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by PRICE® Systems

Systems Cost Engineering

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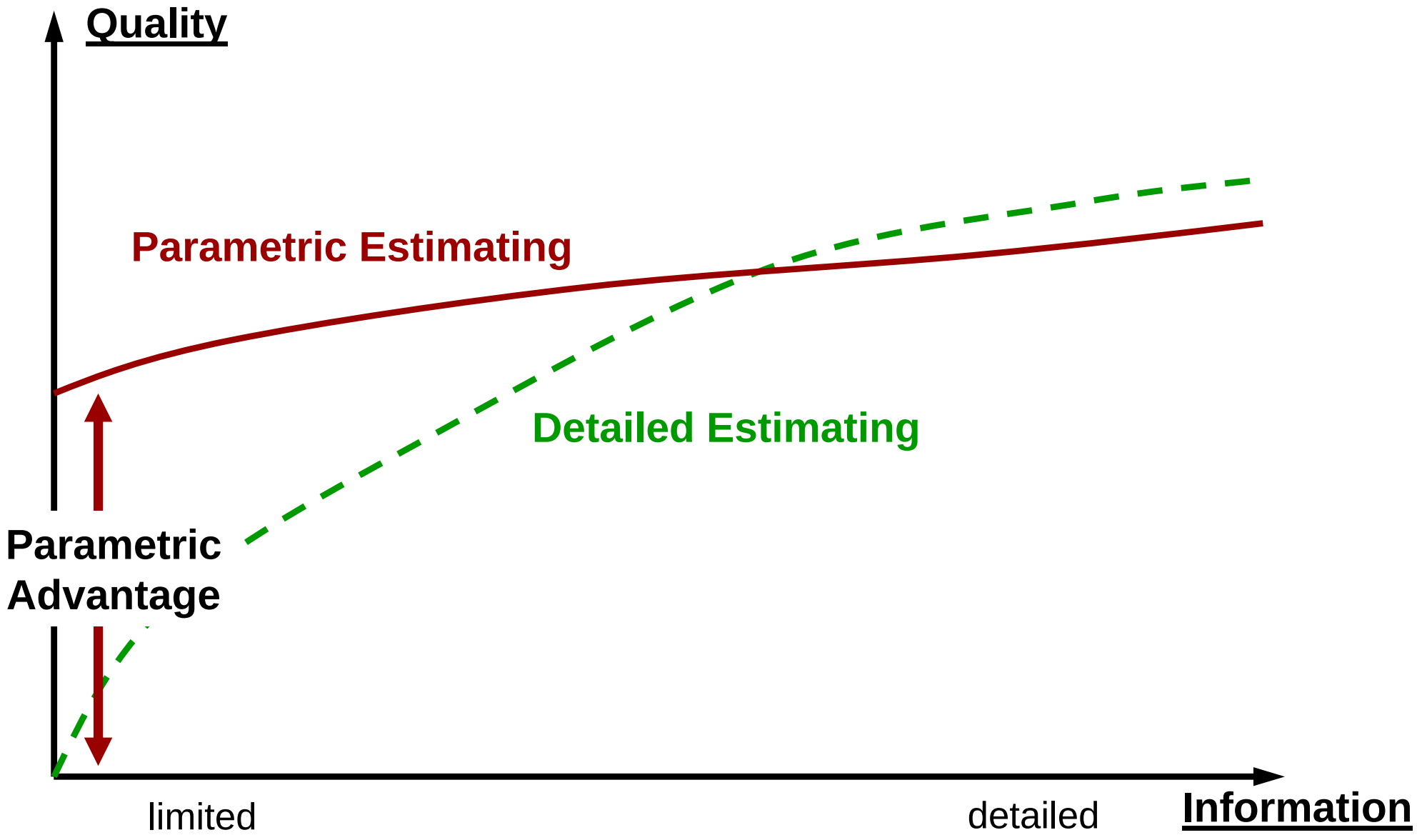
Contents

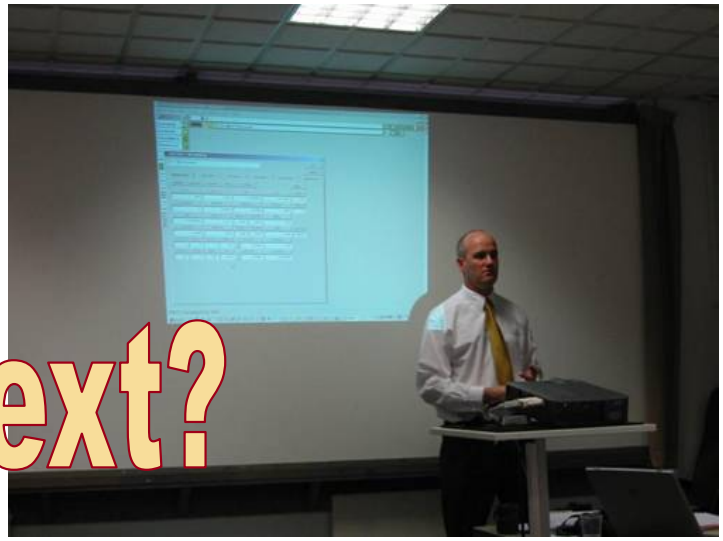
Why parametrics?



So you completed the course

I've learnt;

- **Creating a project**
- **Building Product Breakdown Structure**
- **Input parameters**
- **Output results**
- **Creating charts**
- **Functional relationships**
- **Escalation and labour rates**
- **Risk Analysis**



What next?

