



Engineering, Operations & Technology
Information Technology

Boeing's Estimation Support System (ESS)

Estimating Support Group

Software Development Life Cycle

Engineering, Operations & Technology | Information Technology

Systems Quality and Compliance



Version
4.5

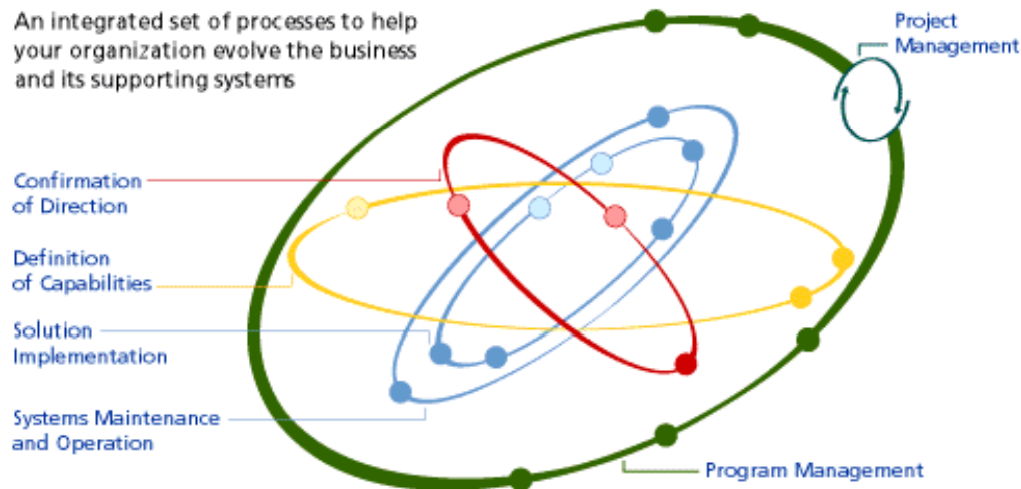
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An integrated set of processes to help your organization evolve the business and its supporting systems



StrategyForum ArchitectureLab ProductivityCentre ResultStation
ManagementSuite

- Boeing AD&S Process
- Boeing Estimation Support System (ESS)

Using MacroScope

- Getting Started
- Overview
- User Interface
- What's New?
- FAQs
- Performing a Search
- View Support Material
- MacroScope Supplemental Material
- Download Tool Setups
- How to Get Help



Boeing Standards Info

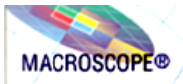
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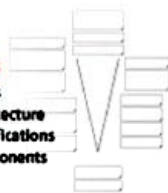
ProductivityCentre

[Deliverables](#) | [Processes](#) | [Techniques](#) | [Roles](#) | [Adaptations](#) | [Support](#)

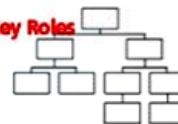
Designing, implementing and sustaining information solutions to achieve business goals

Deliverables

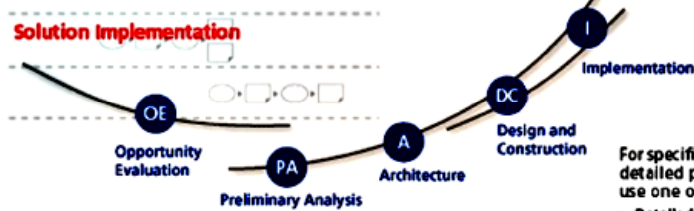
- Requirements
- System Architecture
- System Specifications
- System Components
- Quality
- Results



Key Roles



Solution Implementation



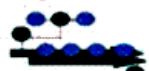
More ...

- Overview
- Fundamentals
- Key Concepts
- FAQs

For specific circumstances, or for more detailed processes and deliverables, use one of the following paths:

- Detailed Delivery Paths
- Systems Maintenance and Operation Paths

Boeing AD&S Process



Boeing IT Application Development and Sustaining Process

Boeing Standards Info

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Software Development Life Cycle



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Solution Development Deliverables
Phase Reports

