Enhancing ACEIT Capabilities with the Joint Integrated Analysis Tool (JIAT)

5th Annual ACEIT User Workshop
February 1-2, 2011

Introduction to ACEIT and JIAT

- ACEIT provides a full suite of tools to assist cost analysts with the mechanics of analyzing data, building documented cost models and exploring what-ifs.
- When using ACEIT the major challenges for the cost analyst are:
  - ✓ Identifying relevant source data (analogous systems)
  - ✓ Collecting cost, technical, and schedule data
  - ✓ Developing or finding relevant CERs and factors
  - ✓ Finding and using appropriate cost/engineering models
  - ✓ Identifying inputs to uncertainty analysis

JIAT provides assistance with these challenges

JIAT and ACEIT Together

Use JIAT and ACEIT Together as a Powerful Tool-box

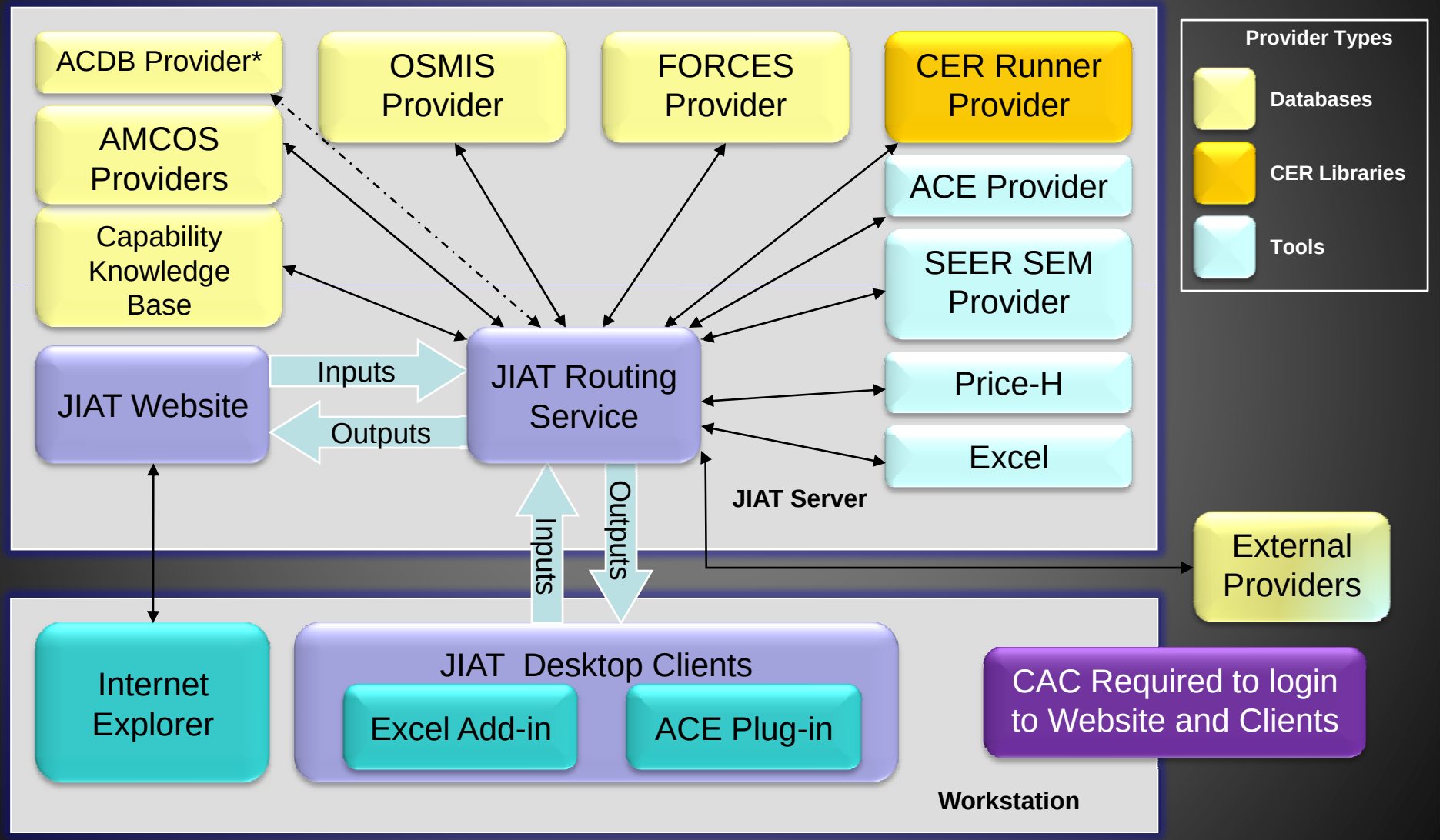
- Controls access to:
  - Databases
  - CER Libraries
  - Models
  - Estimating data
  - Model Sequences

JIAT is for DoD Analysts Only

ACEIT
Automated Cost Estimating Integrated Tools

- Analyze data sets with CO$TAT
- Develop estimates, models, AOAs, and CBAs with ACE
- Run what-if drills in ACE or POST
- Report on estimate results with ACE or POST

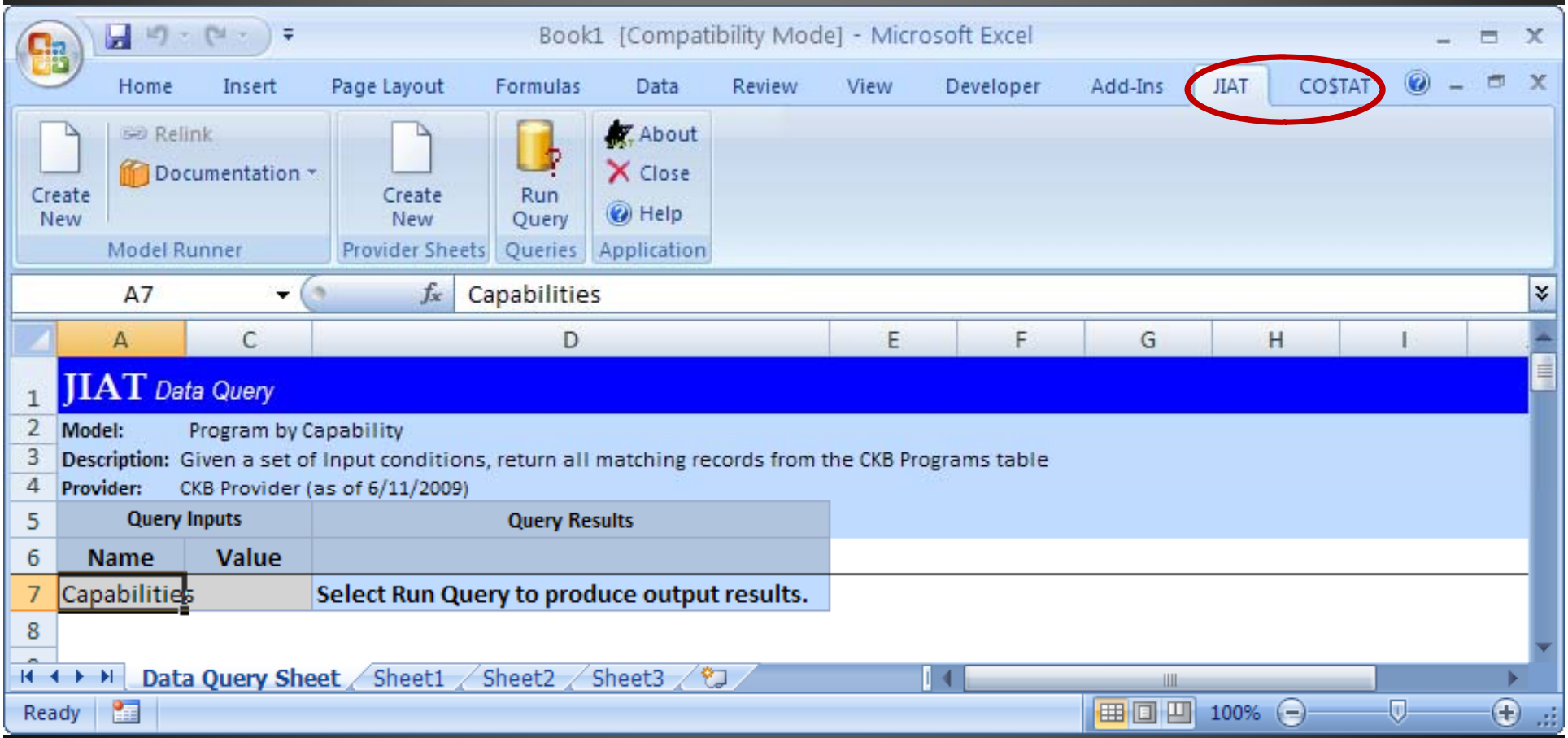
JIAT 2.1 Components



*** Currently only one sample ACDB database is hosted – Army databases are scheduled to be supported in JIAT 2.2 in Sep 2011**

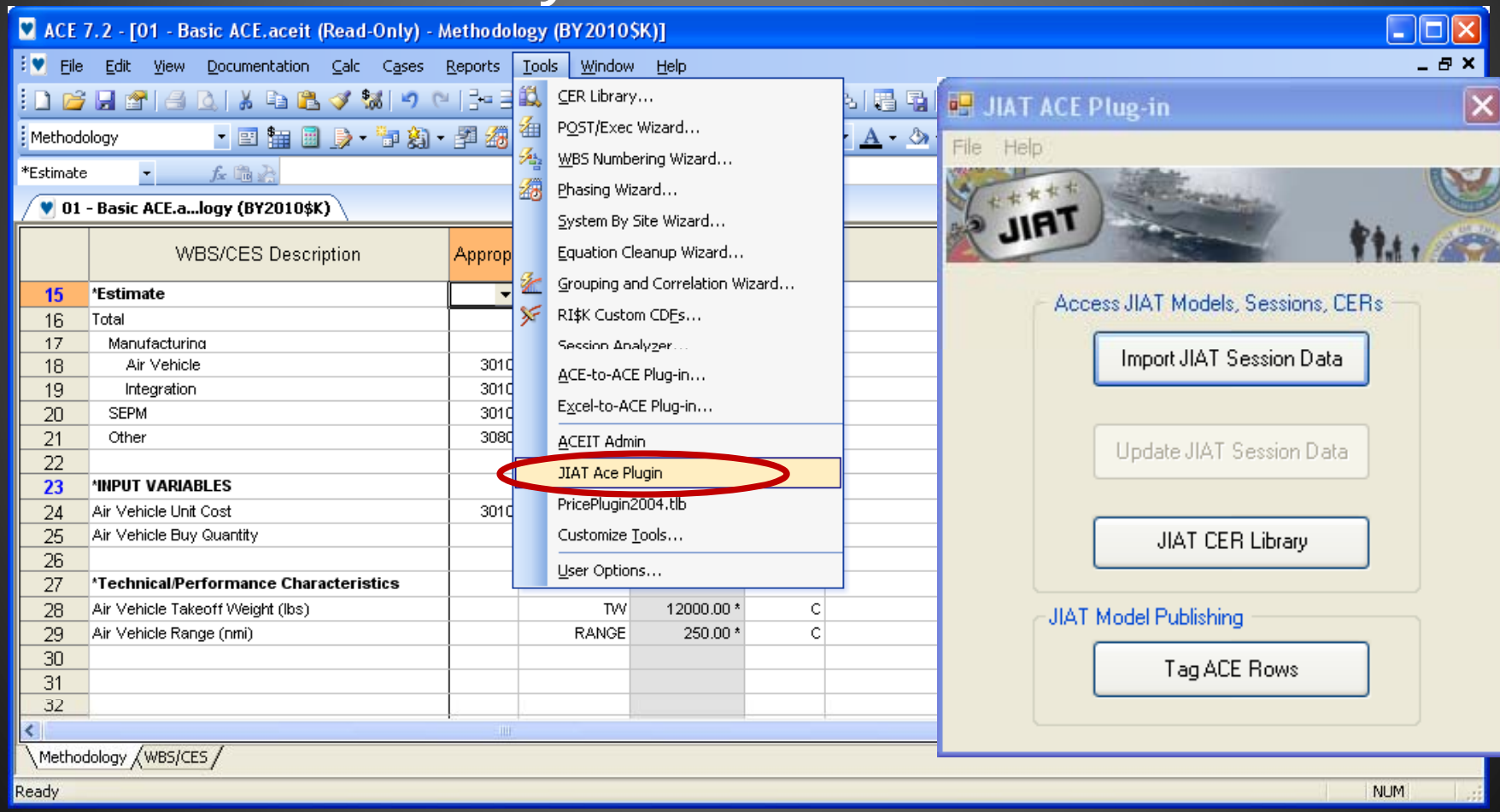
Working with the JIAT Desktop

- Use the JIAT Excel Add-in to access JIAT and CO$TAT at the same time



Working with the JIAT Desktop

- Use the JIAT ACE Plug-in to bring JIAT content directly into ACE



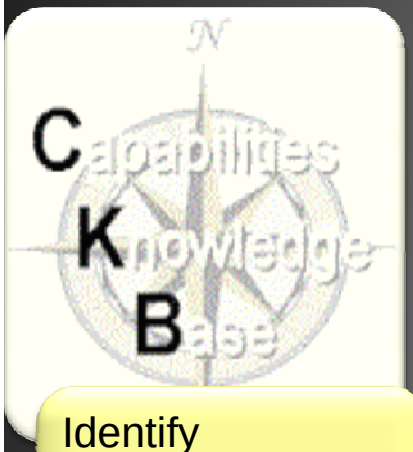
Using JIAT and ACEIT Together

- Main features in this presentation
  - ✓ Using JIAT to identify relevant analogies
  - ✓ Retrieving program data to use in a model or CER development
  - ✓ Developing CERs or factors with CO$TAT
  - ✓ Searching for CERs from JIAT libraries and importing them directly into the ACE session
  - ✓ Analyzing data obtained through JIAT to develop uncertainty distributions

