



# TRUE PROGRAM SUCCESS '06

PRICE Systems U.S. Symposium  
April 19-21  
Sheraton San Diego Hotel & Marina  
San Diego, CA

**PRICE R&D Solutions**

**Bruce Fad**  
Vice President  
PRICE Systems, LLC



## Agenda

- > Agile Development at PRICE Systems
- > Product Development Roadmap Process
- > Products Integration

# Agile Development at PRICE

- > Agile Development Principles:
  - Priority is to satisfy the customer through early and continuous delivery of valuable software
  - Welcome changing requirements, even late in development
  - Deliver working software frequently, from a couple of weeks to a couple of months
  - Business people and developers work together daily throughout the project
  - Build projects around motivated individuals; give them trust and the environment and support they need
  - The most efficient and effective method of conveying information is face-to-face conversation
  - Working software is the primary measure of progress
  - Promote sustainable development to maintain a constant pace indefinitely
  - Simplicity--the art of maximizing the amount of work not done--is essential
  - The best architectures, requirements, and designs emerge from self-organizing teams
  - At regular intervals, the team reflects, then tunes and adjusts behavior accordingly
  
- > PRICE Implementation:
  - XP (testing at the foundation of development - TDD)
  - Initially 2-week iterations are now 1-week with customer walk-thru every other one
  - Retrospectives follow walk-thrus and include planning for next iteration

# Product Development Roadmap Process

- Roadmap is a rolling 24 month development plan – it too is agile

Theme:Feature:Story	2006 - Quangaroo			2007 - Crackoos				2008			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Pts / Iteration Avg	20	20	20	20	20	20	20	20			
Iterations / Release	5	5	5	5	5	5	5	5			
Total Points / Release	100	100	100	100	100	100	100	100			
Actual Points to Date	0	0	0	0	0	0	0	0			
Iterations Left this Release	5	5	5	5	5	5	5	5			
Points Left (as of today)	100	100	100	100	100	100	100	100			
Points Planned	107	107	114	104	75	70	10	20			
Net Balance	(7)	(7)	(14)	(4)	25	30		90			
<b>Enhance TruePlanner</b>											
Tighter Integration Excel											
Improvement to Scheduling											
Schedule Inputs View											
Improvements to Economics											
Knowledge Management in TruePlanning											
Customization											
Custom Name for each activity/resource and rollup on results tab											
Customer Issues / Usability											
Double Click and number of decimals on input sheet											
Calibration on an Input that is used in multiple Cost Object (ie Organizational Productivity)											
Need to know the name of the constant and then value where it has been applied											
Improve True IT & True S performance											
Software Estimating (True SICOCOMO)											
Infrastructure Estimating (True IT)											
TrueIT: Update Server Cost Generator with New Research											
Need Spread inputs based on Array type, not Demand Classification											
Complete a TrueAnalyst usable by Cost Modelers											
Phase I TrueAnalyst to Cost Research											
All ERD compliant catalogs default to have proper activity and resource pool attributes											
All ERD compliant catalogs forced to have proper activity and resource pool attributes											
Sustain PES											
PES: PRICE H/HL/M/S - Bugs and Customer Issues											
Execute Contracts CECM (4 FTE)											
CECM Contract											
OFCM Contract											
Task 2: Implement robust user roles											
Task 4: Create a configuration file for Admin											
General Availability of True H v1.0											
Hardware Estimating (True H)											
HW Comp - Generator Detailed Complexity - Input metric units											
Add WECF, Total Weight to the more results											
System of Systems / Hardware/Software Integration (True Universal)											
Universal Assembly											
PRICE Conversion											
BACKLOG											

Themes

Features

Stories



## Origin & Disposition of Themes, Features, & Stories

- > Where do they come from? The Directed Community:
  - PRICE customers (product, consulting, and contract R&D)
  - Prospective customers
  - PRICE consultants
  - Professionals in intersecting fields
  
- > Path from Backlog to Roadmap
  - Managed by PRICE Product Management
  - Decided by PRICE Configuration Control Board
  - Synchronized to the PRICE agile development process

# Products Integration

## > Early History

- PRICE with RDD 100 under RAASP (early to mid 1990s)
- PRICE with MS Excel (early to mid 1990s)
- PRICE with market basket of products under PSU ARL SBD (early 1990s)
- PRICE with MOCA under PASES (late 1990s)