Printable Version

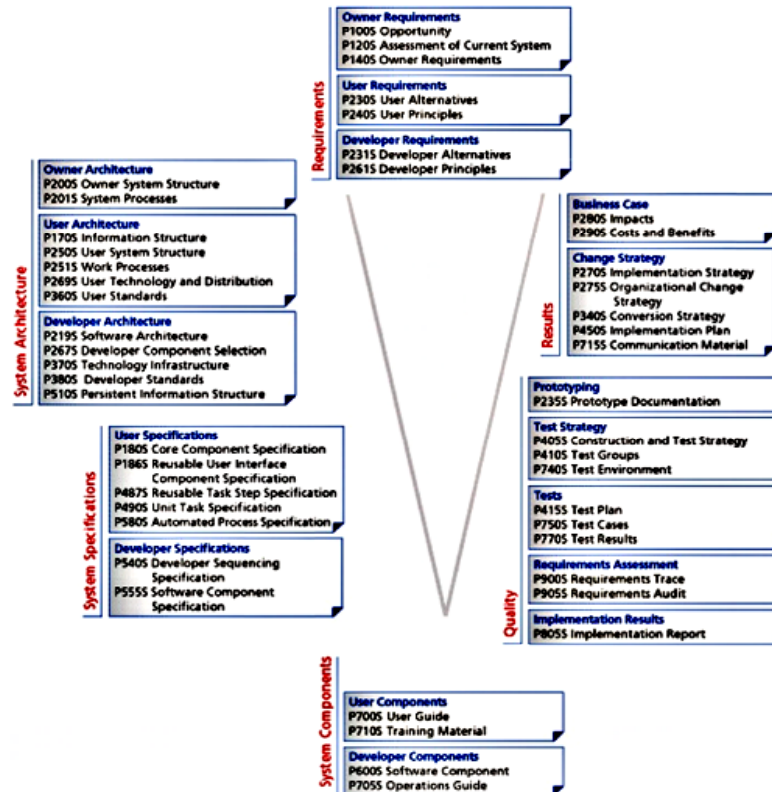


Solution Development Deliverables

Deliverables [Structure](#) | [Structured List](#) | [Streamlined Ordered List](#) | [Support Material](#)