- Other features discussed
  - ✓ Using ACEIT Inflation Utility to normalize data sets
  - ✓ Creating private CER and factor libraries for your organization
  - ✓ Setting up ACE sessions to host on JIAT
  - ✓ Running ACE models in the JIAT Excel Client
  - ✓ Importing model results from JIAT-hosted models into your ACE session
  - ✓ Creating Model Sequences

Current JIAT Database Providers

- JIAT provides access to Army databases

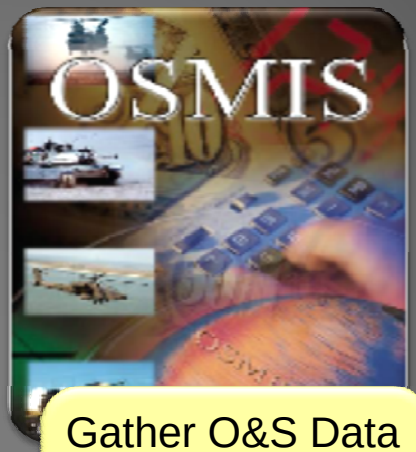


Identify Analogous Systems

- Capabilities
- Programmatic data
- Technical data
- Schedule data
- SAR data

Collect Standard Rates

- Enlisted
- Officer
- Civilian
- National Guard
- Reserve
- 17 tables provided



Gather O&S Data

- Vehicle operational data
- Support systems data
- Aircraft flight data
- Software maintenance data

Obtain Force and Organizational Data

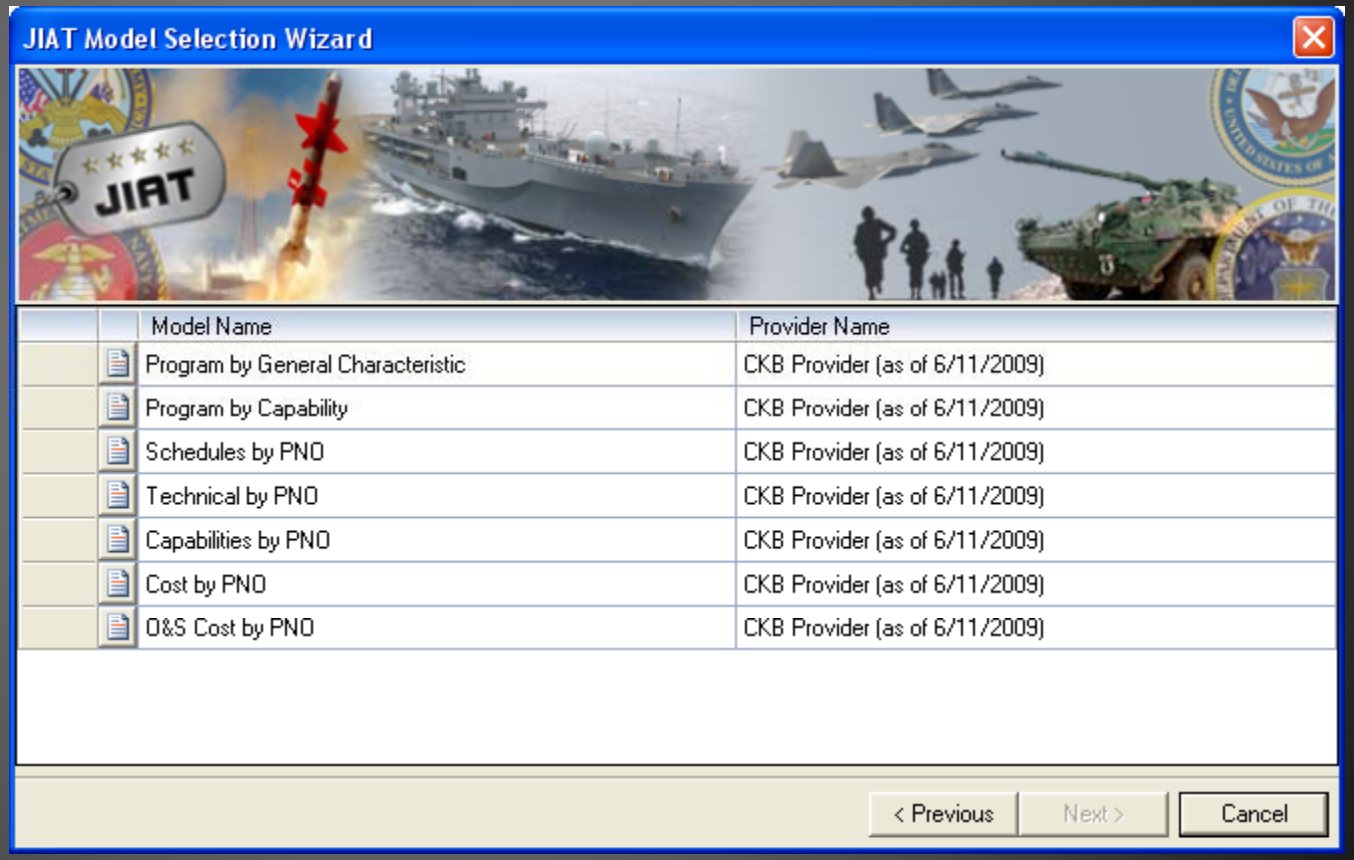
- Flying costs
- Cost per mile
- Facilities costs
- Equip data and costs
- Replenishment costs
- Mileage
- 50 tables provided

Search and Retrieve Data

Quickly find Analogous Systems Using JIAT

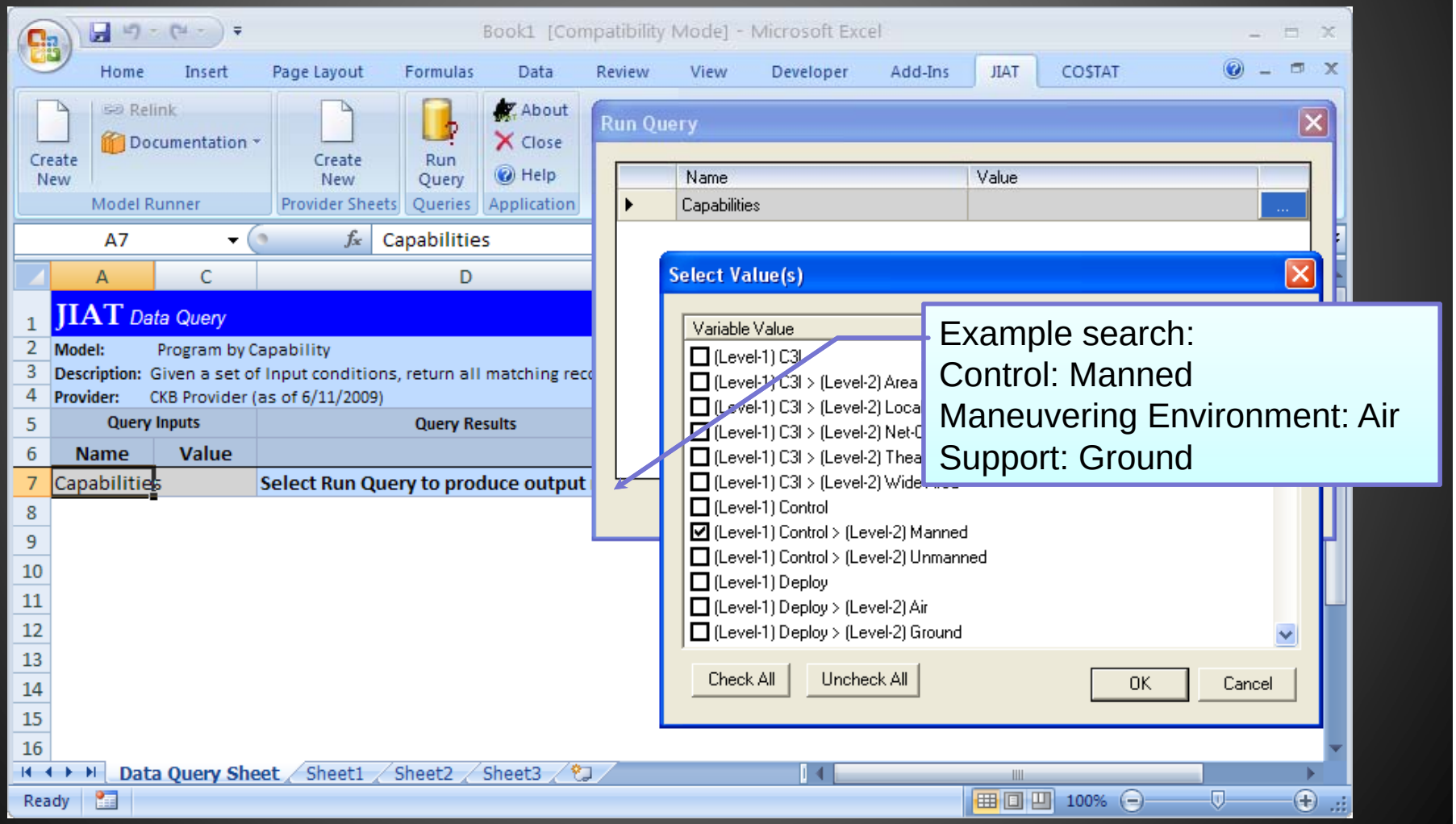
Use the CKB Provider to identify analogous systems and gather cost, technical, and schedule data for pre-Milestone A analysis

- An analogous system provides a starting point for all other data gathering activities
- Perform program searches by capability
- Retrieve analogous program's cost, technical, and schedule data
- CKB reports SAR data