## > Recent History

- PRICE with Performance Models thru Model Center under Northrop Grumman Design Impact Tool IRAD
- PRICE with Performance Models thru FiPER/ISight under ASRM & US Army IPCM



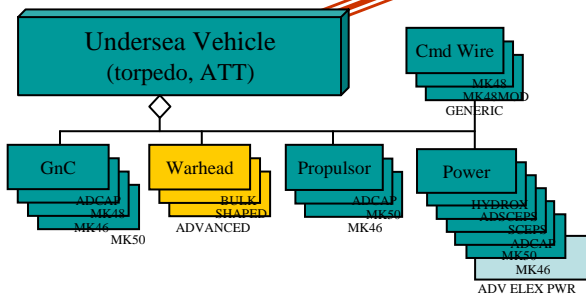
## Java-based GUI

- Runs on most computers
- Reconfigures based on information model



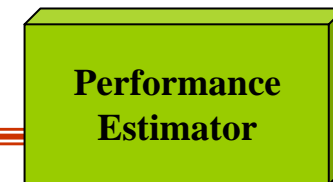
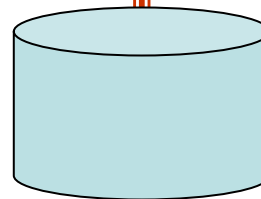
## Infrastructure

- Easily extensible
- Standards based (CORBA & STEP)
- Infrastructure building tools



## Design Servers

- Complete system synthesis
- Use ICAD generative modeling tool



## Performance Agent

- Torpedo engagement simulation
- Uses classified legacy software

## Cost Agent

- Parametric cost estimating