Start-up plan

Implementation Plan

- Introduction within the organisation
- Products, Technologies and Processes
- Cost Structure
- Economics
- Areas not covered by the model
- Historical Technical data
- Collection of historical cost data
- Product Calibration
- Organisational Calibration
- Parametric Questionnaire
- Modelling Techniques
- Information Network

Calibration and Analysis Plan

- Calibration Data gathering
- Calibration of product or programme factors
- Generation of average industry calibration factors
- Calculation of Calibration Factors
- Organisational Calibration

Its purpose is to accelerate usage and focus competence

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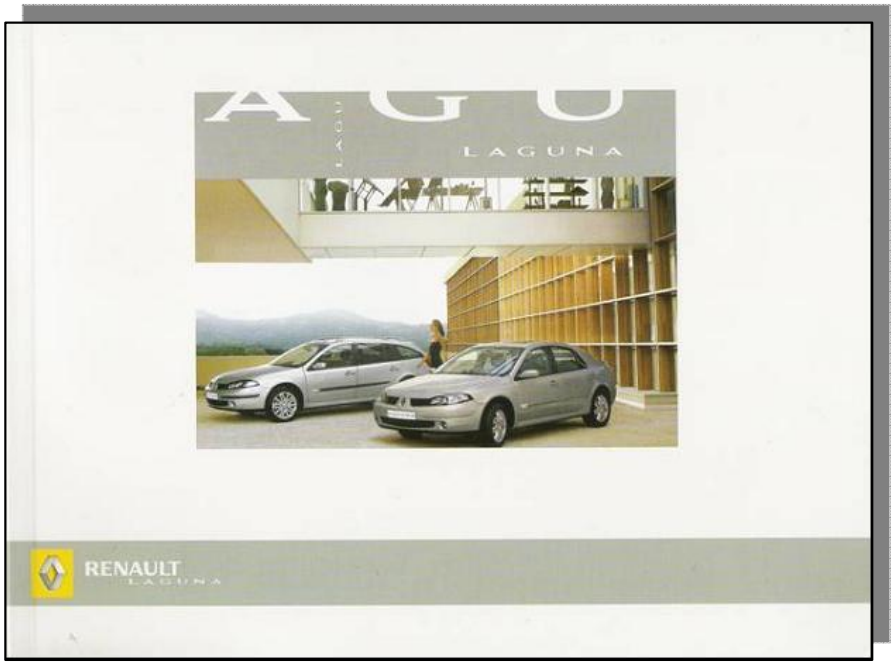
OK, so you can estimate!

- **'Should' cost – use the parametric cost model un-calibrated**
- **'Would' cost – use the parametric cost model calibrated**
- **Independent Schedule – predict project activity durations**

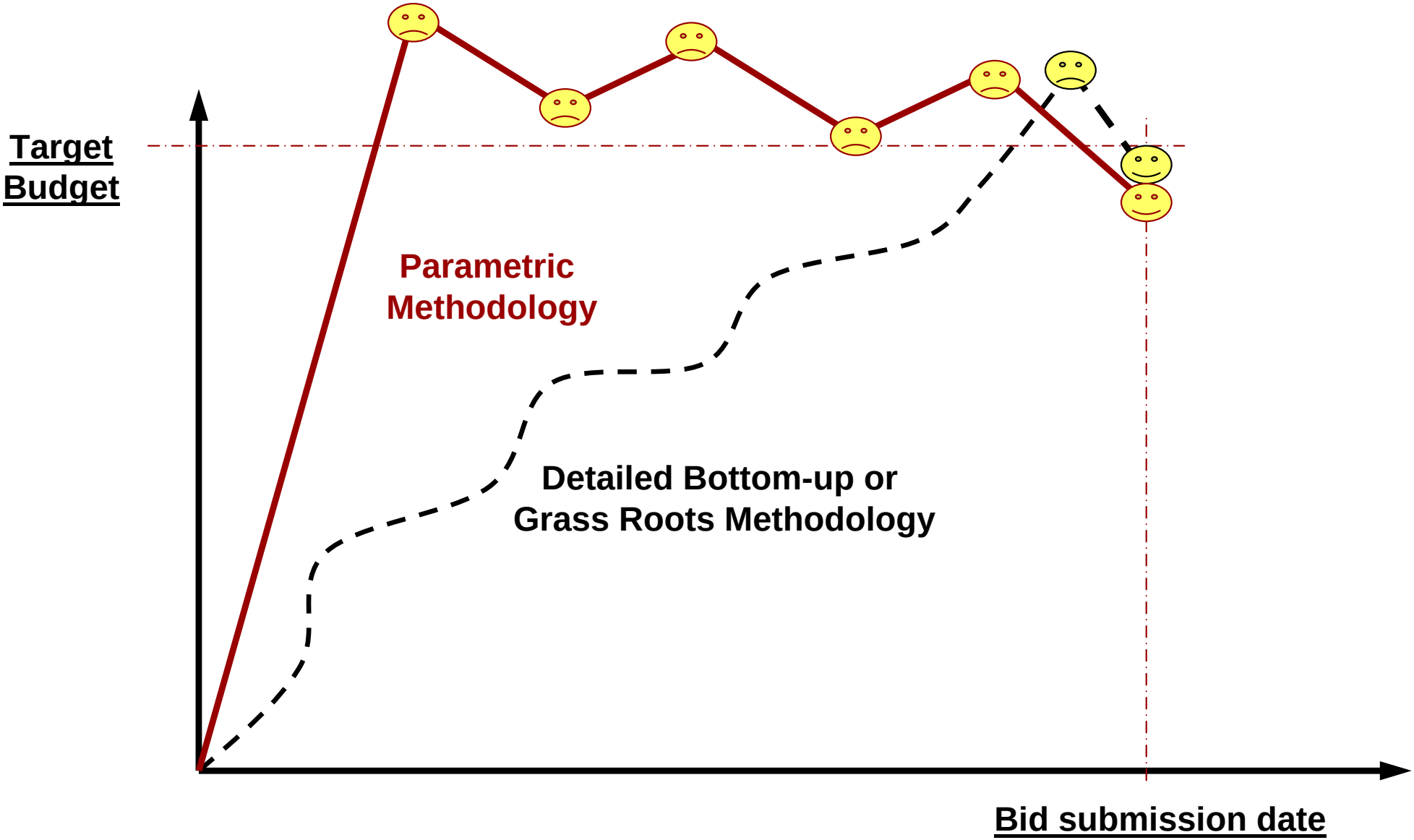
You've learnt how to Drive

Like the manual that comes with your new car



- In an emergency? - Help
- What fuel you need? - Windows XP
- Where are the controls? - the menu system
- Starting/stopping the engine? - opening/closing files
- The dashboard? - icons on the toolbar