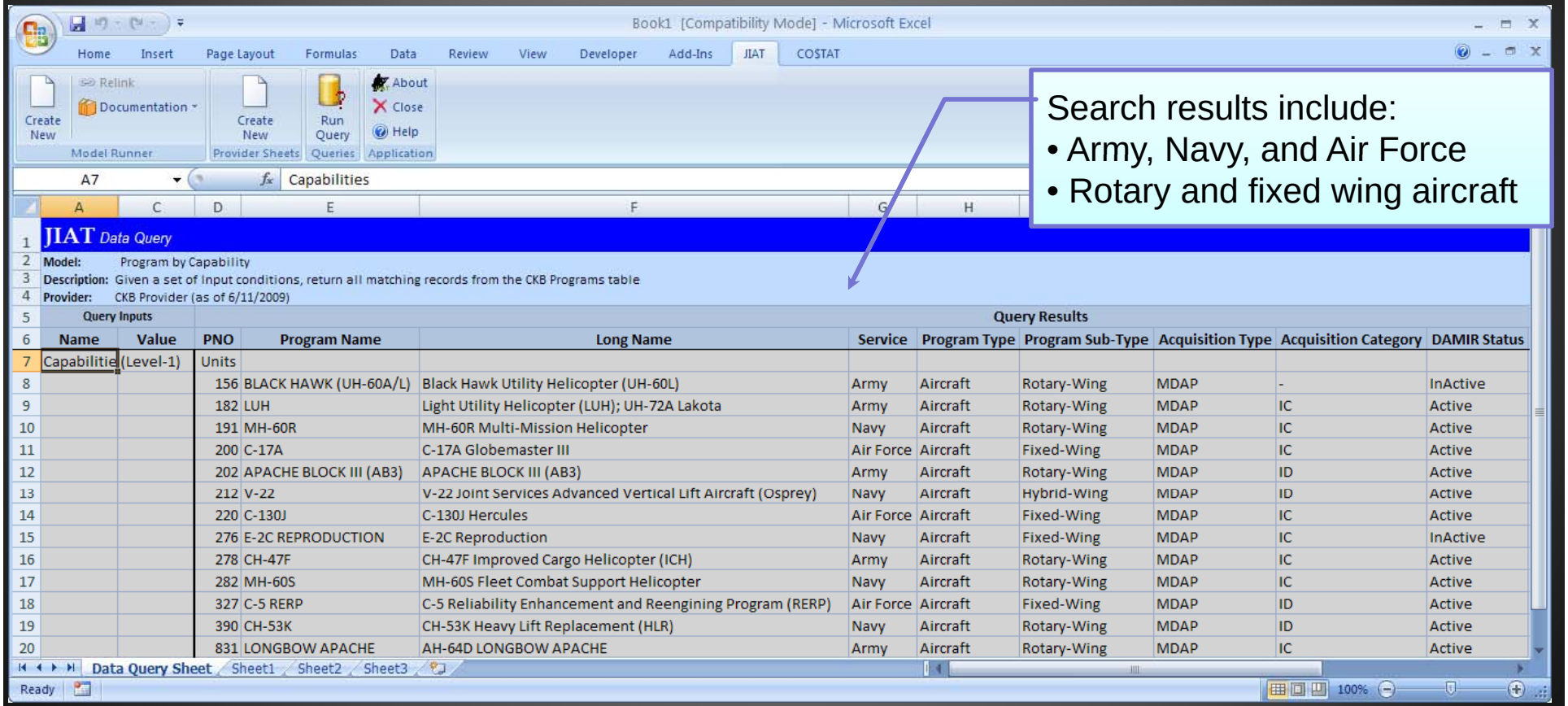
Quickly find Analogous Systems Using JIAT

- Use the CKB Provider to search for analogies by capabilities



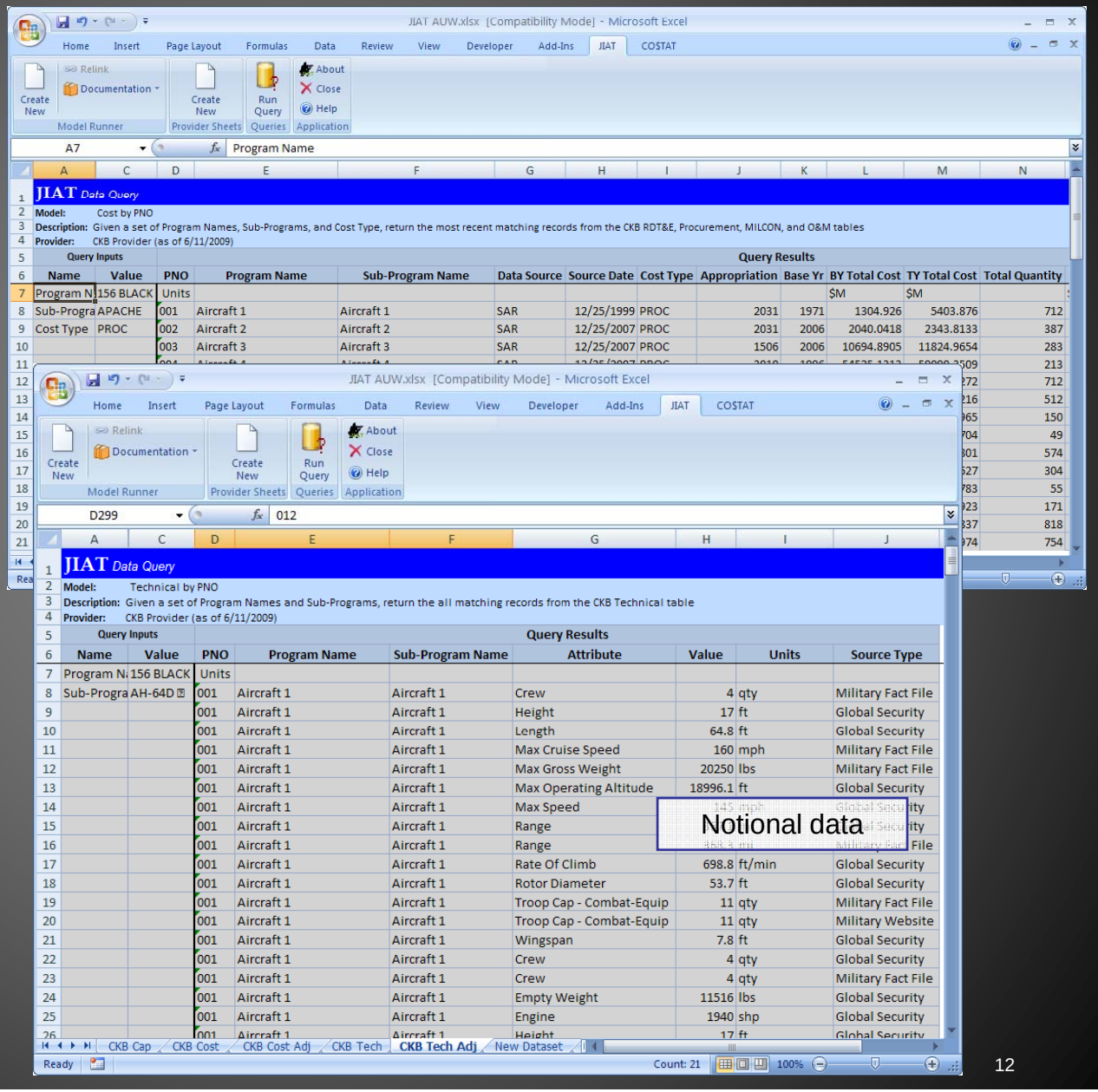
Quickly find Analogous Systems Using JIAT

- Results from the CKB Provider – "Program by Capability" search



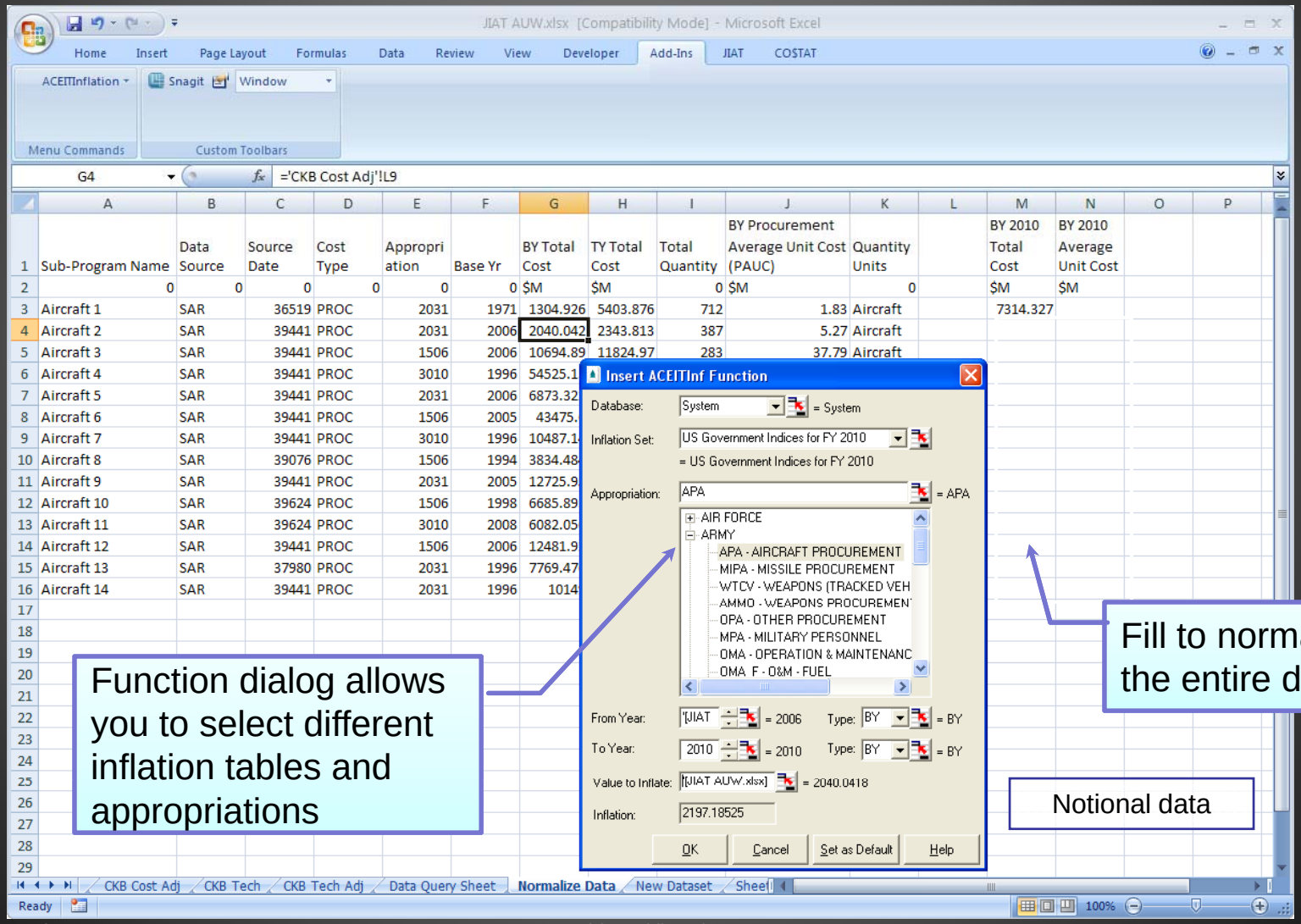
Use JIAT to Retrieve Program Data

- The CKB Provider allows you to retrieve cost, schedule, and technical data for systems by PNO
- Cost data is available for RDT&E, PROC, MILCON and O&M
- Technical data is available from sources like Military Fact files, and Global Security
- Schedule data shows Milestone dates and durations (not pictured)



Use ACEIT Inflation Utility to Normalize JIAT- Provided Data Sets

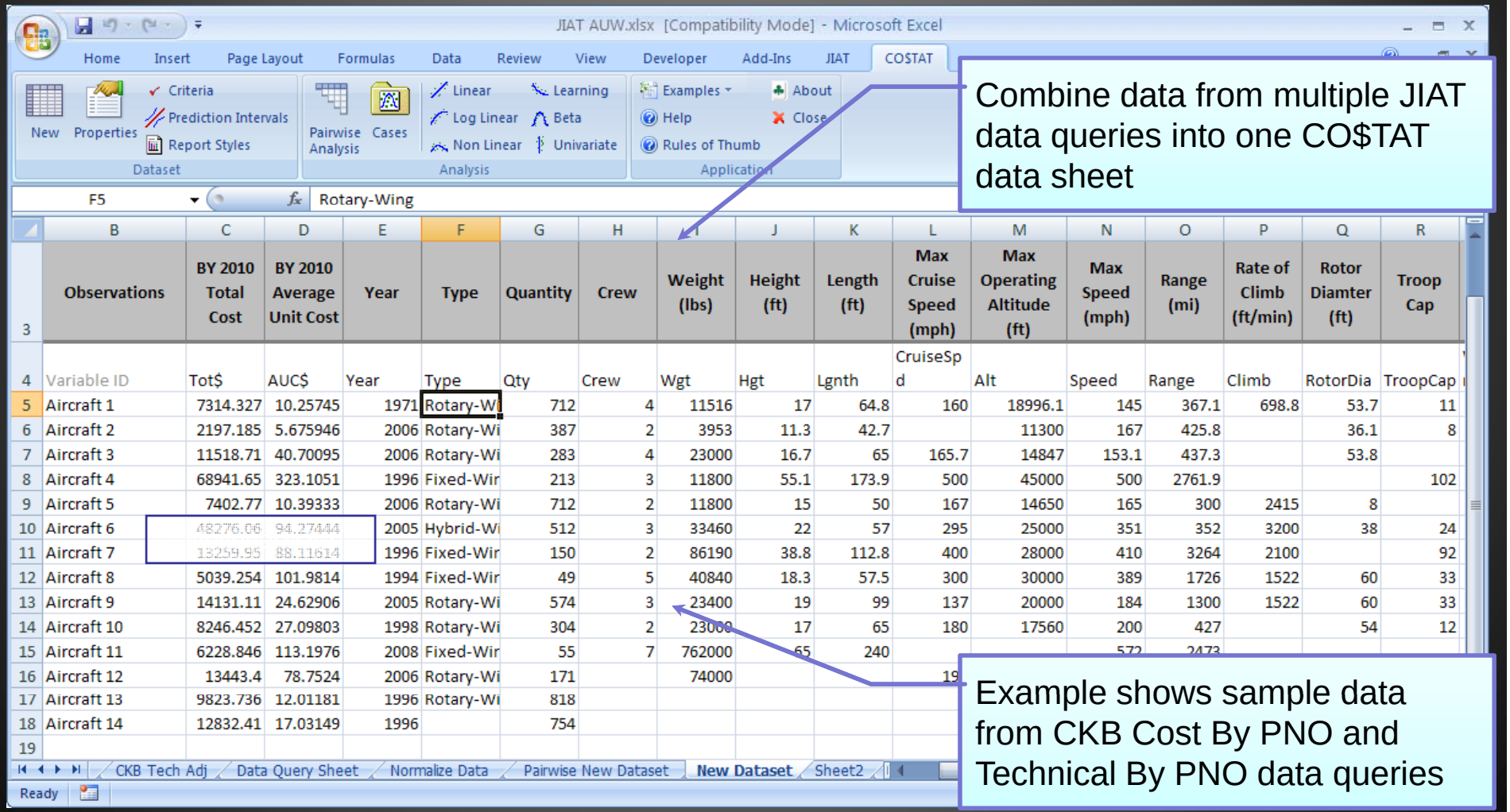
- Cost data often requires normalization before it can be analyzed
- ACEIT Inflation Utility allows you to use the ACE inflation tables in Excel worksheets