- Uses PRICE Enterprise

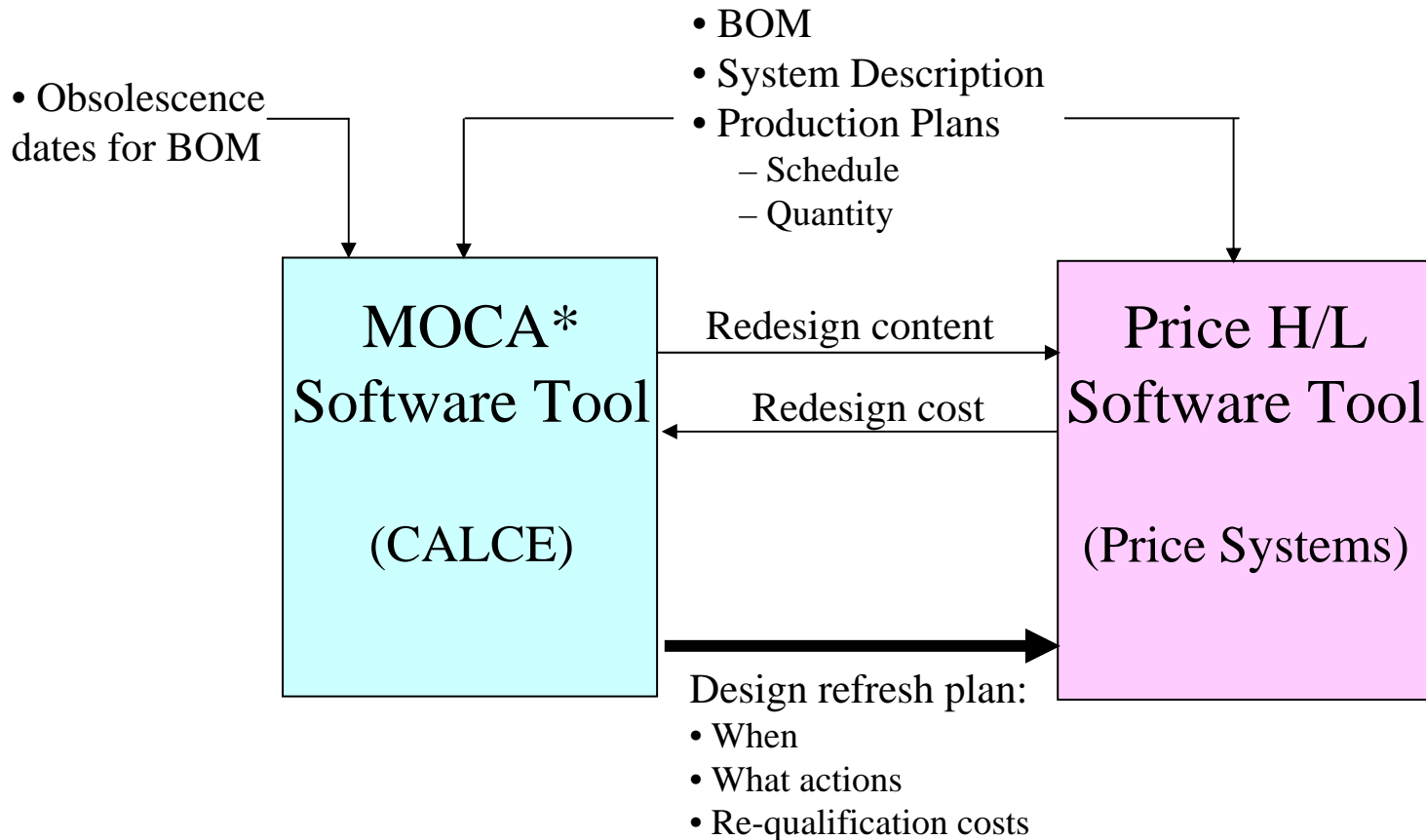
VehicleSpeed	60	55	60	55
Propulsion Length	37	37	29	37
Power Type	SCEPS	SCEPS	HYDROX	Electric-ALAGO
Endurance	1971	2660	1971	626.3
Warhead Length	34.5	34.5	42.42	34.5
Warhead Weight	64	64	79.09	64
Vehicle Weight	210.3	206.7	215.3	213.5
UPC (\$K)	181.1 K	177.9 K	263.8 K	212.3 K
Development (\$M)	7.53 M	7.47 M	8.35 M	7.91 M
Prod'n (\$M)	18.11 M	17.79 M	26.38 M	21.23 M
Total Cost (\$M)	25.65 M	25.26 M	34.73 M	29.13 M
Performance	<i>- Based on high fidelity undersea simulation -</i>			
Shots for 95% Pi (assumes independence of shots)				
Effectiveness ( \$/Intercept )	<i>- Directly shows cost per intercept comparison -</i>			