Accelerated Bidding with more opportunity to review and influence decisions



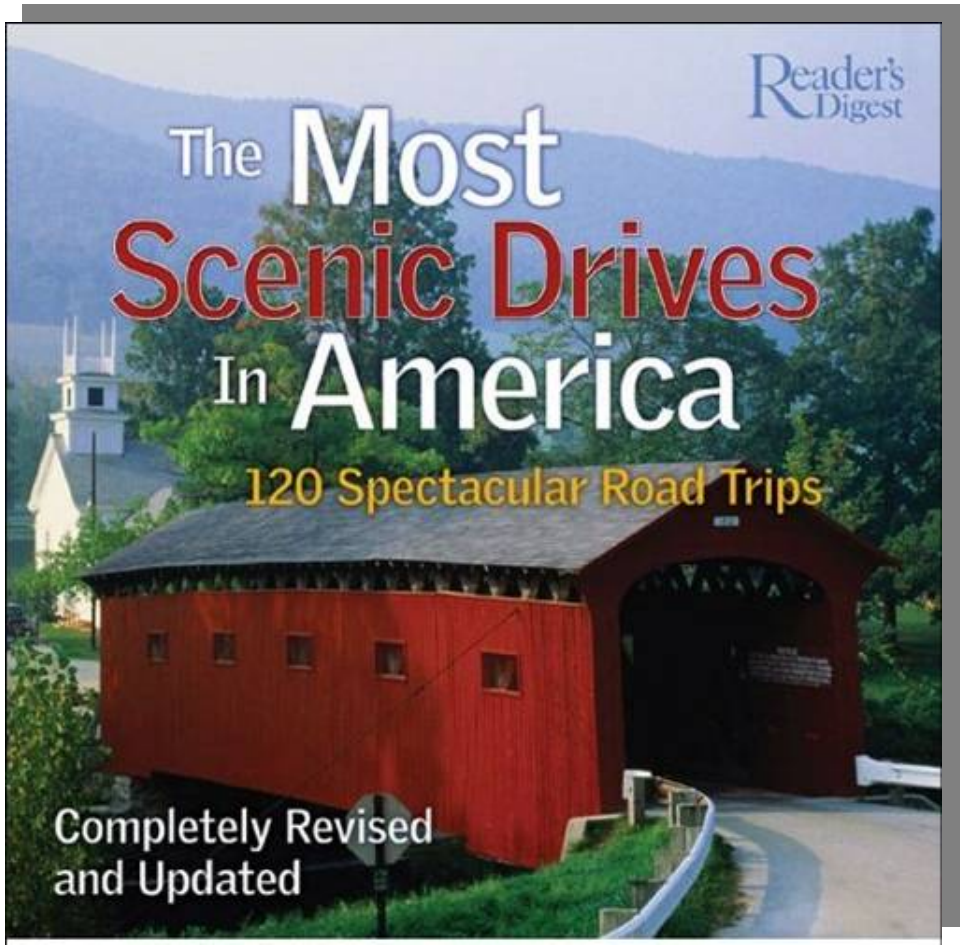
What else can I do with my new estimating knowledge and skills?

Where are the interesting places to drive?

There are many good places to drive parametrics!

Parametric estimating solutions:

- **Complete estimate**
- **Bid/No Bid decisions**
- **Knowledge database**
- **Cost validation (Supplier Assessment)**
- **Value engineering/Design To Cost (DTC)/ Cost As an Independent Variable (CAIV)**
- **Inputs to project management**
- **Make/Buy analysis**
- **Budget forecasting**
- **Risk analysis**
- **Cost estimation/Proposal management**
- **Systems and software system acquisition and maintenance**
- **And more…**



Source: www.Amazon.com

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Source of inspiration

- The classroom at PRICE House, Hook, UK
- 24 years of PRICE Symposiums
- 302 Papers
- 121 different organisations

‘Systems Cost Engineering’ Book; How to apply parametrics to…..

- Introduction
- How to appreciate Parametrics
- How to estimate using parametrics
- How to prepare bids faster with fewer resources
- How to Prepare a focused Business Plan
- How to validate quotations from suppliers
- How to manage your program effectively
- How to achieve accuracy in Cost Engineering
- How to accomplish Quality Assurance
- How to estimate Through Life
- How to estimate technology maturity
- How to assess software
- How to analyse risk and uncertainty
- How to influence project strategy
- How to consider Technology Insertion
- How to develop cost effective alternatives
- How to tackle the System of Systems Challenge
- How to create home-grown parametric models
- How to successfully conduct Life Cycle Costing
- How to accomplish knowledge retention
- How to present the results
- How to adopt parametrics
- The History of Parametrics Estimating

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Contributors to 'Systems Cost Engineering'

Didier Barrault – France

Anthony DeMarco – USA

Fabian Eilingsfeld - Germany

Bruce Fad – USA

Pascal Gendrot - France

Grahame Jones – UK

Robert Kennedy – USA

John Long – USA

Emmanuel Mary - France

Bill Mathis - USA

Jeff Murphy – USA

Bob Green – USA

Kevin McKeel – USA

Arlene Minkiewicz - USA

Jim Otte – USA

Peter Pizzutillo – USA

Shamraz Razzaq – UK

Larry Reagan – USA

David Seaver - USA

Dale Shermon – UK

Pete Stanley – USA

Georges Teologlou – France

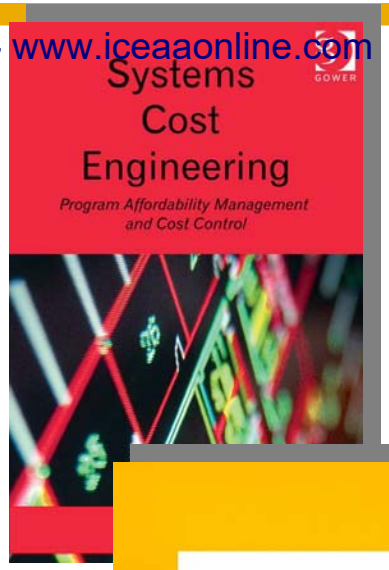
Ron Dias – USA

Zach Jasnoff - USA

Compiled by Dale Shermon

How to……..