	Sub-Program Name	Data Source	Source Date	Cost Type	Appropriation	Base Yr	BY Total Cost	TY Total Cost	Total Quantity	BY Procurement Average Unit Cost (PAUC)	Quantity Units	BY 2010 Total Cost	BY 2010 Average Unit Cost
2	0	0	0	0	0	0	$M	$M	0	$M	0	$M	$M
3	Aircraft 1	SAR	36519	PROC	2031	1971	1304.926	5403.876	712	1.83	Aircraft	7314.327	
4	Aircraft 2	SAR	39441	PROC	2031	2006	2040.042	2343.813	387	5.27	Aircraft		
5	Aircraft 3	SAR	39441	PROC	1506	2006	10694.89	11824.97	283	37.79	Aircraft		
6	Aircraft 4	SAR	39441	PROC	3010	1996	54525.1						
7	Aircraft 5	SAR	39441	PROC	2031	2006	6873.32						
8	Aircraft 6	SAR	39441	PROC	1506	2005	43475.						
9	Aircraft 7	SAR	39441	PROC	3010	1996	10487.1						
10	Aircraft 8	SAR	39076	PROC	1506	1994	3834.48						
11	Aircraft 9	SAR	39441	PROC	2031	2005	12725.9						
12	Aircraft 10	SAR	39624	PROC	1506	1998	6685.89						
13	Aircraft 11	SAR	39624	PROC	3010	2008	6082.05						
14	Aircraft 12	SAR	39441	PROC	1506	2006	12481.9						
15	Aircraft 13	SAR	37980	PROC	2031	1996	7769.47						
16	Aircraft 14	SAR	39441	PROC	2031	1996	1014						

Move the Normalized JIAT Data to a CO$TAT Data Sheet

- CKB Provider's normalized data is passed into a CO$TAT data sheet where it is analyzed and CERs and factors are developed



3	Observations	BY 2010 Total Cost	BY 2010 Average Unit Cost	Year	Type	Quantity	Crew	Weight (lbs)	Height (ft)	Length (ft)	Max Cruise Speed (mph)	Max Operating Altitude (ft)	Max Speed (mph)	Range (mi)	Rate of Climb (ft/min)	Rotor Diamter (ft)	Troop Cap
4	Variable ID	Tot$	AUC$	Year	Type	Qty	Crew	Wgt	Hgt	Lgnth	CruiseSpd	Alt	Speed	Range	Climb	RotorDia	TroopCap
5	Aircraft 1	7314.327	10.25745	1971	Rotary-Wi	712	4	11516	17	64.8	160	18996.1	145	367.1	698.8	53.7	11
6	Aircraft 2	2197.185	5.675946	2006	Rotary-Wi	387	2	3953	11.3	42.7		11300	167	425.8		36.1	8
7	Aircraft 3	11518.71	40.70095	2006	Rotary-Wi	283	4	23000	16.7	65	165.7	14847	153.1	437.3		53.8	
8	Aircraft 4	68941.65	323.1051	1996	Fixed-Wir	213	3	11800	55.1	173.9	500	45000	500	2761.9			102
9	Aircraft 5	7402.77	10.39333	2006	Rotary-Wi	712	2	11800	15	50	167	14650	165	300	2415	8	
10	Aircraft 6	48276.06	94.27444	2005	Hybrid-Wi	512	3	33460	22	57	295	25000	351	352	3200	38	24
11	Aircraft 7	13259.95	88.11614	1996	Fixed-Wir	150	2	86190	38.8	112.8	400	28000	410	3264	2100		92
12	Aircraft 8	5039.254	101.9814	1994	Fixed-Wir	49	5	40840	18.3	57.5	300	30000	389	1726	1522	60	33
13	Aircraft 9	14131.11	24.62906	2005	Rotary-Wi	574	3	23400	19	99	137	20000	184	1300	1522	60	33
14	Aircraft 10	8246.452	27.09803	1998	Rotary-Wi	304	2	23000	17	65	180	17560	200	427		54	12
15	Aircraft 11	6228.846	113.1976	2008	Fixed-Wir	55	7	762000	65	240							
16	Aircraft 12	13443.4	78.7524	2006	Rotary-Wi	171		74000			19						
17	Aircraft 13	9823.736	12.01181	1996	Rotary-Wi	818											
18	Aircraft 14	12832.41	17.03149	1996		754											
19																	

Regress the JIAT Provided Data to Create a CER

Run a pair-wise analysis to see which variables have strong relationships and are potential cost drivers

Perform Linear, Log-Linear or Non-Linear regression to develop CERs or factors

View regression results and decide if the CER or factor is suitable for use within estimates

Pairwise Variable Analysis For Dataset New Dataset
Sunday, 28 November 2010, 2:00 pm

I. Correlation Matrix

	Tot$	AUC$	Year	Type	Qty	Crew	Wgt	Hgt	Lgnth	CruiseSpd	Al
Tot$	1.0000	0.6732	0.2004		-0.1758	0.4715	0.6803	0.9002	0.8822	-0.1144	
AUC$	0.6732	1.0000	0.3382		-0.7302	0.4200	0.9678	0.5844	0.4808	0.6435	
Year	0.2004	0.3382	1.0000		-0.4611	-0.5021	0.2564	-0.2515	-0.0391	0.1406	
Type				1.0000							
Qty	-0.1758	-0.7302	-0.4611		1.0000	0.0897	-0.6278	0.1559	0.0936	-0.6539	0.5891
Crew	0.4715	0.4200	-0.5021		0.0897	1.0000	0.2949	0.4950	0.3835	-0.3382	0.4123
Wgt	0.6803	**0.9678**	0.2564		-0.6278	0.2949	1.0000	0.8396	0.7367	0.6520	-0.4659
Hgt	**0.9002**	0.5844	-0.2515		0.1559						
Lgnth	**0.8822**	0.4808	-0.0391		0.0936						
CruiseSpd	-0.1144	0.6435	0.1406		-0.6539						
Alt	0.1812	-0.4750	-0.5060		0.5891						
Speed	0.1800	0.1939	0.4118		-0.3640						
Range	0.5955	0.0991	0.2321		0.0711						
Climb	-0.0122	-0.0152	**0.8668**		0.0235						
RotorDia	0.4898	0.5468	-0.3122		-0.3952						
TroopCap	**0.9102**	0.5890	0.2272		0.3975						
Wings											
Engin											

Linear Analysis for Dataset New Dataset, Case 6
Wednesday, 01 December 2010, 8:47 am

I. Model Form and Equation Table

Model Form:	Unweighted Linear model
Number of Observations Used:	7
Equation in Unit Space:	AUC$ = (-5.26) + 0.002491 * Wgt + (-0.005473) * Engine

II. Fit Measures (in Fit Space)

Coefficient Statistics Summary

Variable	Coefficient	Std Dev of Coef	Beta Value	T-Statistic (Coef/SD)	P-Value	Prob Not Zero
Intercept	-5.2604	5.1321		-1.0250	0.3633	0.6367
Wgt	0.0025	0.0008	2.2669	3.2878	0.0303	0.9697
Engine	-0.0055	0.0029	-1.3105	-1.9007	0.1300	0.8700

Goodness-of-Fit Statistics

Std Error (SE)	R-Squared	R-Squared (Adj)	Pearson's Corr Coef
5.6727	96.68%	95.01%	0.9832

JIAT AUW.xlsx - Microsoft Excel

Home | Insert | Page Layout | Formulas | Data | Review | View | Developer | Add-Ins | COSTAT

New | Properties | Criteria | Prediction Intervals | Report Styles | Dataset | Pairwise Analysis | Cases | Linear | Learning | Examples | About

Linear Model

Specifications | Results

Case Name: Case 6

Dependent Variable — Name: AUC$ — Transform:

Weighting Variable

Options — Ridge Parameter: — Maximum Iterations: — Method: — MUPE — Intercept (Non Origin)

Report Precision — Precision: — Digits

Variables

Name	Not Used	Independ	Dum
Tot$			
Year			
Type			
Qty			
Crew			
Wgt		●	
Hgt			
Lgnth			
CruiseSpd			
Alt			
Speed			
Range			
Climb			
RotorDia			
TroopCap			
Wingspan			
Engine		●	

Cancel | Help

E3 | Year

	B	C	D	E
	Observations	BY 2010 Total Cost	BY 2010 Average Unit Cost	Year
3				

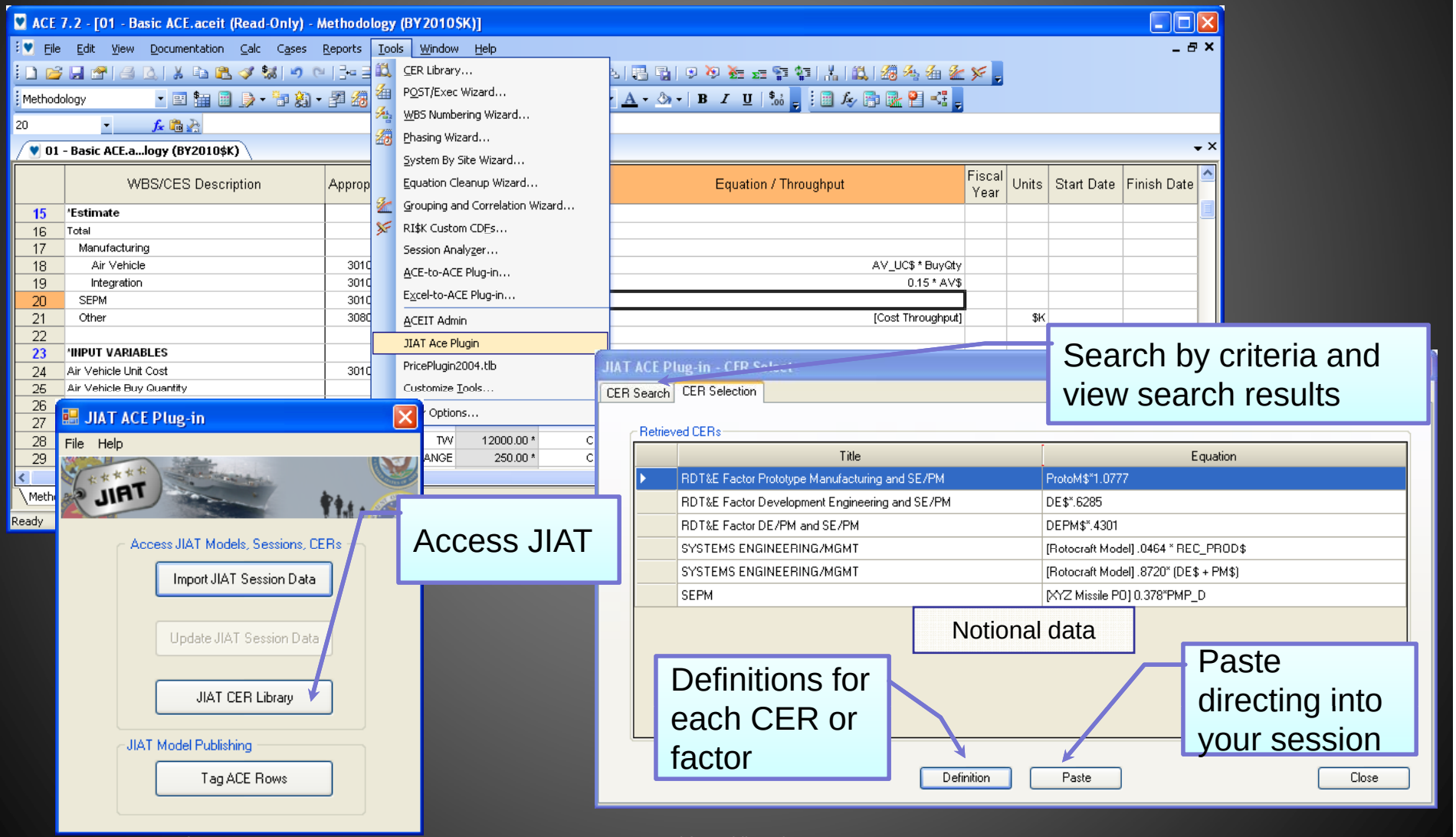
	Year	Type
5745	1971	Rotar
5946	2006	Rotar
0095	2006	Rotar
.1051	1996	Fixed
9333	2006	Rotar
7444	2005	Hybri
.1614	1996	Fixed
.9814	1994	Fixed
2906	2005	Rotar
9803	1998	Rotar
.1976	2008	Fixed