- Same endurance and max speed
- Different size power sections and costs
- Increased volume available for the warhead

*Does the lethality increase offset the higher cost?*



# Design Refresh Optimization Demonstration



MOCA – Mitigation of Obsolescence Cost Analysis

PASES - Physics of Failure Approach to Sustainable Electronic Systems



# NG Design Impact Model

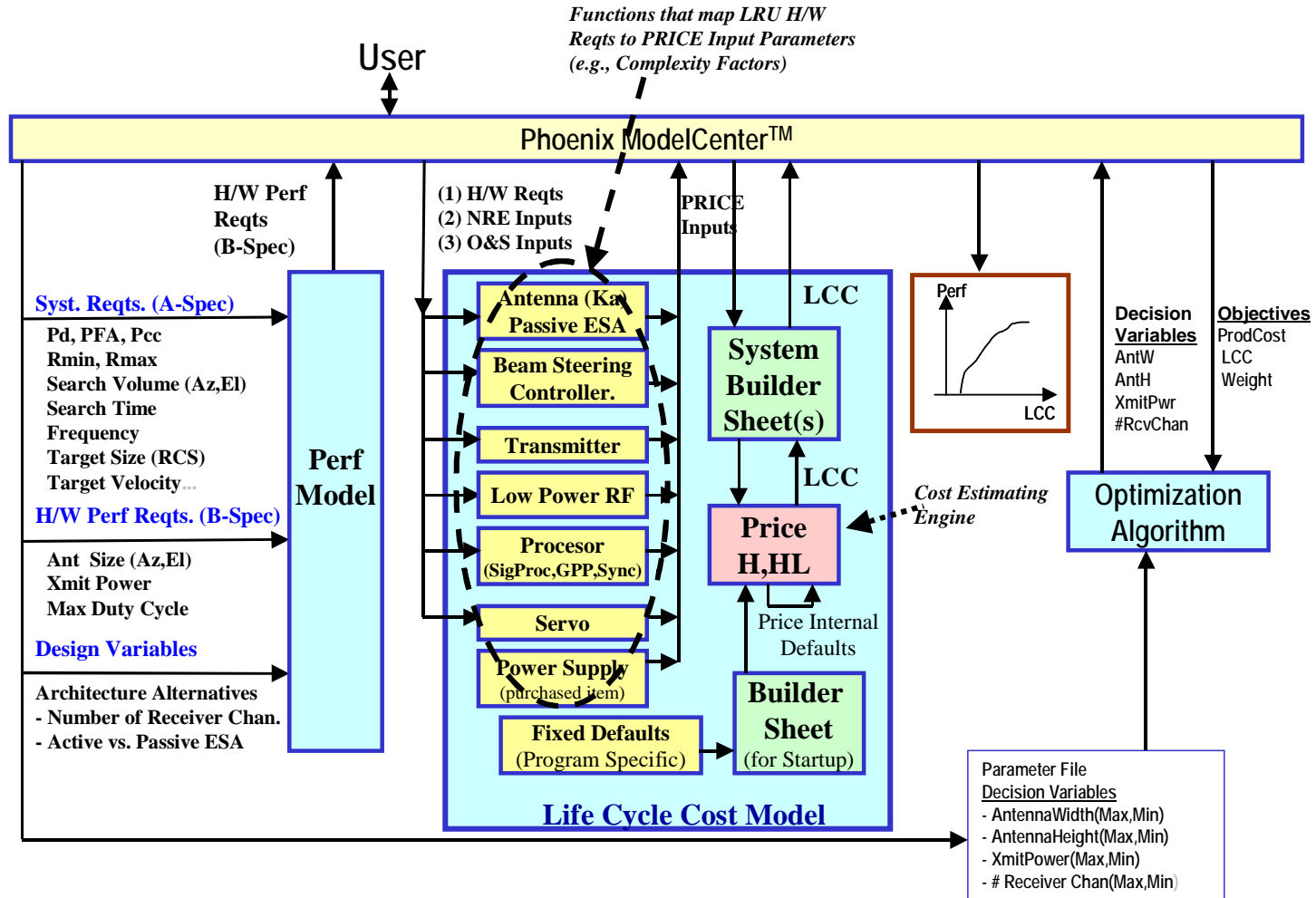
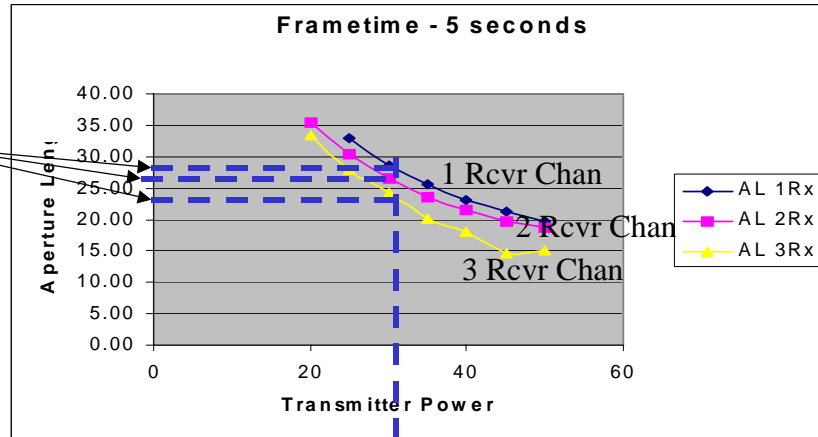