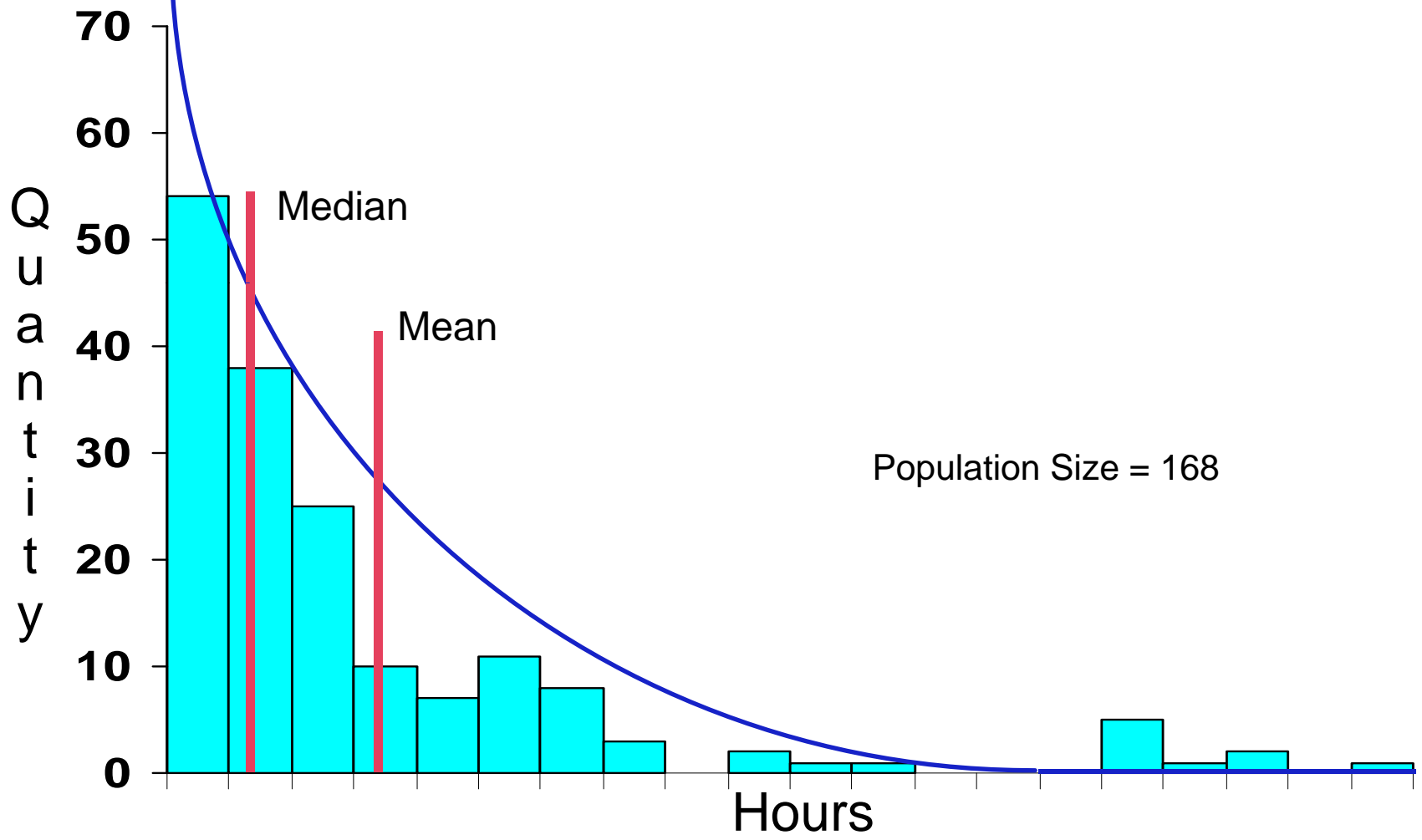
Deliverable Structure

A high-level understanding of the ProductivityCentre system delivery process can be obtained by viewing and navigating the deliverable structure presented below. Because the deliverables are aligned with system delivery roles (see descriptive texts below), the structure also provides a basis for the detailed learning of a particular discipline, such as System Architecture. Also, deliverable content can more easily be mapped to frameworks such as SEI-CMM, ISO 15504 or to the products of similar processes.



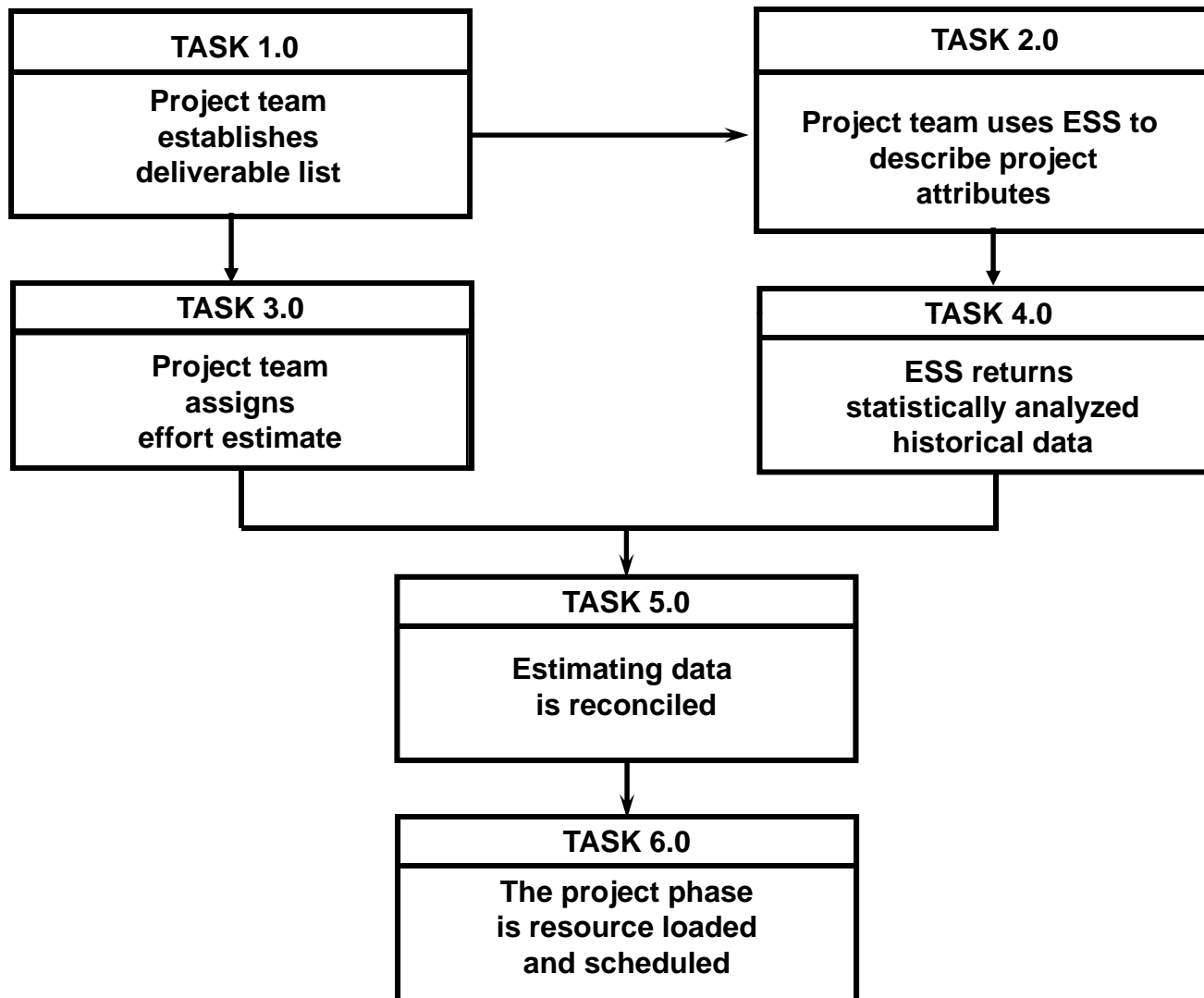
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Data Distribution