Using JIAT's CER Library in ACE

- JIAT currently hosts over 150 documented CERs and factors available for Army users
- CER and factor sources
  - ✓ Missile Blue Book
  - ✓ Ground Vehicles Blue Book
  - ✓ Manned and Unmanned Aircraft (library created by ODASA-CE analyst from several documented studies)
- Permissions are set by user group and individual user to allow access to various libraries
- Private libraries can be created for other organizations or groups
  - ✓ Example: CECOM has its own factors library available only to CECOM analysts
- Search across all libraries by phase, keyword, and text from a single login and simple-to-navigate user interface

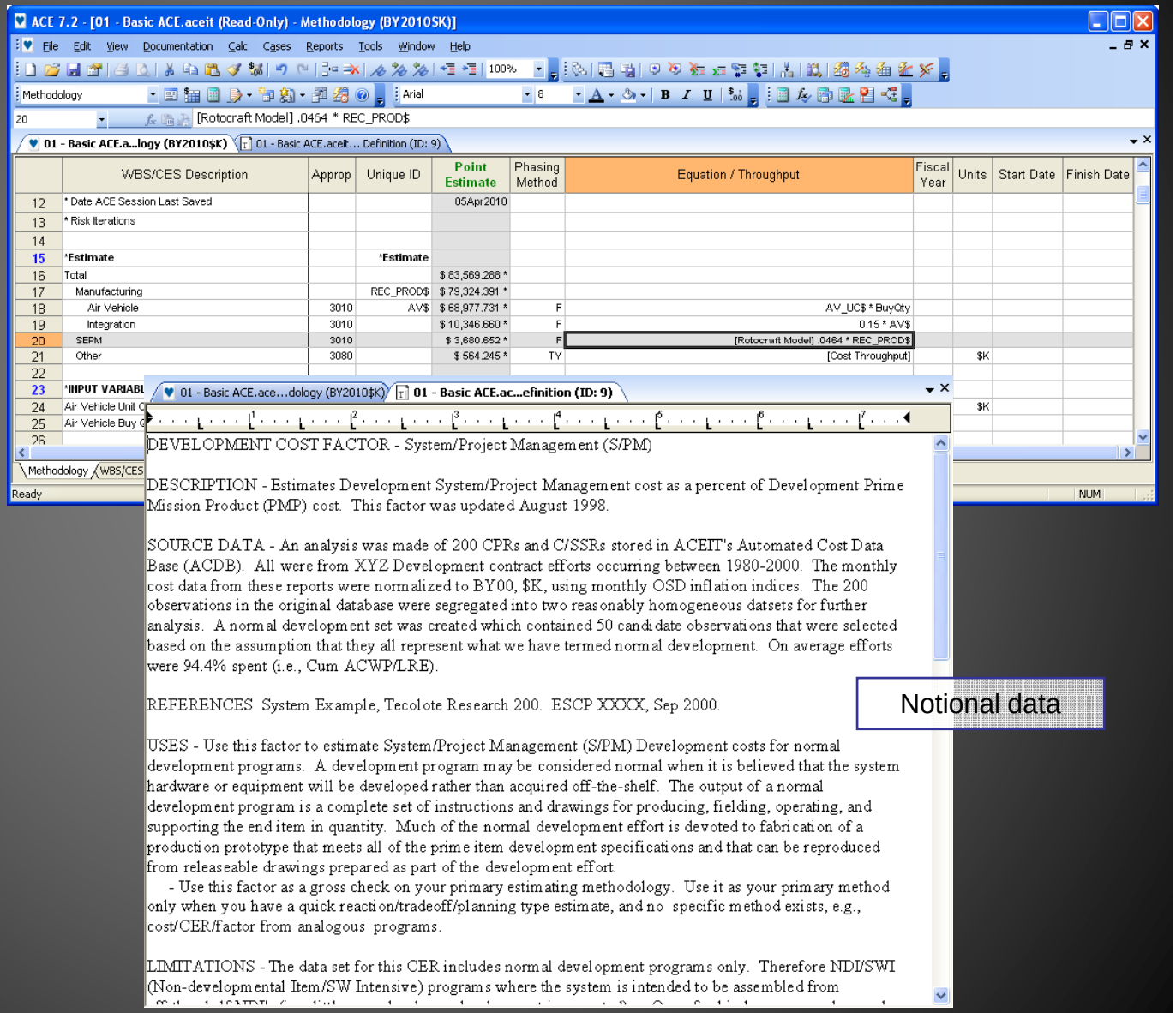
Search JIAT Libraries from ACE

- JIAT expands your CER Library!
- Search through JIAT hosted libraries and pull CERs and factors directly into ACE



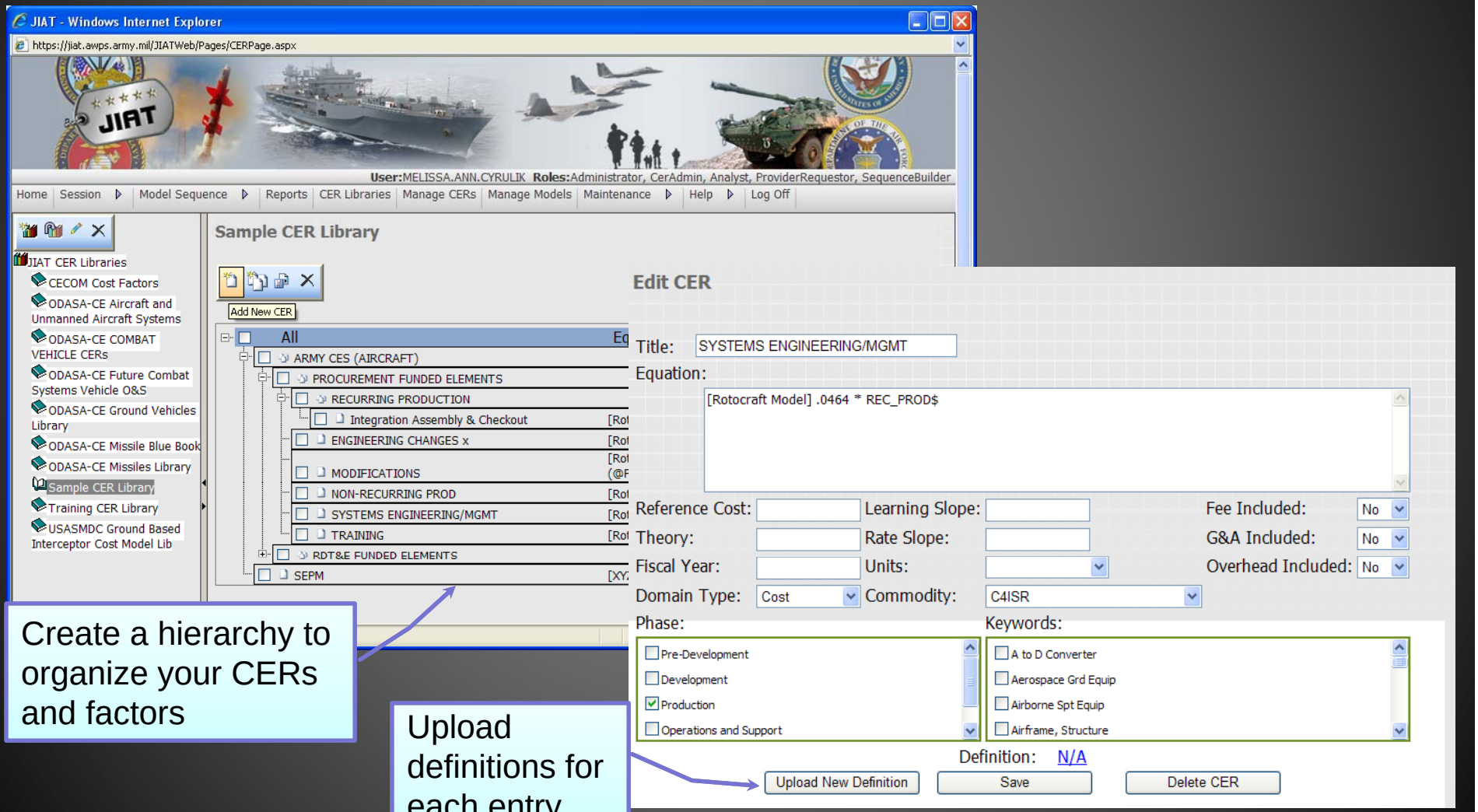
Import JIAT CERs into ACE

- Examine CERs that meet the search criteria and review their parameters and documentation
- Paste selected CER or factor into the session (see previous slide)
- Link imported equation IDs into the structure of the session
- Documentation is automatically imported into the session and stored on the estimate row



