

Raytheon Procurement and Inventory Management System

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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

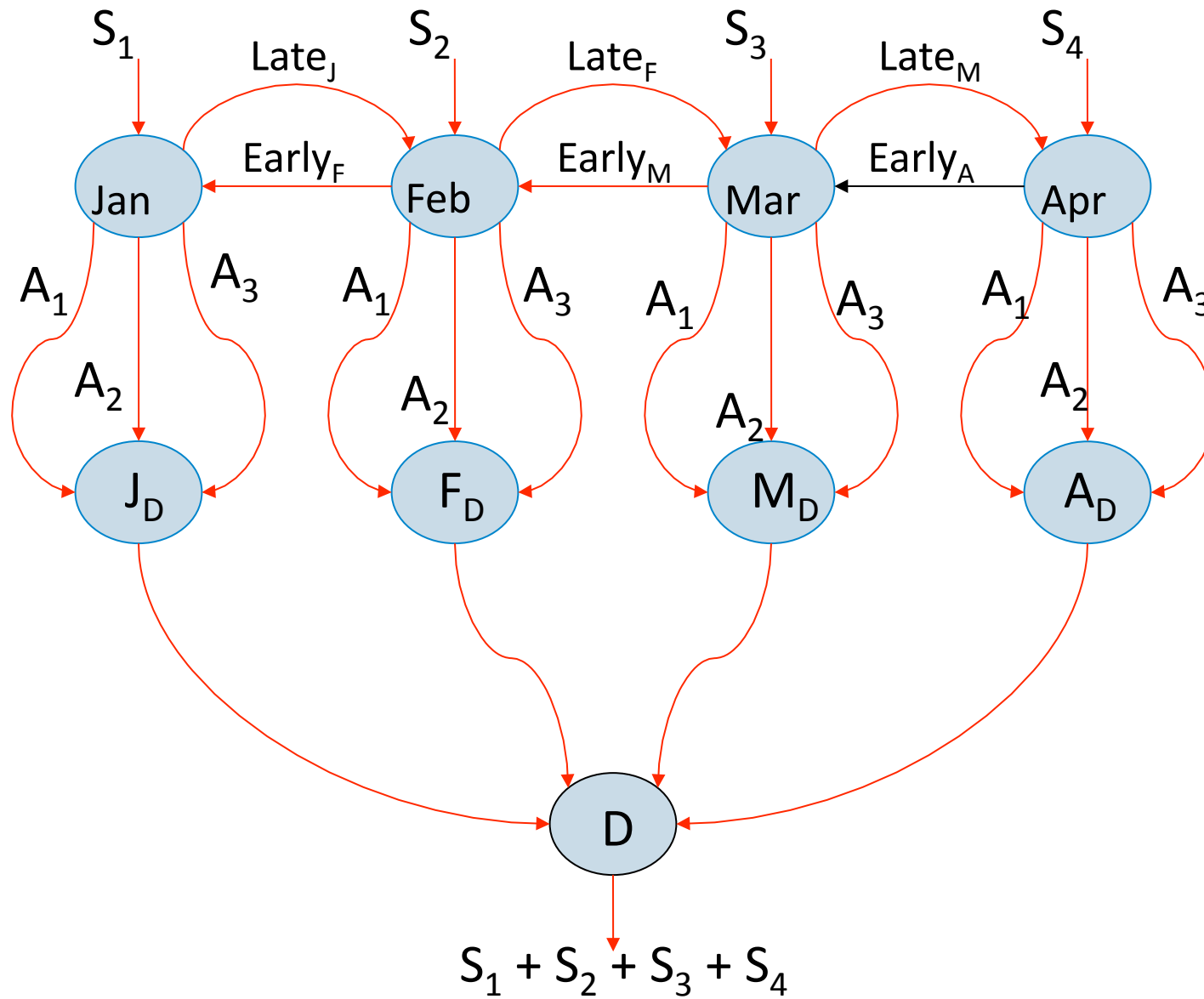
- Network model using OPL Software interfaced with Excel spreadsheet
- 2 sets of 12 nodes representing the months of a year
- Flow is the dollar amount of yearly maintenance purchased
- Actual cost of purchasing the maintenance depends on the path the flow takes



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



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

Months

Company Name	1	2	3	4	5	6	7	8	9	10	11	12	Totals
Adobe	7	0	5	5	5	0	5	10	5	0	5	0	47
Auspex Systems Inc.	0	4	0	11	0	0	0	0	0	0	0	0	15
C/S Solutions	0	5	0	2	0	0	0	0	5	0	0	0	12
Cisco Systems	60	50	0	30	50	120	0	0	58	100	18	10	496
Hewlett Packard	0	0	0	50	0	50	0	20	20	0	0	0	140
Fore Systems	1	1	0	0	0	0	0	0	0	0	0	0	2
Popkin	20	50	0	20	0	5	0	70	50	0	30	0	245
QSS	100	0	0	0	0	0	0	100	0	0	0	0	200
SAS Institute	0	0	0	32	0	0	0	0	25	0	0	0	57
Sun Microsystems	0	2000	0	0	0	10000	0	10000	5100	50	0	70	27220
Veritas	0	0	0	0	0	0	150	0	50	0	0	0	200