Typical Deliverable Frequency Distribution

High Level Process



Deliverable (WBS Element) Based Estimating

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Estimation Support System



ESS Home

- Deliverable-based Estimates
- Rough Order of Magnitude (ROM) Estimates
- Custom Queries
- Resume work on the following:

Select one of the existing work processes

Deliverable-Based Estimates, Step 1, 10/20/2006 5:30:34 PM

Delete

Note - All dates are displayed/entered using the format: 'MM/DD/YYYY'

Exit



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Estimation Support System



Deliverable Based Estimate (Step 1 of 6)

Identify Project

Describe Phase

Specify Deliverables

Analyze Historical Data

Finalize Effort Estimate

Obtain Output

Describe Project

Select an existing project:

OR

Create a new project.



Tool Operation



Estimation Support System



Deliverable Based Estimate (Step 1 of 6)



Update Project

Enter a value for the following project information. Mandatory fields *

* Project Name:	<input type="text" value="Inventory Automation Sy"/>
* Project Acronym:	<input type="text" value="IAS"/>
Planned Project Start Date:	<input type="text" value="01/07/2008"/>
Project Owner/Client:	<input type="text" value="I. M. Owner"/>
Parent Program:	<input type="text" value="Manufacturing"/>
Project Description:	<input type="text" value="Develop an On-Line Inventory System"/>
Application Type:	<input type="text" value="Inventory Control"/>
* Method:	<input type="text" value="ProdCentre/MgmtSuite 4.5"/>



Tool Operation



Estimation Support System



Deliverable Based Estimate (Step 2 of 6)

Identify Project | Describe Phase | Specify Deliverables | Analyze Historical Data | Finalize Effort Estimate | Obtain Output

Specify Attributes

Application Type: Inventory Control

* Phase Start Date: 04/15/2007

* Method: ProdCentre/MgmtSuite 4.5

* Path: Base Process

* Phase: Opportunity Evaluation

* Environment: Client Server

* Access Method: WEB

* Hardware: Undecided

* OS(...): Undecided
UNIX
Windows

* COTS(...): Undecided
Millenium
CATIA

* Language(...): Undecided
COBOL
Visual Basic

* Database(...): Undecided
Oracle
SQL Server

Comments (to be filled if "others" value has been selected):

* Mandatory attributes
(...) Attribute that can have multiple value (max 3)
Use CTRL to select multiple values

Re-use previous deliverables' list (if available)



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Estimation Support System



Deliverable Based Estimate (Step 3 of 6)