Fig ES-3 LCC Model maps Perf Reqs to PRICE

# NG Design Impact Model

For 5sec Frame Time

Best Value  
Antenna  
Lengths



Best Value Design Points  
that minimize LCC and meet Reqt

# RcvrChan	XmitPkPwr	AntLength
1	30Watt	28 inches
2	30 Watt	26 inches
3	30 Watt	24 inches

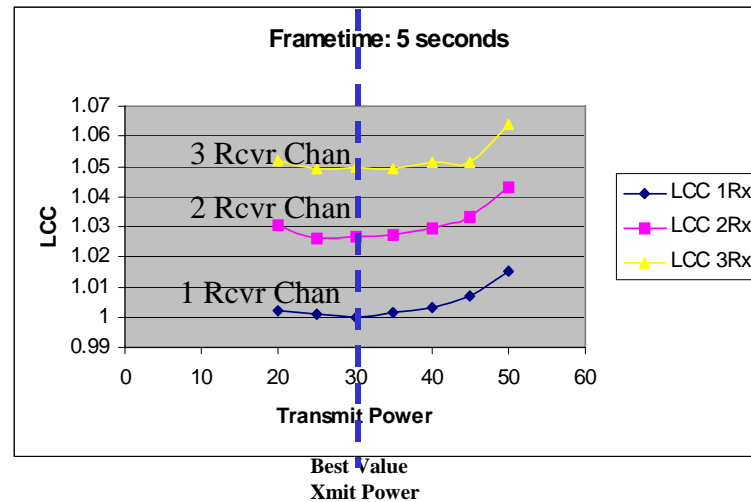
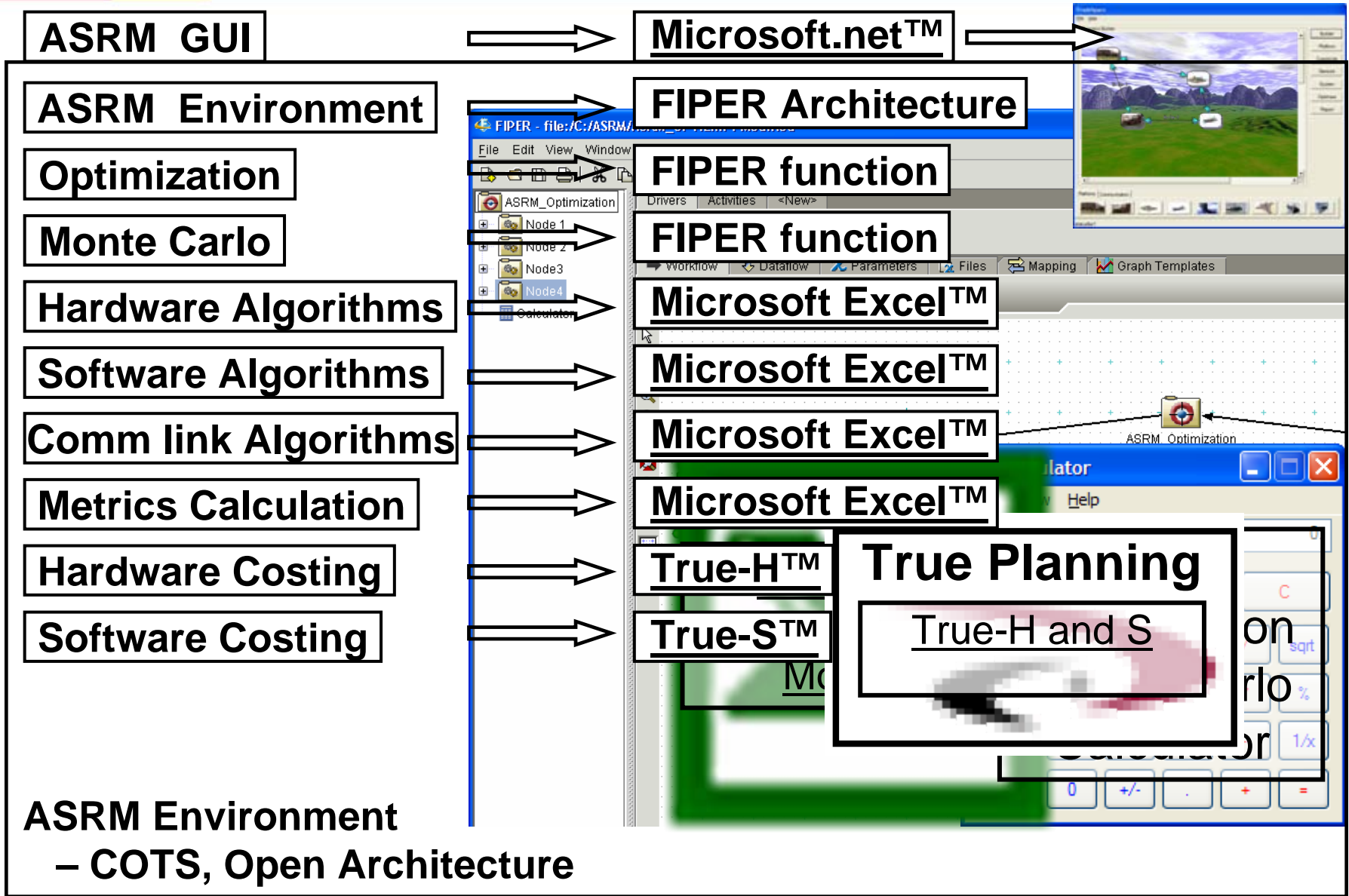