The True Methods which apply Parametric Solutions to business problems



Graphical User Interface (GUI) Guide Manual

A detailed description to run model user interface.

Software Reference

The complete reference manual of inputs, outputs and functional relationships

Hardware Reference

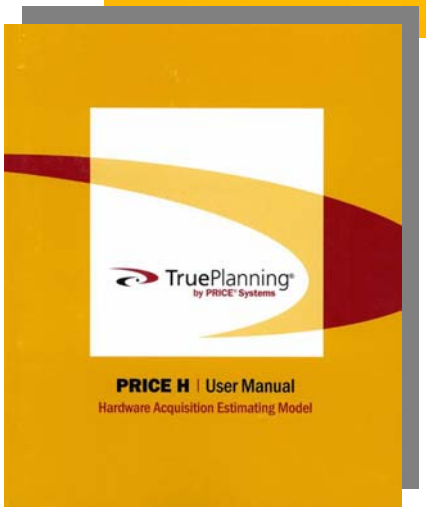
The complete reference manual of inputs, outputs and functional relationships

IT Reference

The complete reference manual of inputs, outputs and functional relationships

Other References

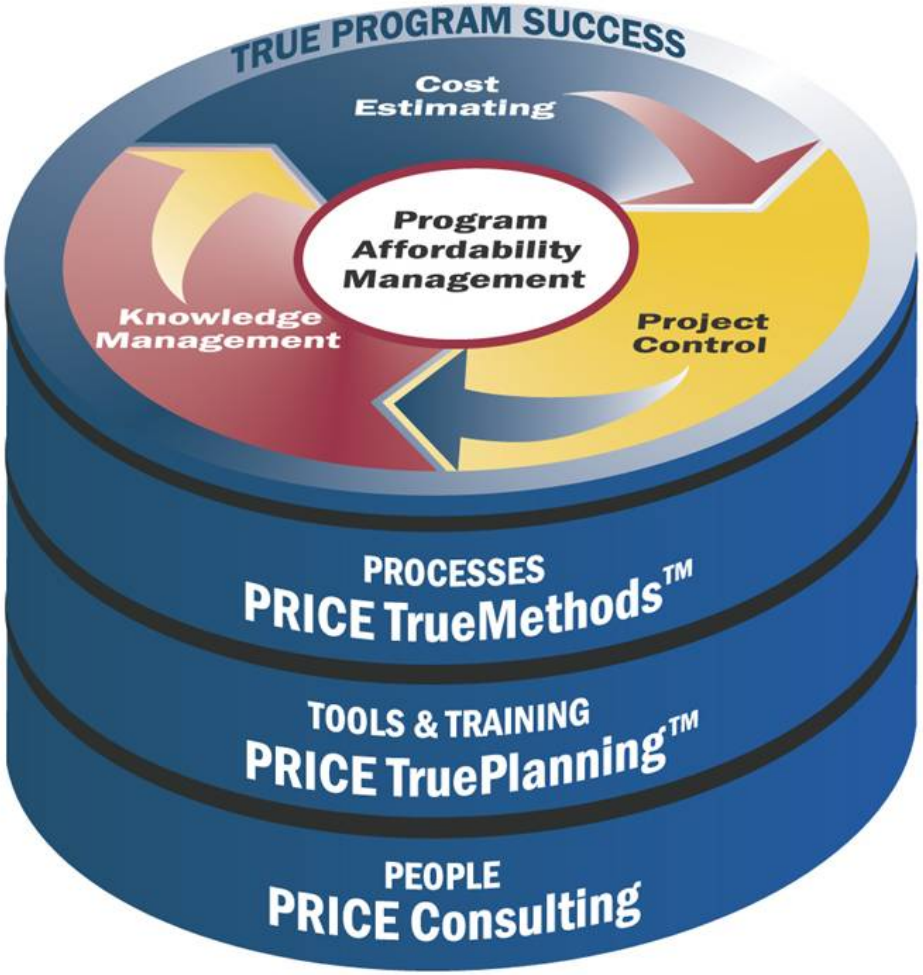
The complete reference manual of inputs, outputs and functional relationships



Why do we have projects which become a problem, but start with good intentions?

Source: M4 motorway between Bristol and Reading, UK

Program Affordability Management



- **TrueMethods: These are the processes which are applications of a cost model taught by experts and applied by your staff.**
- **TruePlanning: It is a cost model framework which you can apply in numerous applications with the right training and experience.**
- **Parametric Consultants: experts are able to customise standard processes and training, to suit your environment, with models that relate directly to your organisation.**