Specify Deliverables

Method : ProdCentre/MgmtSuite 4.5
 Path : Base Process
 Phase : Implementation

Deliverable	Phase	Path	Method	Qty	Delete
M001S Project Initial Understanding	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M002S Project Statement	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M007S Financial Plan	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M009S Detailed Plan	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M029S Assignment Description	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M030S Project Environment Requirements	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M032S Project Procedure	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M033S Project Procedures Register	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M036S Work Breakdown Structure	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M039S Individual Progress Report	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M040S Progress Report	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M041S Key Decision Log	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M042S Change Request	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M043S Problem	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M044S Change Request Log	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M045S Risk	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M046S Issue	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M047S Risk Log	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M048S Issue Log	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M049S Meeting Notes	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M050S Project Status Report	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M052S Deliverable Review and Approval	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M053S Deliverable Status Log	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M055S Product and Service Evaluation	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>
M057S External Provider Status Log	Management	ManagementSuite	ManagementSuite 4.5	1	<input type="checkbox"/>

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Estimation Support System



Deliverable Based Estimate (Step 3 of 6)

Identify Project | Describe Phase | **Specify Deliverables** | Analyze Historical Data | Finalize Effort Estimate | Obtain Output

Add Deliverables

Browse

Method:

Path:

Phase:

Deliverable:

Search

Search for:

Select a deliverable from the results list then click on Add

Custom Deliverable

Deliverables List

The following deliverables will be added.

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Estimation Support System



Deliverable Based Estimate (Step 4 of 6)

Identify Project

Describe
Phase

Specify
Deliverables

Analyze
Historical Data

Finalize Effort
Estimate

Obtain Output

Choose Parameters

Choose the statistical parameters for the selected historical data.

- Mean (μ)
- Median (50th percentile)
- Select First Optional Percentile:
- Select Second Optional Percentile:

Largest effort expended for a single occurrence (L) and sample size(N) are provided by default.



Tool Operation



Estimation Support System



Deliverable Based Estimate (Step 4 of 6)



Analyze Historical Data

Note - The results below are displayed as Heads-Down Labor Hours (except N)

Deliverable	Data from All Projects												Selected Historical Data
	Percentile						Percentile						
	μ	Med	30	70	L	N	μ	Med	30	70	L	N	
M002S-1 Project Statement	21	4	3	25	57	3	0	0	0	0	0	0	25
M009S-1 Detailed Plan	33	7	6	22	225	12	23	23	14	31	44	2	14
M050S-1 Project Status Report	9	3	2	5	37	9	0	0	0	0	0	0	5
M060S-1 Project Completion Report	24	24	20	27	32	2	16	16	16	16	16	1	27
P460S-1 Implementation Plan	150	31	11	64	1216	42	230	33	13	130	1216	25	33
P715S-1 Communication Material	0	0	0	0	0	0	0	0	0	0	0	0	20
P770S-1 Test Results	508	176	61	534	2910	54	452	136	28	513	2692	32	136
P805S-1 Implementation Report	117	36	14	127	819	29	126	40	13	175	819	23	40

Save Click here to save the historical data to an Excel spreadsheet.

Create New Profile...

Hint

Sample size (N):
■ 30 or +
■ 11 - 29
■ 10 or -



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Estimation Support System



Deliverable Based Estimate (Step 5 of 6)



Finalize Effort Estimate

Deliverable & Occurrence	Project Team Estimate	Selected Historical Data Estimate	Final Estimate	Basis of Estimate
CST-1 Inventory Control Quality Plan	<input type="text" value="25"/>	35.0	<input type="text" value="35"/>	Customer Estimate <input type="button" value="v"/>
P450S-1 Implementation Plan	<input type="text" value="15"/>	33.0	<input type="text" value="33"/>	Based on ESS Historical Data <input type="button" value="v"/>
P705S-1 Operations Guide	<input type="text" value="50"/>	50.0	<input type="text" value="50"/>	Project Team Estimate <input type="button" value="v"/>
P710S-1 Training Material	<input type="text" value="50"/>	42.0	<input type="text" value="42"/>	Based on ESS Historical Data <input type="button" value="v"/>
P715S-1 Communication Material	<input type="text" value="20"/>	20.0	<input type="text" value="20"/>	Project Team Estimate <input type="button" value="v"/>
P770S-1 Test Results	<input type="text" value="75"/>	120.0	<input type="text" value="120"/>	Based on ESS Historical Data <input type="button" value="v"/>
P805S-1 Implementation Report	<input type="text" value="35"/>	40.0	<input type="text" value="40"/>	Based on ESS Historical Data <input type="button" value="v"/>

Click here to save the historical data to an Excel spreadsheet.