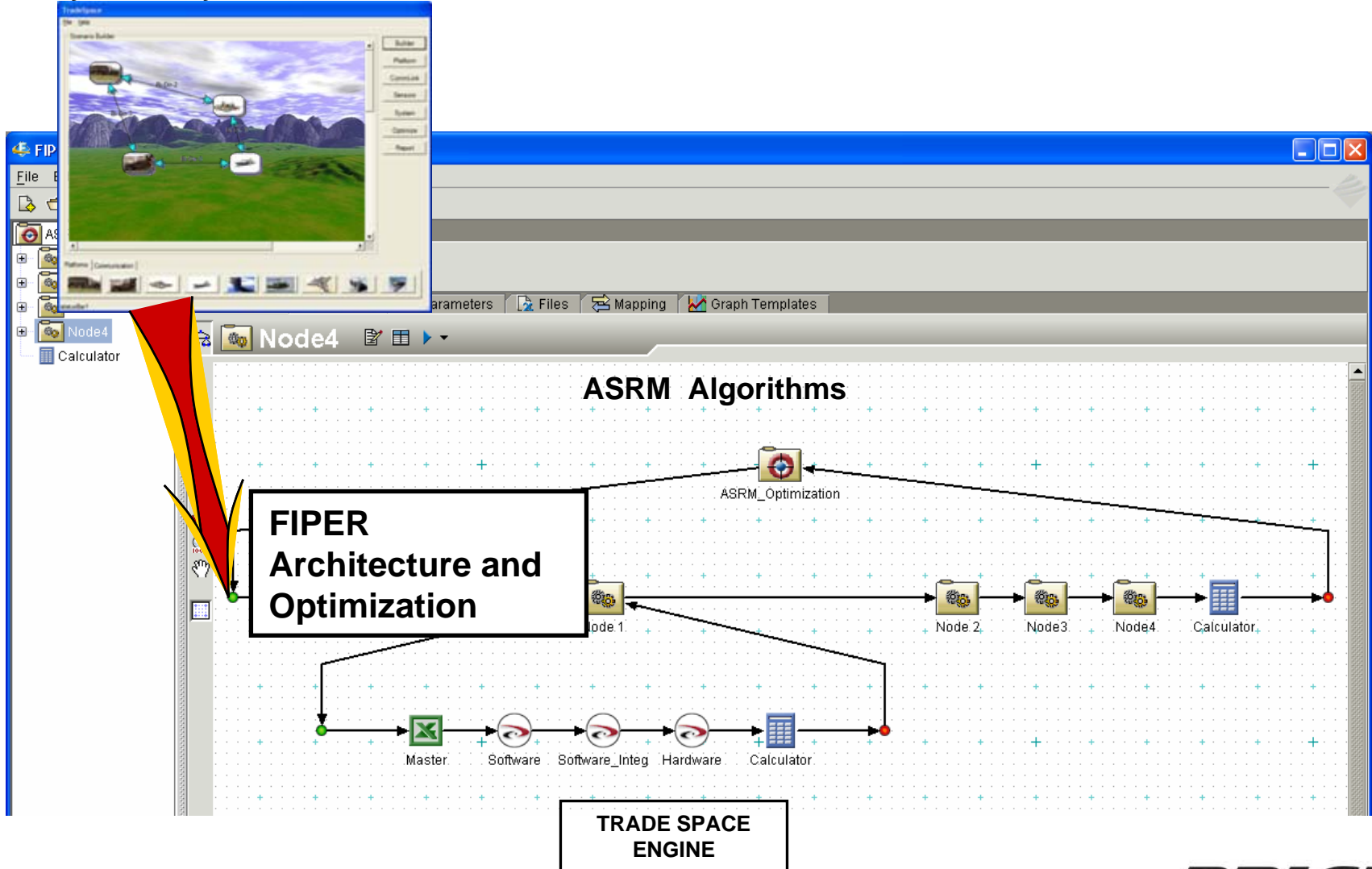
Fig ES-4 LCC Model gives visibility to Best Value Design