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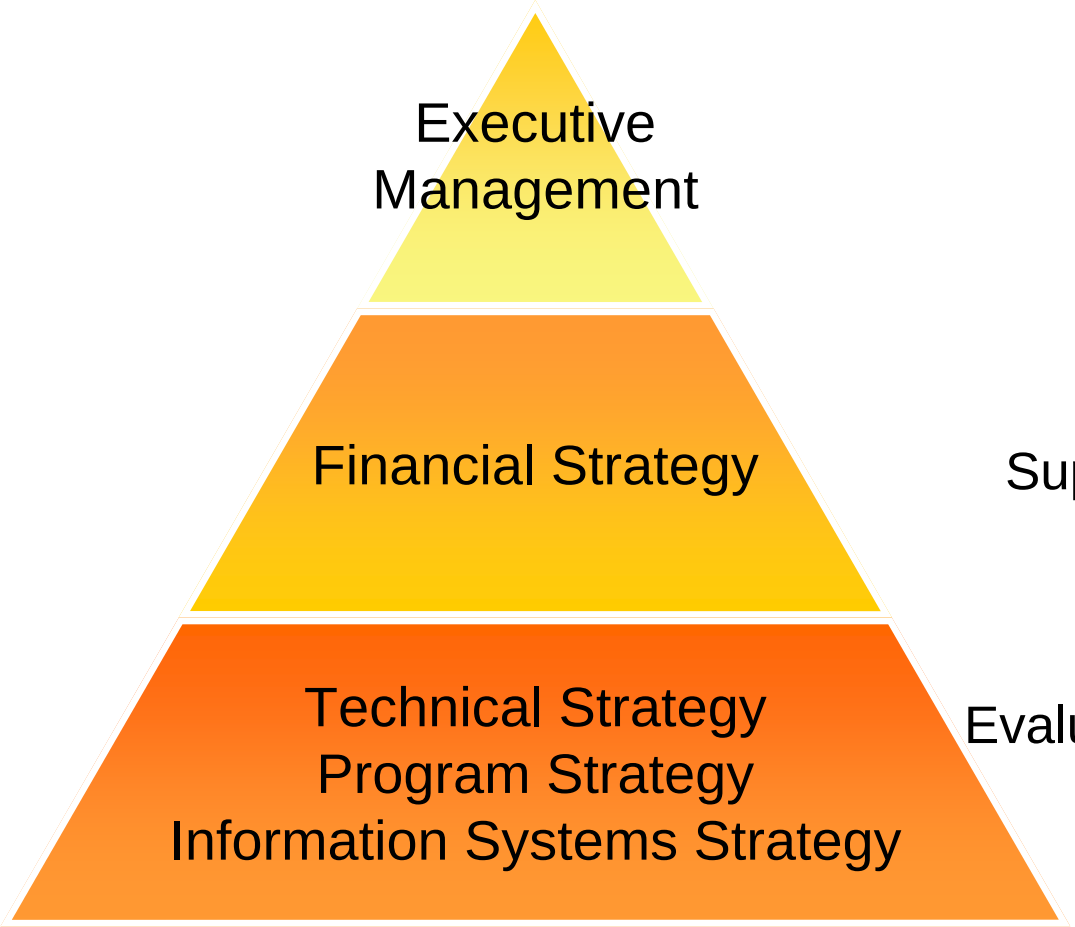
Parametrics has solutions for all levels of an organisation

Examples

Decision Support



Bid / No-Bid
Market Strategy

Budgeting
Financial Control
Procurement

Capacity Analysis
Supplier Assessment
Risk Analysis

Delivery

Evaluating Alternatives
CAIV
Make / Buy
EVMS

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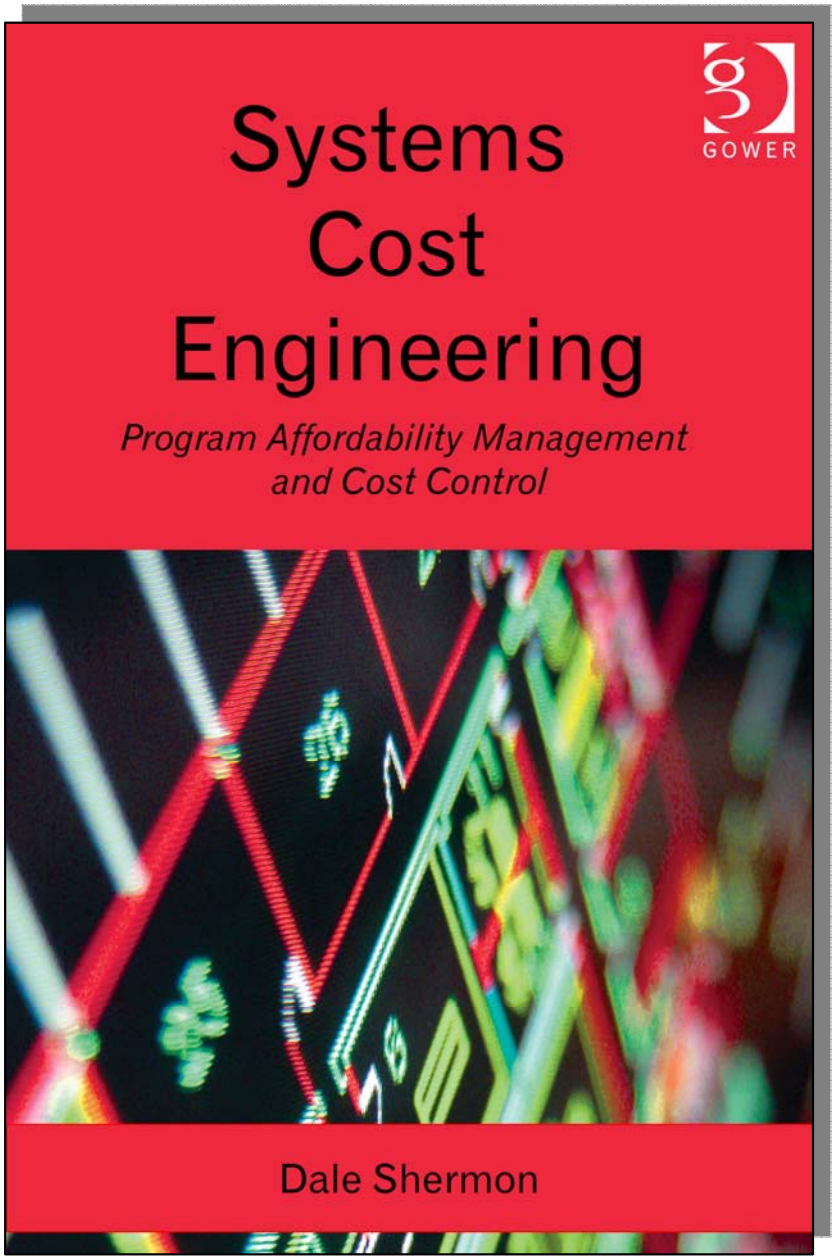
Systems Cost Engineering will help cost engineers, the project and program directors, and champions that support them, to understand and apply parametrics to ensure that their programs:

1. **offer a credible analysis of alternative cost options;**
2. **are never initiated with insufficient funding because of inaccurate estimates of cost or quantification of risks;**
3. **are never diverted from their objective because of a lack of credible cost management;**
4. **share and communicate knowledge of realistic and dynamic cost and productivity metrics amongst the program team;**
5. **are never derailed by surprise cost overruns or schedule delays.**



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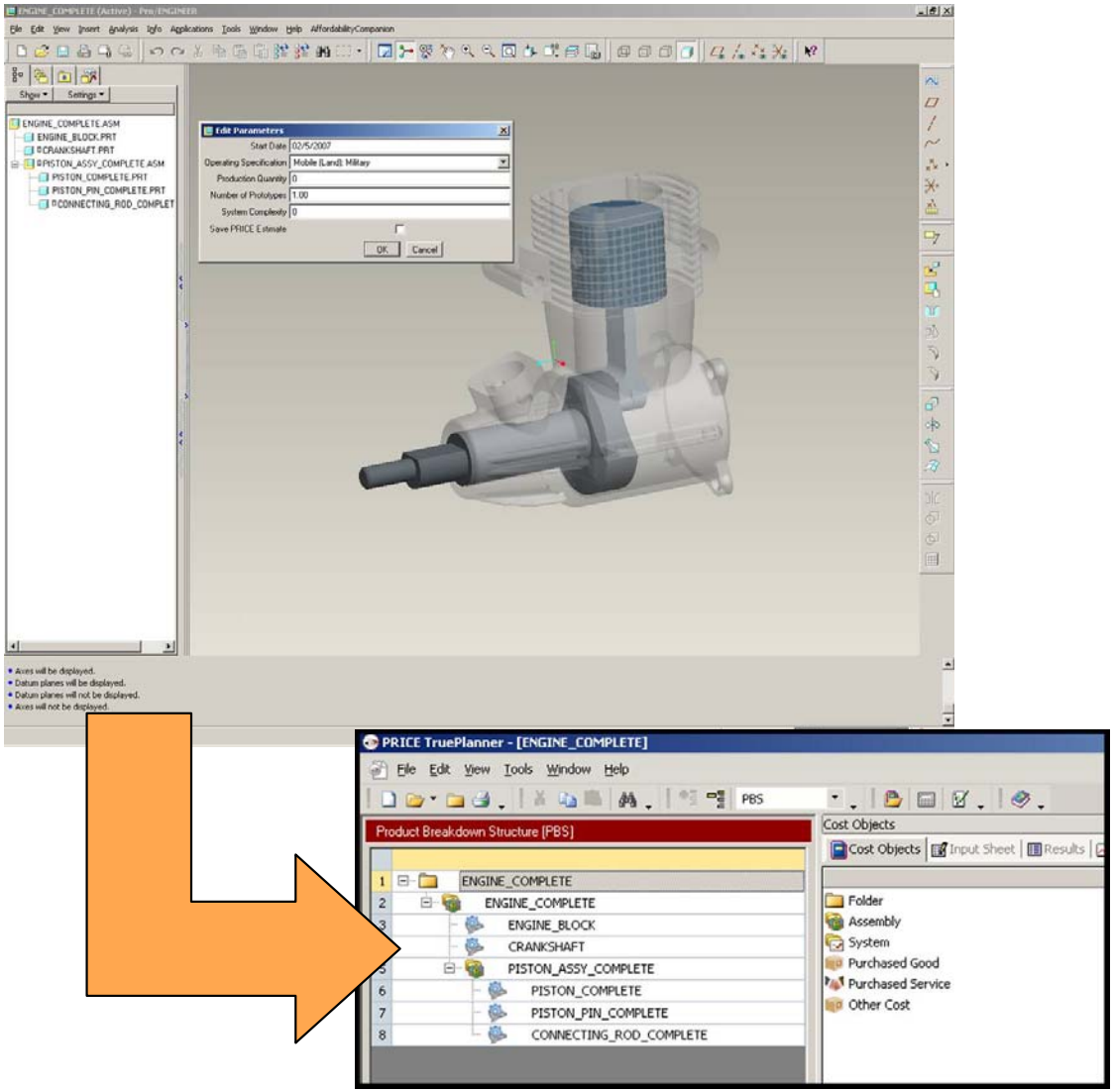
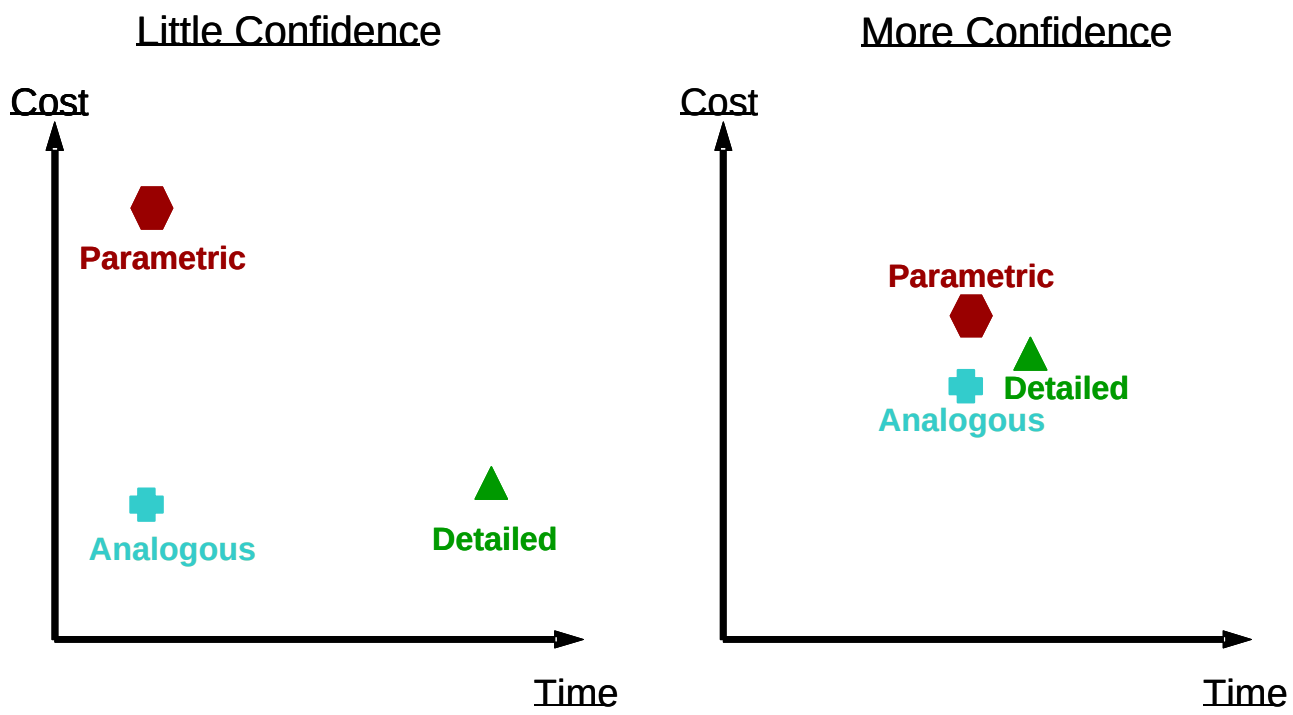
1. **Will help cost engineers ensure that their programs offer a credible analysis of alternative cost options;**