Tool Operation



Deliverable Based Estimate (Step 6 of 6)



Select Output

On this page, you can save the output in the format that you prefer. You can create as many files (format) as you want. The file(s) that are saved include the list of deliverables and associated estimates. Click on "next" when finished, and go to the Menu page.

- Adobe - PDF

- SpreadSheet

- Text

- Microsoft Project

- Primavera



Rough Order of Magnitude Estimating

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Rough Order of Magnitude (Step 1 of 3)



Describe Project

Select an existing project:

OR

Create a new project.



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Rough Order of Magnitude (Step 1 of 3)

Describe Project | Analyze Historical Data | Obtain Output

Update Project

Enter a value for the following project information. Mandatory fields *

* Project Name:

* Project Acronym:

Planned Project Start Date:

Project Owner/Client:

Parent Program:

Project Description:

Application Type:



Tool Operation



Rough Order of Magnitude (Step 1 of 3)

Describe Project | Analyze Historical Data | Obtain Output

Specify Attributes

Application Type: Office Automation

*Planned Start Date: 03/17/2007

*Method: ProdCentre/MgmtSuite 4.5

*Path: Base Process

*Environment: Client Server

*Access Method: WEB

*Hardware: Non-MAINFRAME

*OS(...): UN*X

*COTS(...): None

*Language(...): Java

*Database(...): Oracle

Comments (to be filled if "others" value has been selected):

* Mandatory attributes
(...) Attribute that can have multiple value (max 3)
Use CTRL to select multiple values



Tool Operation



Estimation Support System



Rough Order of Magnitude (Step 2 of 3)

Describe
Project

Analyze
Historical Data

Obtain Output

Choose Parameters

Choose the statistical parameters for the selected historical data.

- Mean (μ)
- Median (50th percentile)
- Select First Optional Percentile:
- Select Second Optional Percentile:

Largest effort expended for a single occurrence (L) and sample size(N) are provided by default.



Tool Operation



Estimation Support System



Rough Order of Magnitude (Step 2 of 3)

Describe Project | **Analyze Historical Data** | Obtain Output

Analyze Historical Data

Note - The results below are displayed as Heads-Down Labor Hours (except N)

Phase	Data from All Projects						Profile 1	Data from All Projects						Selected Historical Data
	μ	Med	20	75	L	N	μ	Med	20	75	L	N		
OE - Opportunity Evaluation	94	180	80	145	689	7	102	228	64	255	689	4		
PA - Preliminary Analysis	1921	3067	990	3772	24693	43	1921	3445	1251	3301	24693	29		
A - Architecture	2312	4060	749	4102	41770	44	2510	4221	763	4237	41770	32		
RDC - Design and Construction	1931	4705	687	5401	46142	132	2426	5062	1119	5975	42133	79		
IM - Implementation	581	1037	185	1125	8594	53	934	1089	201	1264	5818	33		

Save Click here to save the historical data to an Excel spreadsheet.

Create New Profile...

Hint

Sample size (N):
■ 30 or +
■ 11 - 29
■ 10 or -



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Rough Order of Magnitude

Describe
Project

Analyze
Historical Data

Obtain Output

Select Output

On this page, you can save the output in the format that you prefer. You can create as many files (format) as you want. The file(s) that are saved include the list of deliverables and associated estimates. Click on "next" when finished, and go to the Menu page.

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Custom Queries

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Custom Query

Describe your custom query

Can you provide me with historical effort data for our maintenance project from the last three block points.

Send to ESG

The ESG will send a response to you within 2 working days.
Please contact the ESG for more information.



Summary

- **Structured methodologies with standardized work breakdown structures (WBS) are well situated for data collection, analysis and estimating support**
- **Large data bases are critical in establishing any type of confidence in the historical data**
- **An understanding of basic statistical analysis is very important**
- **Analysis of variance is the logical next step in discovering additional cost-driving attributes**

Questions