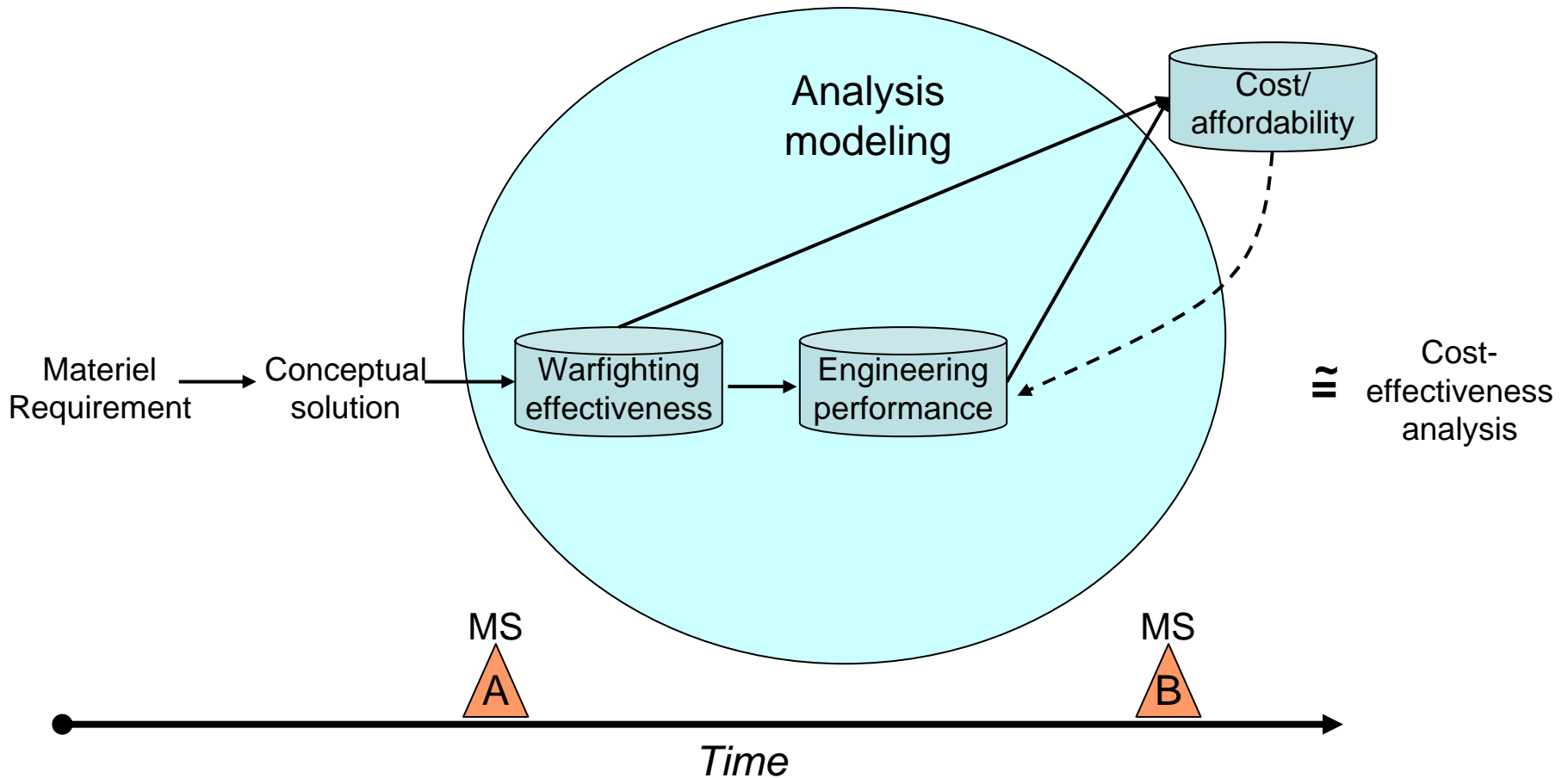
## System-of System Architecture

## ASRM GUI



# Why IPCM?

- Current acquisition analyses are sequential, stovepiped
- Cost is often considered too late, if at all



## Integration Common Thread

- > Affordability Simulation - Mathematical modeling to predict the likely cost of something on the basis of performance cost drivers
- > Seeking Best Value Decisions

# PRICE Product Integration Session

- > Phoenix Integration
  - ModelCenter and PRICE combine on Boeing Heavy Lift Program
- > True S COTS Integration
  - Challenges of estimating COTS Software
- > Affordability Simulation
  - Engineous and PRICE combine to deliver ASRM/IPCM
- > TruePlanner – Integration Framework
  - Hardware and Software Integration to address SoS
  - Integrating excel models
  - TrueConcepts
  - True COSYSMO
  - ACEIT