Create your Own JIAT CER Libraries

- Use the JIAT website to post CERs and create libraries

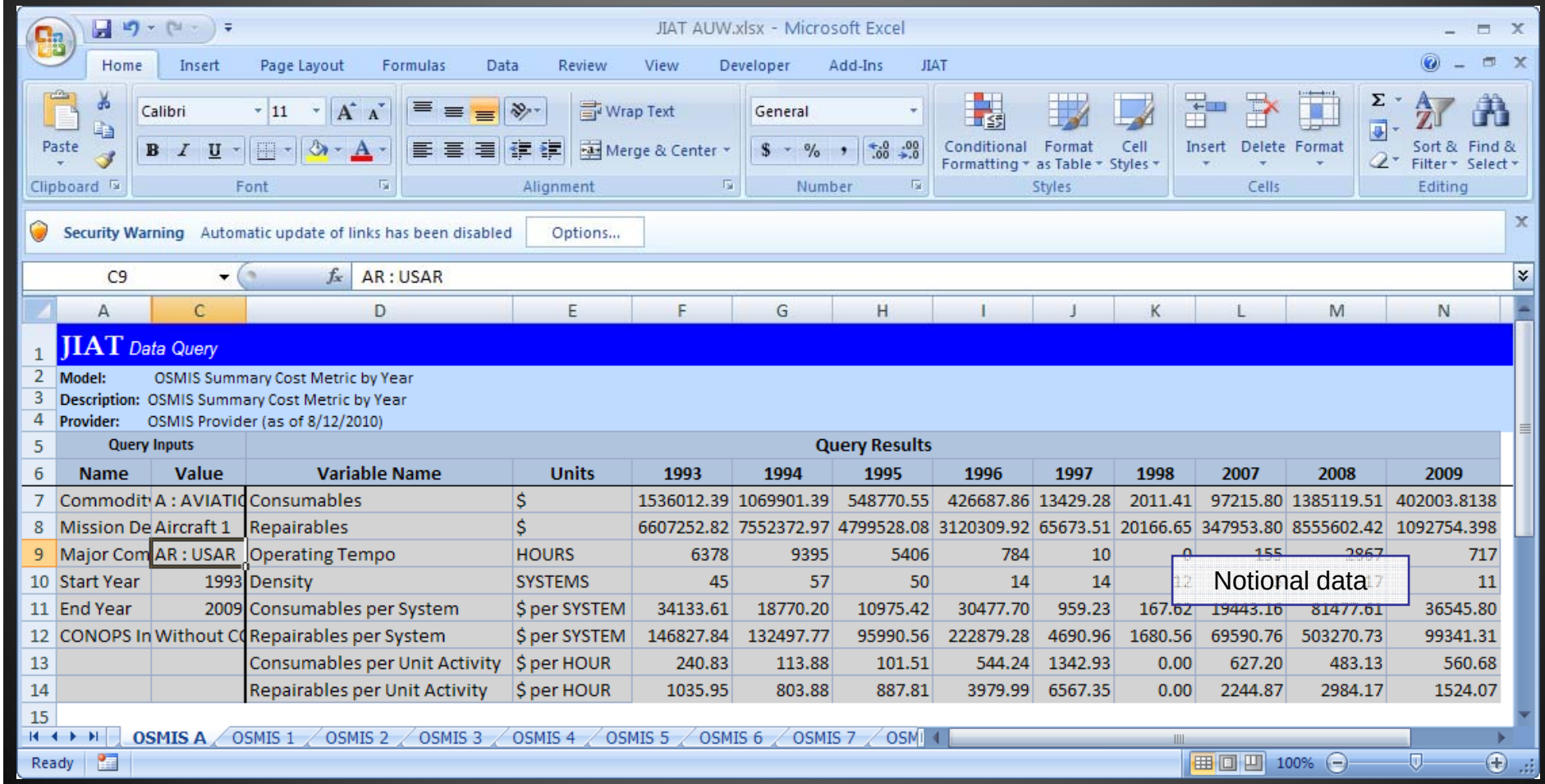


Study Datasets for Uncertainty Specifications

- Study dataset to understand its range and distribution shape
- Range and shape information can be used to define uncertainty distributions for ACE RI$K calculations
- Use CO$TAT Univariate Analysis
- Use data from any JIAT database Provider
  - ✓ The following example uses OSMIS data

Study JIAT Datasets with CO$TAT

- Use OSMIS Provider to get “Consumables per System” cost for last ten years of operation of Aircraft 1 across its 10 major operating command areas
  - ✓ 77 data points extracted (sample data below depicts data for aircraft in one command)



JIAT AUW.xlsx - Microsoft Excel

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C9 AR : USAR

JIAT *Data Query*

Model: OSMIS Summary Cost Metric by Year
Description: OSMIS Summary Cost Metric by Year
Provider: OSMIS Provider (as of 8/12/2010)

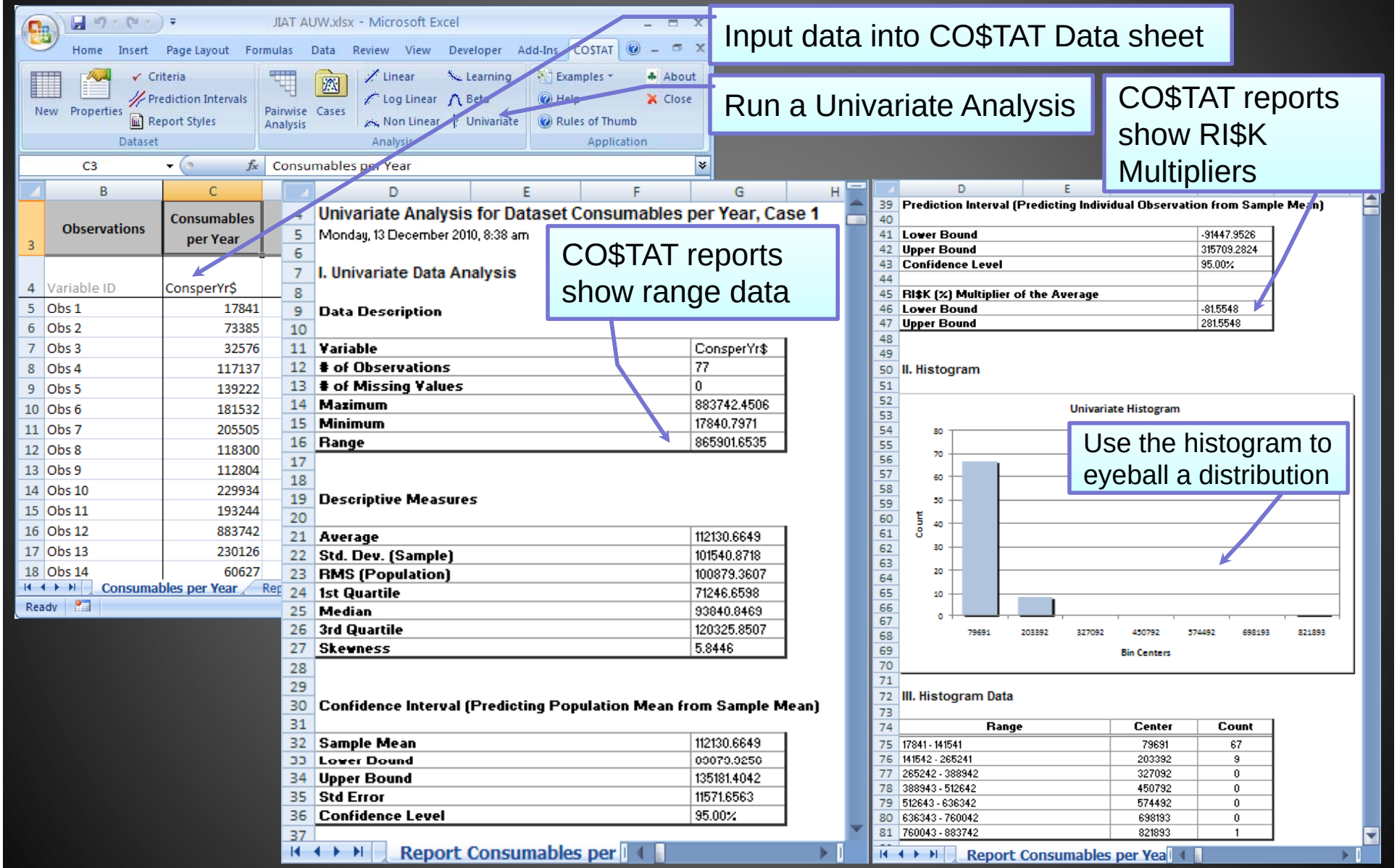
Query Inputs		Query Results										
Name	Value	Variable Name	Units	1993	1994	1995	1996	1997	1998	2007	2008	2009
Commodit	A : AVIATI	Consumables	$	1536012.39	1069901.39	548770.55	426687.86	13429.28	2011.41	97215.80	1385119.51	402003.8138
Mission De	Aircraft 1	Repairables	$	6607252.82	7552372.97	4799528.08	3120309.92	65673.51	20166.65	347953.80	8555602.42	1092754.398
Major Com	AR : USAR	Operating Tempo	HOURS	6378	9395	5406	784	10	0	155	2867	717
Start Year	1993	Density	SYSTEMS	45	57	50	14	14	12	12	12	11
End Year	2009	Consumables per System	$ per SYSTEM	34133.61	18770.20	10975.42	30477.70	959.23	167.62	19443.16	81477.61	36545.80
CONOPS In	Without C	Repairables per System	$ per SYSTEM	146827.84	132497.77	95990.56	222879.28	4690.96	1680.56	69590.76	503270.73	99341.31
		Consumables per Unit Activity	$ per HOUR	240.83	113.88	101.51	544.24	1342.93	0.00	627.20	483.13	560.68
		Repairables per Unit Activity	$ per HOUR	1035.95	803.88	887.81	3979.99	6567.35	0.00	2244.87	2984.17	1524.07

Notional data

OSMIS A | OSMIS 1 | OSMIS 2 | OSMIS 3 | OSMIS 4 | OSMIS 5 | OSMIS 6 | OSMIS 7 | OSM

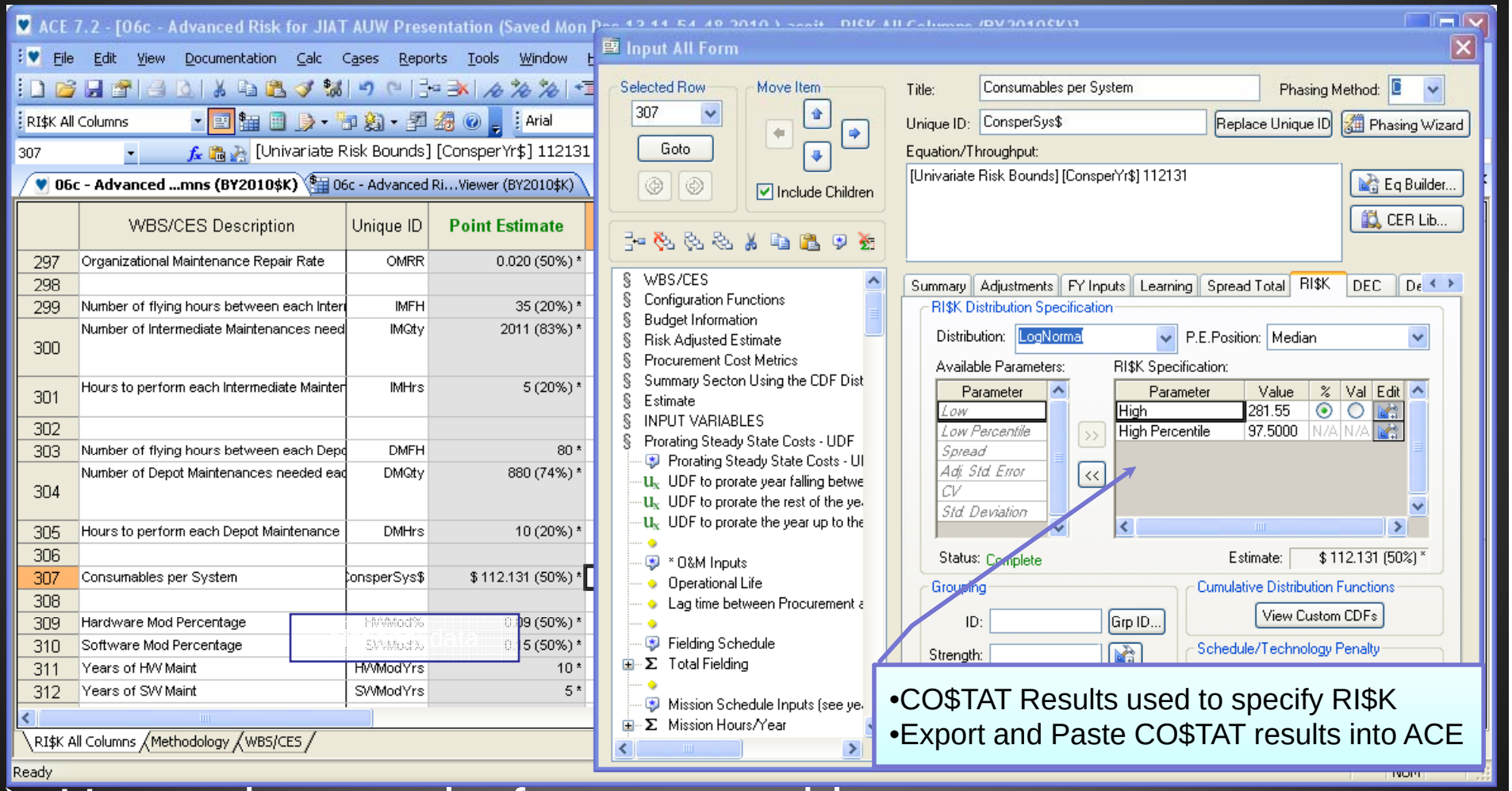
Ready 100%

CO$TAT Univariate Analysis



Incorporate Distribution Information into your Uncertainty Analysis

➢ Enter estimate and RI$K distribution



➢ Uncertainty results for consumable row

	WBS/CES Description	Point Estimate	Mean	Std Dev	CV	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%
307	Consumables per System	112.131 (50%)	128.939	$ 73.274	0.5683	$ 47.058	$ 56.991	$ 64.867	$ 71.892	$ 78.529	$ 84.995	$ 91.467	$ 98.077	$ 104.923	$ 112.121	$ 119.827	$ 128.206	$ 137.413	$ 147.904	$ 160.133

Taking it one step further with ACEIT Distribution Finder (DF)

