project Results

- Savings of $90,170
- Savings could only be achieved on purchases of Sun Microsystems
- Additional Savings may be found with alteration of cost to move maintenance between months
Current Schedule

Optimal Schedule

Sun Microsystems
Conclusions

• More accurate data could turn out more substantial results

• Model can be expanded in the future to incorporate multiple year discounts

• Easily adaptable to other purchasing needs
Presentation Review

• Company Overview
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Questions?