Example Data con't

Company Name	0-\$100K	Acquisition				
	% discount	>\$100K	>\$500K	> \$1M	>\$5M	>\$10M
Adobe	30	30	30	30	30	30
Analytical Graphics	5	5	5	5	5	5
Auspex Systems Inc.	25	25	25	25	25	25
Black and White Software	21	21	21	21	21	21
BMC	10	10	10	10	10	10
C/S Solutions	15	15	15	15	15	15
Cisco Systems	38	40	41	42	45	45
Hewlett Packard	10	10	10	10	10	10
Fore Systems	30	30	30	30	30	30
Fuji	10	10	10	10	10	10
ObjectSpace	20	20	20	20	20	20
Open Text	30	30	30	30	30	30
Oracle	33	33	33	33	33	40
Patuxent	16	16	16	16	16	16
Plaintree	25	25	25	25	25	25
Popkin	30	30	30	30	30	30
QSS	20	20	20	20	20	20
SAS Institute	20	20	20	20	20	20
Sun Microsystems	33	35	40	45	50	60
Veritas	30	30	30	40	40	45

Challenges Encountered

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

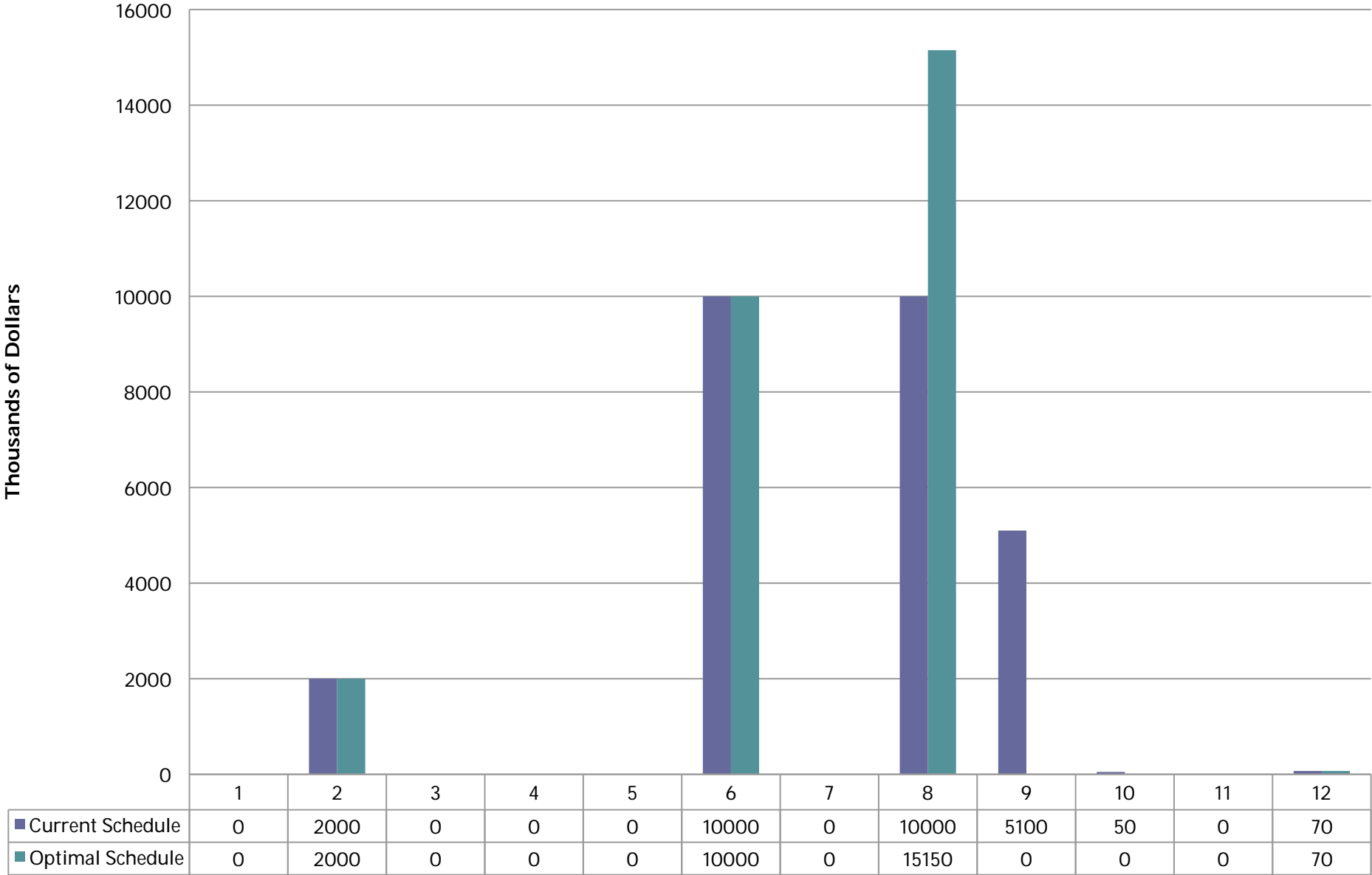




Project Results

- 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

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

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Questions?