- Where the Univariate analysis provides data range analysis it only helps you develop an approximation on which uncertainty distribution to utilize
- Tools like ACEIT Distribution Finder and CO$TAT 7.3 provide features that make recommendations on distribution shapes
- ACEIT Distribution Finder Utility Prototype developed in July 2010
  - ✓ Prototype explored methods to fit distributions to data and how to report results
- CO$TAT 7.3 will include Distribution Finder
  - ✓ Simplified user interface and generic, CO$TAT-type report
- This brief shows a version of the Distribution Finder Utility Prototype
  - ✓ The prototype is not a supported application
- JIAT users can use any commercial tool that can draw data from Excel or ACEIT to perform this function

Distribution Utility Recommends an Uncertainty Distribution

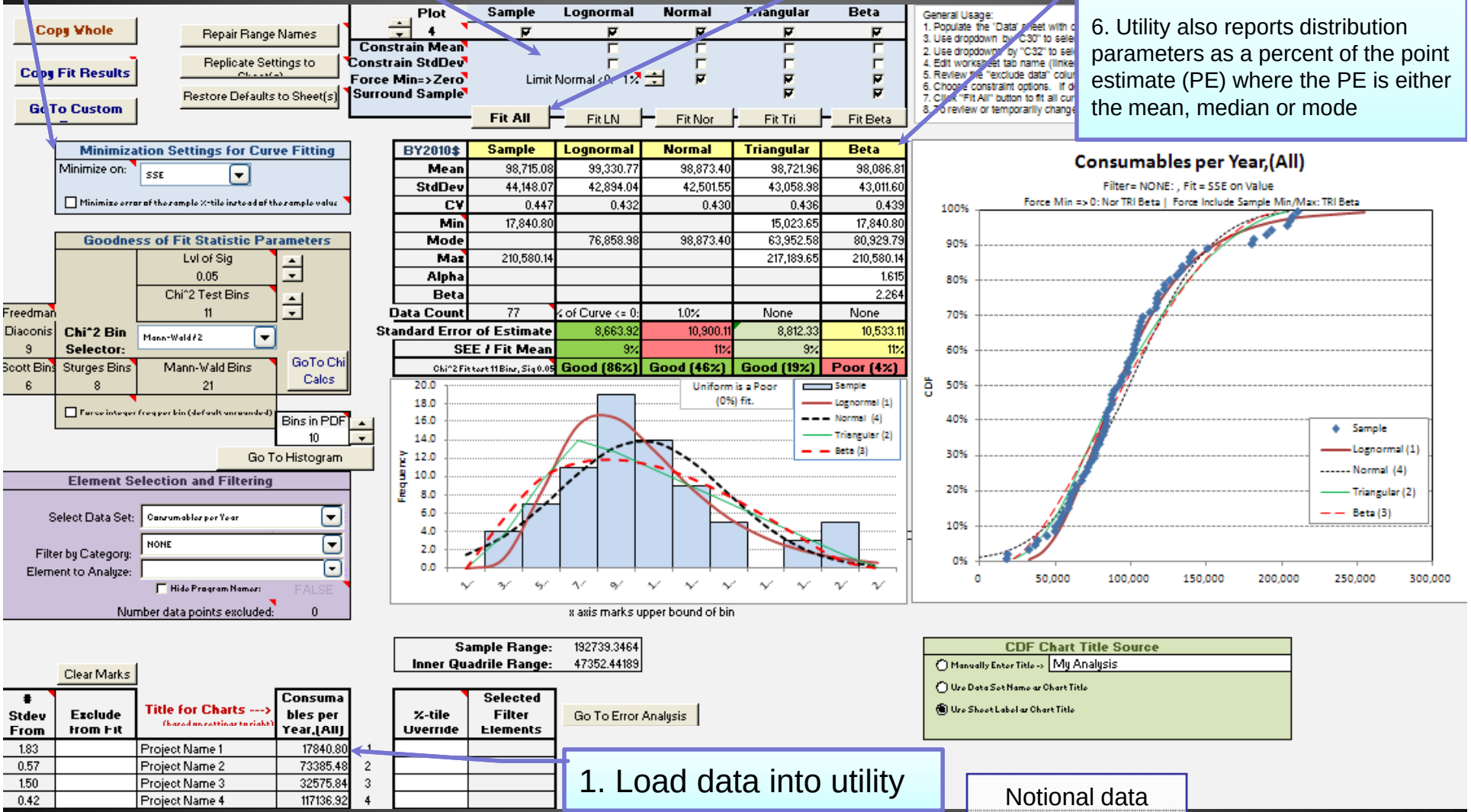
2. Set fit parameters

3. Set Fit Constraints

4. Run "Fit All"

5. Study results of "Fit"

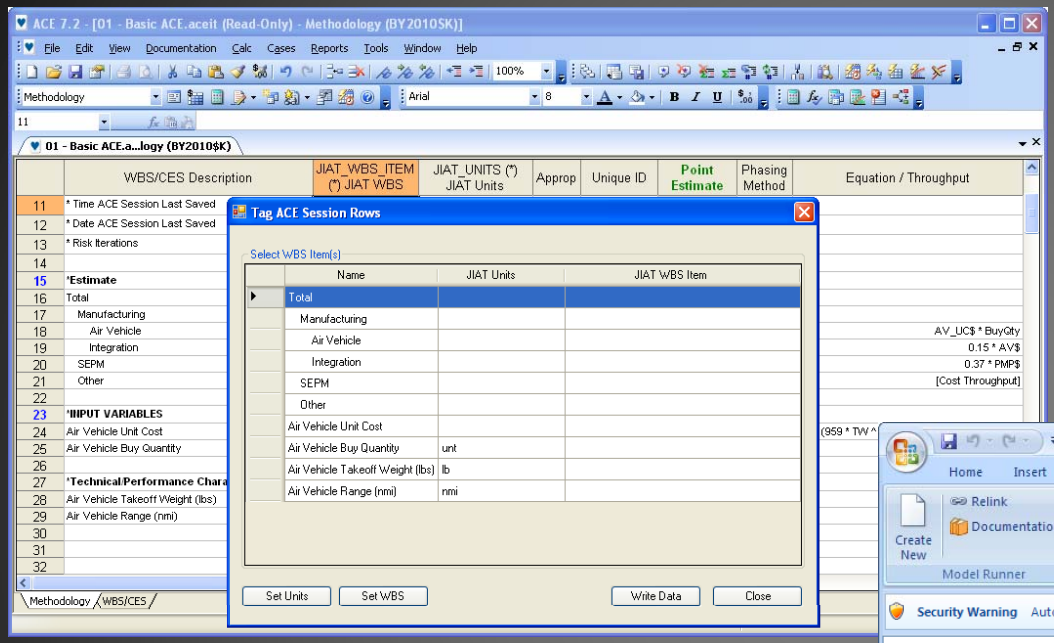
6. Utility also reports distribution parameters as a percent of the point estimate (PE) where the PE is either the mean, median or mode



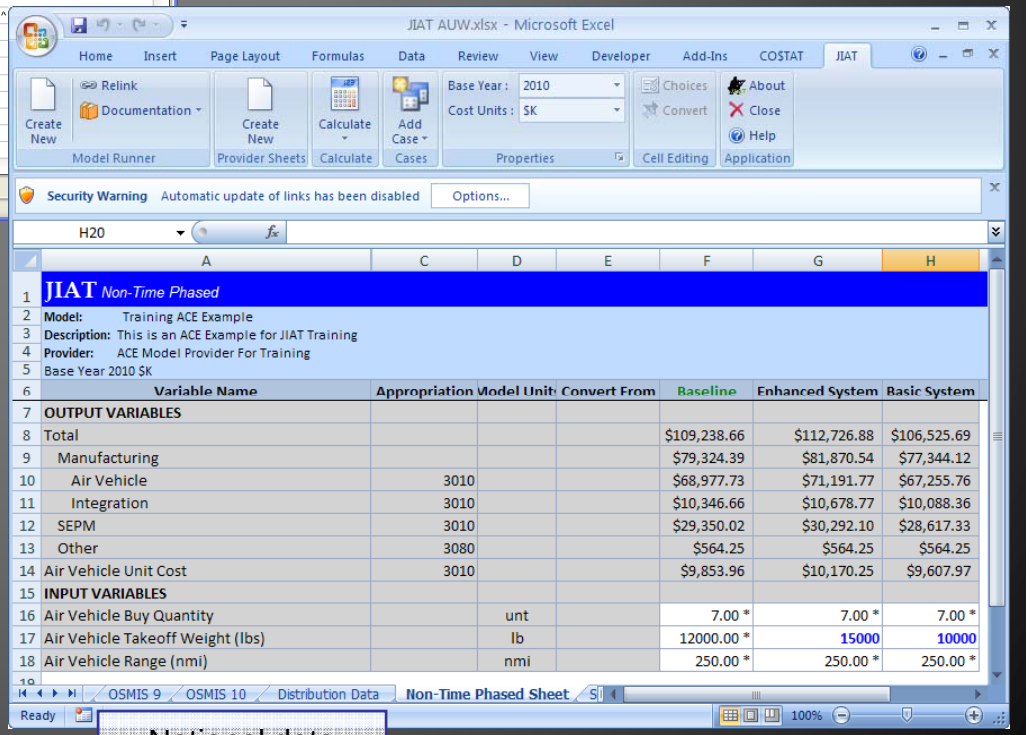
1. Load data into utility

Notional data

Additional Areas where JIAT and ACEIT Come Together



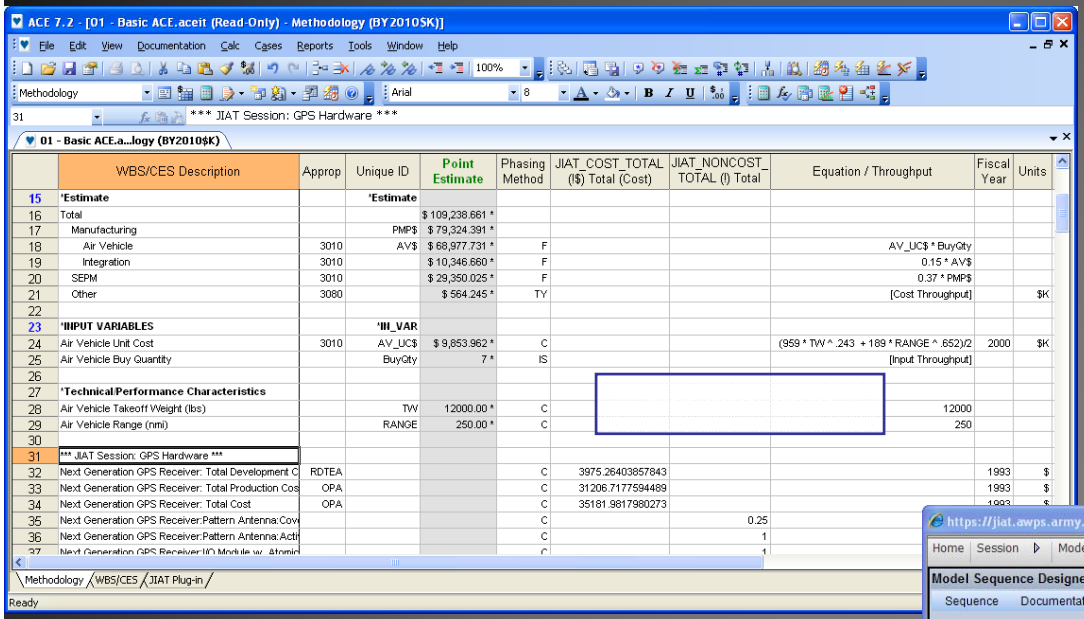
- Set up ACE sessions to load and run in JIAT
  - ✓ Tag session units
  - ✓ Identify ACE rows to show in JIAT