- **Focused Business Plan**
- **Estimating Technology Readiness Level (TRL)**
- **Estimating Software**
- **Considering Technology Insertion**
- **Systems of Systems challenge**
- **Cost As an independent Variable (CAIV)**
- **Successful Life Cycle Estimating**



Systems Cost Engineering



2. **Will help cost engineers to understand and apply parametrics to ensure that their programs are never initiated with insufficient funding because of inaccurate estimates of cost or quantification of risks;**

- **Preparing bids faster with fewer resources**
- **Achieving accuracy**
- **Accomplishing Quality estimates**
- **Analyse risk and uncertainty**
- **Considering Technology insertion**
- **Creating home-grown models**

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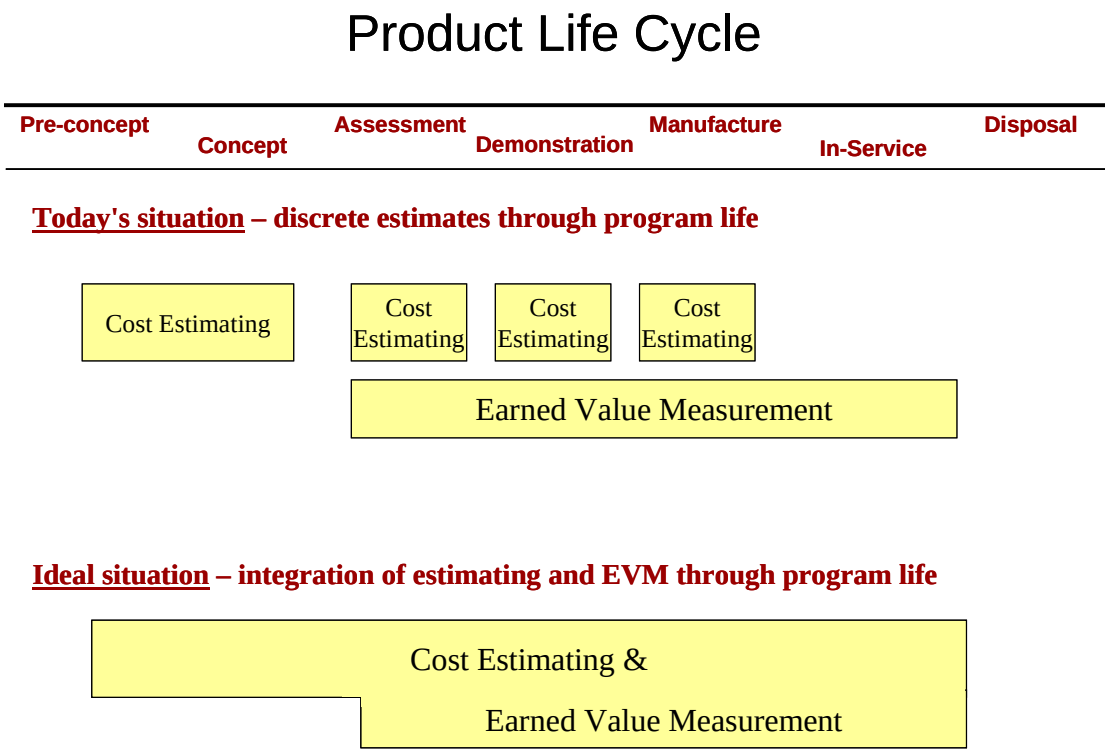
3. **Will help cost engineers to understand and apply parametrics to ensure that their programs are never diverted from their objective because of a lack of credible cost management;**

