

The Challenges of Software In-Service Estimating

SCAF Workshop
12th April 2011

The Model

Name

Comment

Run Reference

Tactical Management Yes

Age This Year

Users

Help Desk Provided Yes No

Confidence Lin

Introduction

Summary

- Introduction to the Software Support Cost Model
- The Challenges
- Software Support Cost Model Approach
 - Data Collection
 - Data Analysis
 - The Results
- Conclusions



Software Support Cost Model (SSCM)

- SSCM began over 15 years ago.
- SSCM was developed, issued and supported by BMT Reliability Consultants under contract to CAAS and its predecessors.
- The Software Support Cost Model (SSCM)
 - To understand what is meant by software support
 - To quantify the costs and the cost drivers and thereby gain control
 - Founded wholly on UK specific data
- The current model is in regular use throughout DE&S community to predict the cost of system software support.
- As software does not stand still and because SSCM model takes snapshots in time, annual data collection exercises are necessary to keep the data up-to-date.

The Challenges

Acquisition costs and risks are a small part of the Whole Life Cost. Software Support risks and costs are much more difficult to predict.

SSCM Challenges

- Software does not stand still.
- Software support is not visible in contract deliverables.
- Continuity of access to software data.
- Metrics, Data Collection and Modelling.

SSCM Approach - Data

Data Collection

- Phone and Email and Interview for issuing Software Data Forms (Questionnaire)
 - Summary Data
 - Software Characteristics
 - Usage
 - Support/ Support Demands
 - Cost of Software Support
 - Comments and Project Description
- Data prepared for suitable analysis
- Maintain Project Contact Database of Project Teams (100+)

CODE	
A	Informat
B	Informat
C	Informat
D	Training
E	Testing
F	Commur
G	III



SSCM Approach - Analysis

Data Analysis

- Principal Analysis tool was MINITAB - a Statistical Software Package
 - Best sub-set
 - Regression analyses
- Best Subset is a method to help determine which variables should be included in the regression analysis
- Regression analysis is a statistical tool for the investigation of relationships between variables.
- Spreadsheet Software to demonstrate (pictorially) the quality of fit
- Independent DASA review

R denotes an observation with a large standardized residual

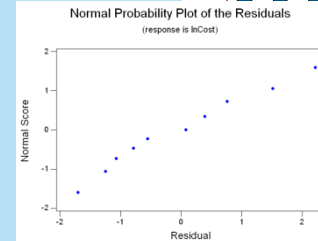
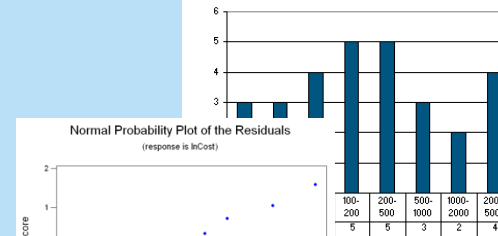
Best Subsets Regression: Cost versus Age08, IHS, SOUP, W

Response is Cost

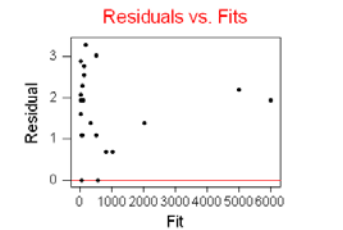
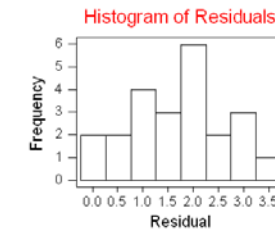
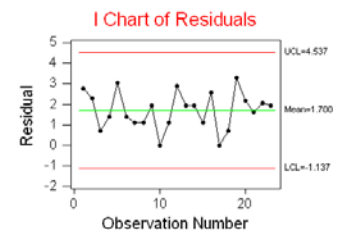
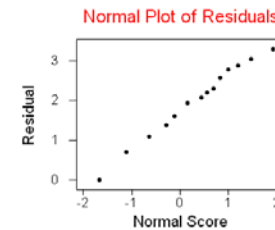
A
g S W
e I O a
O H U r
S 8 S P F

1921.0	X
2053.6	X
1938.0	X X
2017.7	X X
2047.0	X X X
2055.5	X X X
2187.7	X X X X

KSLOC



Residual Model Diagnostics



Picture Reference: Minitab Statistical Software Release 13, example SSCM data set

SSCM Approach - Results

SSCM Model (2009)

- Two subset relationships.
 1. War Fighting
 2. Non – War Fighting

(if failure of the software would critically affect the mission e.g., terminate it.)
- Significant Variables
 - Age
 - Size
 - Safety Critical
 - SOUP
 - Application Type

Model Issue

- Offered free of charge to project teams in the UK Ministry of Defence
- Issued on a CD with documentation
- Provision for accompanied visits to demonstrate the use of the model

The Software Support Cost Model (SSCM)

Existing Model v3.0.0

The tool is unique: because the model is built on recent snapshots taken from a large range of military systems, it reflects what actually happens in practice for in-service military software.

Software Support Cost Model v3.0.0

[About](#) [Help Desk](#) [The Model](#) [Guidelines](#) [Test Data](#) [History](#)

[Project Details](#) [Name](#) [Classification](#)

[Comment](#) [User, Organisation](#)

[Run Reference](#)



[War Fighting](#) Yes No

[Model Data](#) [SOUP](#) Yes No [Application Type](#)

[Safety Critical](#) Yes No [Size](#)

[Age This Year](#)

[Model Results](#) [No. of Years](#) [Confidence Limits](#)



Cost Assurance and Analysis Service (CAAS)

The Software Support Cost Model (SSCM)

<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>		
Software Support Costs for				
Model Data				
War Fighting	No			
Age This Year	6			
Application Type	Information System - Management (MIS)			
Size (K lines)	N/A			
Safety Critical	N/A			
SOUP	No			
Annual Cost (excl. VAT) in 2010/2011 values.				
Year	FY	Low (10%)	Point	High (90%)
6	2010	£12k	£51k	£214k
7	2011	£14k	£58k	£241k
8	2012	£16k	£65k	£272k
Generated from SSCM 3.0.0 by test123 on Tuesday, March 1, 2011 at 09:59:38				
Printing Saving Results Graph Plots Sensitivity Analysis Calculated Costs				
<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>

SSCM in a Changing Commercial World

Commercial World Challenges

- Software does not stand still
- Software support is likely to become less visible in contracts
- Access to software data and support costs will become more difficult
- Ownership and Application of the data and techniques will become less clear
- New equipment and support practices will require new models

Conclusions

- **There is no certainty that there exists a universal law concerning software support costs: if it does exist, it has not yet been identified despite the years of analyses undertaken on different data sets.**
- **Software Support Cost Model directs effort to model what happens rather than seeking the universal law.**
- **In a changing commercial world, access to, and identification of, software support costs is likely to become more difficult.**
- **The SSCM fulfils a need now: will that need continue into the future more commercialised support environment?**

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