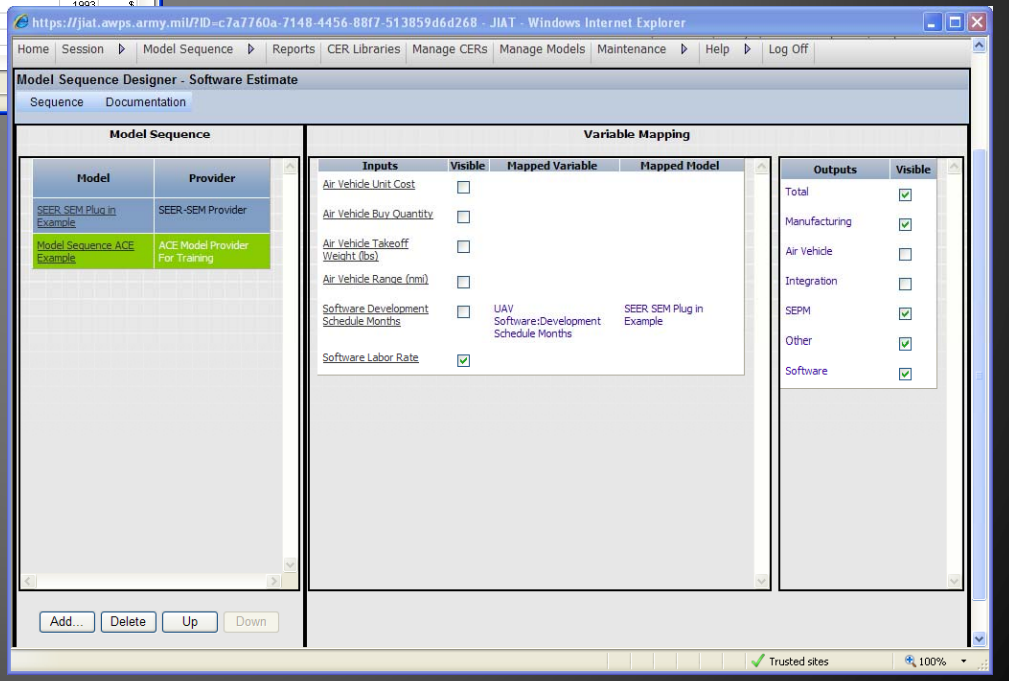
- Run ACE Models in JIAT Excel Client
  - ✓ Access ACE models stored on server
  - ✓ Run what-if cases
  - ✓ Run total and time-phased
  - ✓ Also runs in web browser

Notional data

Additional Areas where JIAT and ACEIT Come Together



- Import model results from JIAT-hosted models into your ACE session
  - ✓ Run a model in the JIAT web browser and save it to your account
  - ✓ Models include Excel, PRICE-H, SEER SEM and ACE
  - ✓ From within ACE access your JIAT models and import them into your ACE session



- Create model sequences with ACE sessions in the series
  - ✓ Model sequences chain models together to pass inputs/results across multiple models
  - ✓ Example shows a SEEM SEM model passing software effort months to an ACE cost estimate
  - ✓ Resulting sequence is run like one model

Coming in JIAT 2.2

- Enhancements and studies for the next version of JIAT (due September 2011)
  - ✓ACDB model providers for all the ACDB Army databases
  - ✓AIM Provider to provide Army DAMIR and AV/SOA data
  - ✓DCARC CSDR-SR Provider
  - ✓Web Link libraries
  - ✓Military Composite Rates Provider
  - ✓Data query export to CO$TAT
  - ✓Study FEDLOG to gather requirements for a potential FEDLOG Provider

Overview of JIAT Benefits

- Web services technology provides a platform to bring multiple tools together in one workplace
- Established a Service-Oriented Architecture (SOA) framework to encourage the integration of other Services' cost estimating tools and databases
- JIAT can easily segment user groups by Service and command
- Analyses for all phases of the program – including pre-Milestone A
- Comprehensive analysis can reduce program risk by addressing hardware, software, and programmatic requirements early in the program's life cycle

Conclusion

- **JIAT allows you to obtain controlled access to a wide variety of data from a single interface and login**
- **Access to data is controlled by user group and individual permission levels**
- **You can use JIAT data**
  - ✓ To support building your ACE models
  - ✓ In your CO$TAT analysis to build CERs and factors
  - ✓ To identify uncertainty distributions to enter into ACE RI$K
- **You can use JIAT CER Libraries**
  - ✓ To expand your available CERs and factors
  - ✓ To organize your CERs and factors so they can be used across your organization and easily inserted into your ACE sessions
- **Additionally, JIAT provides access to other model sources that can be imported into your estimates**

JIAT provides the data to drive your ACE models

Back Up

Identifying DF Results to Enter into ACE

- DF recommends distributions and provides relevant statistics

Example
- DF recommends Log Normal distribution
- Normal and Triangular also good
- All three distributions are statistically significant

BY2010$	Sample	Lognormal	Normal	Triangular	Beta
Mean	98,715.08	99,330.77	98,873.40	98,721.96	98,086.81
StdDev	44,148.07	42,894.04	42,501.55	43,058.98	43,011.60
CV	0.447	0.432	0.430	0.436	0.439
Min	17,840.80			15,023.65	17,840.80
Mode		76,858.98	98,873.40	63,952.58	80,929.79
Max	210,580.14			217,189.65	210,580.14
Alpha					1.615
Beta					2.264
Data Count	77	% of Curve <= 0:	1.0%	None	None
Standard Error of Estimate		8,663.92	10,900.11	8,812.33	10,533.11
SEE / Fit Mean		9%	11%	9%	11%
Chi^2 Fit test 11 Bins, Sig 0.05		Good (86%)	Good (46%)	Good (19%)	Poor (4%)

These tables contain fit paramaters ans statistics that have been normalized by either the Mean, Median or Mode. Use these as percent multipiers of your point estimate.

Recommended Fit: Lognormal (Mean = 99330.77, Std Dev = 42894.04)

Condensed Recommendation: Lognormal (99330.77, 42894.04)

Consumables per Year,(All) Unitized by Mean

	Sample	LN	Normal	Tri	Beta
Mean	1.0000	1.0000	1.0000	1.0000	1.0000
Std Dev	0.4472	0.4318	0.4299	0.4362	0.4385
CV	0.4472	0.4318	0.4299	0.4362	0.4385
Min	0.1807			0.1522	0.1819
Mode		0.7738	1.0000	0.6478	0.8251
Max	2.1332			2.2000	2.1469
Sample Mean/ Dist Mean		0.9938	0.9984	0.9999	1.0064
Dist Median/Dist Mean	0.9321	0.9181	1.0000	0.9393	0.9692
SDev Log Space		0.4135			
SEE/Dist Mean		0.0872	0.1102	0.0893	0.1074

Consumables per Year,(All) Unitized by Median

	Sample	LN	Normal	Tri	Beta
Mean	1.0729	1.0893	1.0000	1.0646	1.0317
Std Dev	0.4798	0.4704	0.4299	0.4643	0.4524
CV	0.4472	0.4318	0.4299	0.4362	0.4385
Min	0.1939			0.1620	0.1877
Mode		0.8428	1.0000	0.6896	0.8513
Max	2.2887			2.3421	2.2150
Sample Median/Dist Median		1.0090	0.9306	0.9922	0.9678
Dist Median/Dist Median	1.0000	1.0000	1.0000	1.0000	1.0000
SDev Log Space		0.4135			
SEE/Dist Median		0.0950	0.1102	0.0950	0.1108
Actual Median	92008.15	911[illegible]			

Consumables per Year,(All) Unitized by Mode

	Sample	LN	Normal	Tri
Mean		1.2924	1.0000	1.5437
Std Dev		0.5581	0.4299	0.6733
CV		0.4318	0.4299	0.4362
Min				0.2349
Mode		1.0000	1.0000	1.0000
Max				3.3961
Sample Mode/Dist Mode				
Dist Median/Dist Mode		1.1865	1.0000	1.4500
SDev Log Space		0.4135		
SEE/Dist Mode		0.1127	0.1102	0.1378

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Recommended Fit

Long Form	Lognormal (Mean = 1.0000, Std Dev = 0.4318)
Short Form	Lognormal (1.0000, 0.4318)
Fitted Mean	1.0000
Fitted Std Dev	0.4318
Fitted CV	0.4318
Low	
Mode	0.7738
High	
Sample Mean/ Dist Mean	0.9938
Dist Median/Dist Mean	0.9181
SDev Log Space	0.4135
SEE/Dist Mean	0.0872

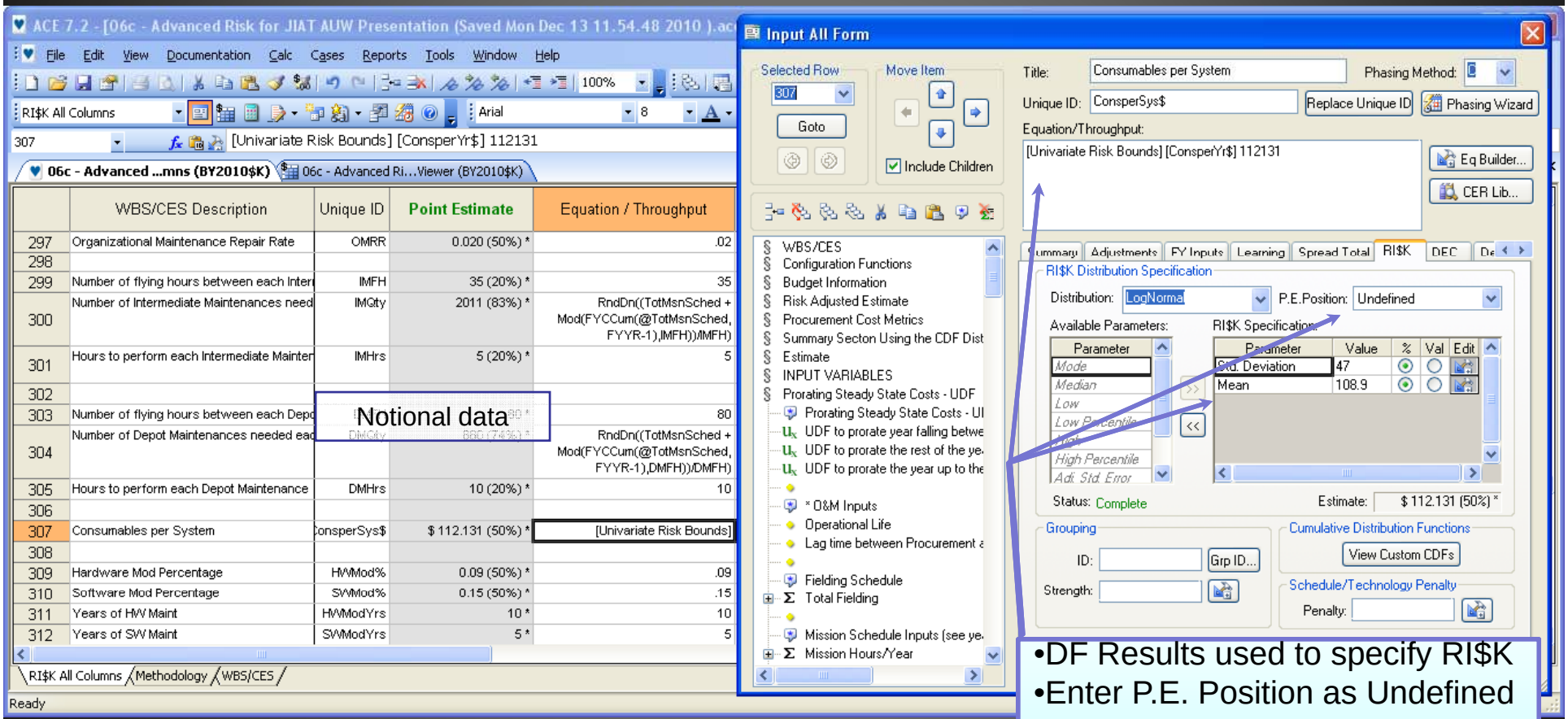
Recommen

	Lognormal (Mean =
	Lognormal (1.0893,
Fitted Mean	1.0893
Fitted Std Dev	0.4704
Fitted CV	0.4318
Low	
Mode	0.8428
High	
Sample Mean/ Dist Mean	1.0090
Dist Median/Dist Mean	1.0000
SDev Log Space	0.4135
SEE/Dist Mean	0.0950

- RI$K best practice is to define parameters as a percent of the PE
- DF provides unitized results based on PE interpretation
- For Log-Normal, generally select "Unitized by Median"
- DF always reports the mean and stdev for lognormal

Incorporate Distribution Information into your Uncertainty Analysis

- Enter estimate and RI$K distribution from DF results



- DF Results used to specify RI$K
- Enter P.E. Position as Undefined
- Enter Std Dev and Mean as % of PE

- Uncertainty results for consumable row

	WBS/CES Description	Point Estimate	Mean	Std Dev	CV	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%
307	Consumables per System	112.131 (50%)	122.124	$ 52.780	0.4322	$ 56.829	$ 66.017	$ 73.055	$ 79.177	$ 84.841	$ 90.261	$ 95.595	$ 100.960	$ 106.434	$ 112.107	$ 118.092	$ 124.507	$ 131.451	$ 139.240	$ 148.171