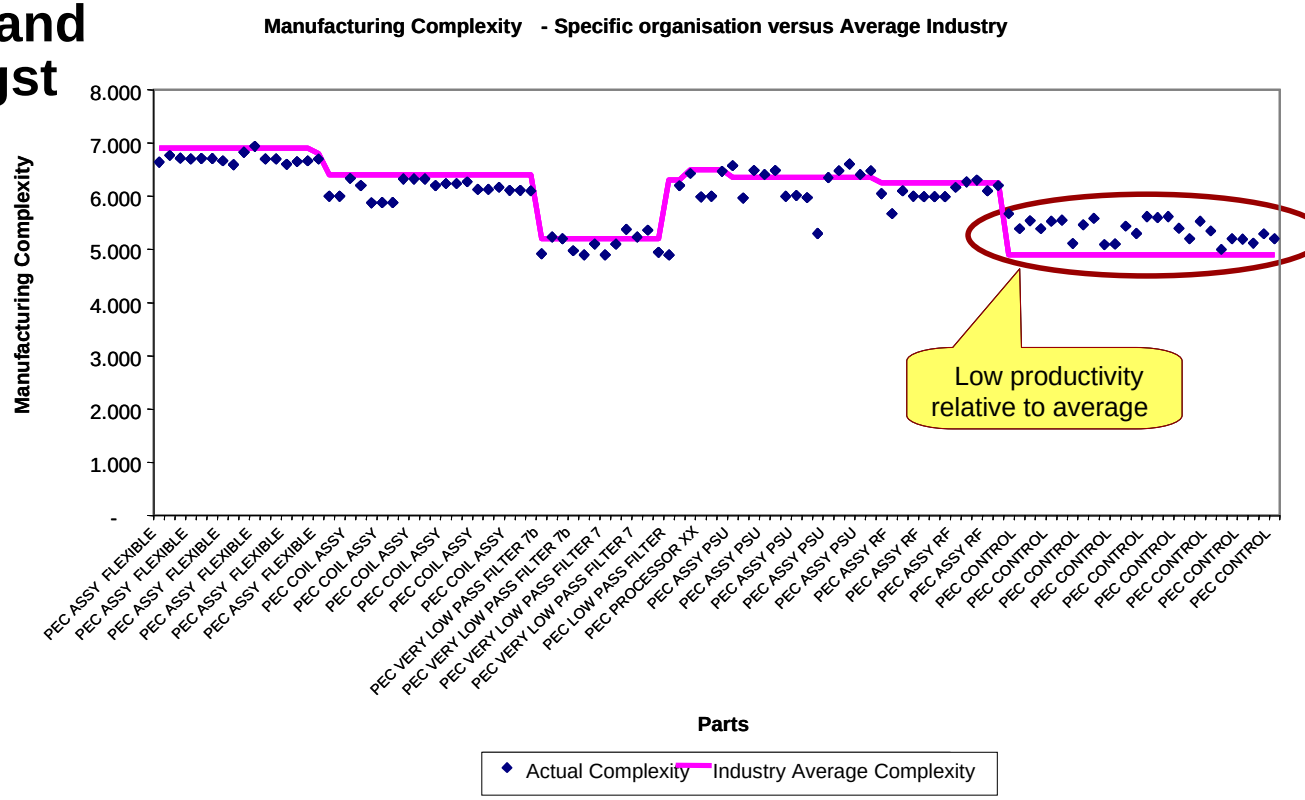
- **Focused Business Plan – competitor assessment**
- **Predictive Earn Value Management (P-EVM)**
- **Estimate Through Life**
- **Consider Technology Insertion**
- **Systems of Systems Challenge**
- **Successful Life Cycle Costing**



Systems Cost Engineering

4. **Will help cost engineers to understand and apply parametrics to ensure that their programs share and communicate knowledge of realistic and dynamic cost and productivity metrics amongst the program team;**

- **Focused Business Plan - productivity tracking**
- **Achieving accuracy in cost engineering**
- **Assess Software**
- **Creating home-grown parametric models**
- **Accomplishing Knowledge Management**



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5. **Will help cost engineers to understand and apply parametrics to ensure that their programs are never derailed by surprise cost overruns or schedule delays;**

- **Supplier Assessment**
- **Influencing Acquisition Strategy**
- **Estimating technology maturity (TRL)**
- **Consider technology insertion**
- **Successful Life Cycle Costing**
- **Presenting the results**

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Utilise your parametric skills!

1. Credible Analysis of Alternatives
2. inaccurate initial estimates and quantification of the risks
3. lack of credible cost analysis within the Program's Management
4. knowledge of cost and productivity metrics
5. surprise cost overruns and schedule delays

Prepare bids faster with fewer resources				■	
Prepare a focused Business Plan			■		■
Validate quotations from suppliers	■				
Manage your program effectively			■		
Achieve accuracy in Cost Engineering	■	■		■	
Accomplish Quality Assurance				■	
Estimate Through Life			■		
Estimate technology maturity	■			■	■
Assess software	■	■		■	■
Analyse risk and uncertainty				■	
Consider Technology Insertion	■		■	■	■
Develop cost effective alternatives					■
Tackle the System of Systems Challenge	■		■	■	■
Create home-grown parametric models	■	■		■	■
Successfully conduct Life Cycle Costing	■		■		■
Accomplish knowledge retention		■			
Present the results	■				

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Nearly finished!

Summary

- **Parametric estimating is applicable when little information is available; less resources consumed and quicker than other estimating methods**
- **Parametric estimating training is the end of the course and the beginning of providing solutions to many complex estimating questions**
- **Many applications of the parametric estimating methodology have been captured in past Symposium papers**
- **Apply your estimating skills today! use them or loose them**
- **'Systems Cost Engineering' publisher by Gower documents and captures many of the applications**

http://www.ashgate.com/default.aspx?page=637&calcTitle=1&title_id=10334&edition_id=11500

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Any questions?

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Back-up slides

Systems Cost engineering published by Gower (part of Ashgate Publishing)

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Systems Cost Engineering

Program Affordability Management and Cost Control

Dale Shermon

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Cost estimating for major engineering hardware, software, service and IT projects is critical for ensuring a realistic evaluation of the project or program, to assess its affordability, and for managing the ongoing costs realistically. Traditional cost engineering methods are time consuming, expensive and unscientific. Organizations are increasingly turning to parametrics as a means of managing cost and program affordability. Dale Shermon's Systems Cost Engineering is based on over 25 years of personal experience and 350 years of joint experience within the team of the application of cost engineering principles in large engineering and aerospace projects and IT/Business transformation projects in financial services. Each chapter explores a different application of parametrics, based on real-life case examples and provides the reader with a detailed guide to the rationale and value of cost engineering in a different industry/program context.

Systems Cost Engineering will help cost engineers, the project and program directors, and champions that support them, to understand and apply parametrics to ensure that their programs:

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