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CHAIRMAN'S ADDRESS



The Summer Olympics and Paralympics, the Open Golf Tournament, success in the Tour de France, the Queen's Diamond Jubilee, Glorious Goodwood and - an improvement in the weather all gave rise to enhancing the summer feel good factor - what more could we ask for? The end of August sees the end of another very successful Society year. With over 300 delegates attending our workshops, excellent venues and some fantastic feedback from our members this shows once again that we are achieving all the objectives of the Society in sharing and promoting best practice in cost forecasting.

This year following the Annual Conference last September we held workshops in February, April and June and a Summer Reception in July. We also supported the Associated of Cost Engineers (ACostE) conference in November, the joint International Society for Parametric Analysis (ISPA)/Society for Cost Estimating and Analysis (SCEA) Conference in Brussels and the joint Space Systems Cost Analysis Group (SSCAG)/European Aerospace Cost Engineering (EACE) Working Group who held a two day meeting following the ISPA/SCEA conference.

I would like to record my thanks to all the committee members for the organisation and support given to the Society over the past 12 months.

The Society election process is now in full swing and the results will be announced at our Annual Conference.

Inside this edition you can find feedback reports on our workshops –

April 2012 – **“Cost Model Development”**: the SCAF 2012 Cost Estimating Challenge

June 2012 – **“Estimating for Partnering and Service Provision”**

July 2012 – **“Summer Workshop and Reception”** held at the At-Bristol Science and Discovery Centre

Also included is an article on **“Uncertainty in Competitive Bidding”**– using the cost forecast for pricing”, Drs Melanie Kreye, Linda Newnes and Yee Mey Goh discuss implications from research to industry.

Many of you are also aware of the proposed merger of ISPA and SCEA to create a new organisation to be named as the International Cost Estimating and Analysis Association (ICEAA). These two organisations have moved closer and closer over several years and have now published formal voting papers to their members. We look forward to the results with interest.

Looking forward to our 2012/13 year and our next event is the Annual Conference on Tuesday 18th September 2012. The conference theme is **“Forecasting for Success”** and our speakers have a wealth of experience with the implications and challenges facing major projects. They provide a knowledgeable body of expertise and learning experiences to the interest of all the attendees. Further details on the event can be found overleaf.

We look forward to seeing you all at the conference and at our workshops throughout the year.

Arthur Griffiths

SCAF Chairman

SCAF Annual Conference

“Forecasting for Success”

Tuesday 18th September 2012
The BAWA Centre, Filton, Bristol

In May 2012, the NAO published its report on “Assurance for Major Projects” and stated that central government’s major projects are frequently large scale, innovative, reliant on complex relationships between diverse stakeholders, and high risk. Government must find ways to avoid repeating the poor performance which has led to previous high profile project failures. Our conference speakers have a wealth of experience with the implications and challenges facing major projects and will provide a knowledgeable body of experience and learning experience to the attendees.

09.00 Registration and Coffee

09.45 Welcome and Opening Remarks - Arthur Griffiths, Chairman, SCAF

10.00 “MoDs Planning Round Equipment Procurement Plan – Independent Cost Estimates”, Dr Tim Sheldon – Head of Cost Assurance & Analysis Service, Defence Equipment & Support, Ministry of Defence

The presentation will show our recent work on the Planning Round Equipment Procurement Plan (EPP) – Independent Cost Estimates (PR-ICE). Dr Sheldon will talk about our realistic forecasting for both the EPP and future support for Equipment Support Plan (ESP).

10.40 “Value Trade-Offs”, Dr Stuart Wicks – Head of Business Analysis, Rolls-Royce plc

Increasingly, success is defined not just by delivering hardware but by creating and sustaining high value capabilities. Defence programmes on both sides of the Atlantic have been criticized for focusing too much on hardware delivery and not enough on value outcomes, sometimes long after the original requirement has become obsolete. This presentation provides some solutions to these problems with techniques that can unpick the question of real value and help achieve stakeholder consensus on trade-offs that optimize value-for-money rather than simply cost.

11.20 “How does one get novel project estimates right before it’s too late?”, Dr Andrew Tyler CBE – Chief Executive Officer, Siemens Marine Current Turbines Ltd and former Chief Operating Officer, Defence Equipment & Support

The common challenge that faces organisations making major investment decisions on first time and/or novel & innovative projects, is how can one achieve cost confidence before it is too late! It was commonly said that MOD usually delivered what it paid for, it was just hopeless at estimating a priori how much it would end up costing to deliver. The result was accusations of ballooning costs, incompetent management, exploitative contractors etc. Very few of these explanations were substantiated by evidence. The seldom-made accusation that the budget was set at a completely unrealistic level initially was almost always the real issue. This experience is not unique to defence. Even the much-praised Olympics were either under budget or grossly over budget depending on the number one uses as the original benchmark. And in marine renewable energy we are encountering great difficulty in determining project estimates with confidence for projects that have never been attempted before with new technology largely untried and untested. This presentation will explore the approaches that can be applied in practice to get it right first time.

12.00 Society Business and General Meeting, Arthur Griffiths, Chairman, SCAF

12.30 Buffet Lunch

13.40 “Cost Forecasting: where do we get it wrong?”, Dr Matt Bassford - Director, RAND Europe’s Defence and Security Programme

The presentation will examine a number of recent UK MOD Cat A procurement projects and analyse the key areas of cost growth in each. Using publically available data, we will show the impact of changing requirements and schedules on the cost of these projects as well as identify other areas for MOD and industry decision makers to be aware of when compiling their cost estimates.

14.20 “Forecasting the Future and Reflecting on the Past”, Mick Porter – Director, Independent Cost Evaluation and Estimating Capability, BAE Systems Military Air & Information

The role of the cost forecaster has evolved over the years and not necessarily for the better. By analogy with similar professions, this presentation will look at some of the issues facing cost forecasters in a changing and challenging environment and will provide an overview of how a ‘back to basics’ approach to up-skilling its cost estimators is being addressed within BAE Systems Military Air & Information.

15.00 Tea

15.20 “Forecasting NRE Cost and Delivering Projects within Budget: Why so difficult?”, Phil Wardle – Former Engineering Manager, BAE Systems and Visiting Lecturer Cranfield University

This presentation takes a look back at some of the recurring features of the way previous projects have been structured, and of the environments in which they have been conducted, in order to elicit some observations and challenges for cost forecasters and engineering managers of the future.

16.00 “Collaborating for Success”, Robert Shields and Nicky Painter – Senior Associates, Institute for Collaborative Working (a joint initiative between the Dept for Business Innovation and the Confederation of British Industry)

The presenters will discuss collaboration in complex projects, capitalization on the benefits and mitigation of risk. Nicky and Robert will also discuss the process for developing and managing collaboration and will show a framework for collaborative business relationships.

16.40 Discussion and Closing Remarks

Registration and Costs

Registration and coffee will be available from 09.00. The Conference will commence at 09.45am. The costs for the Conference is £150.00 per delegate. A 10% discount is available for group booking of more than 4 delegates and a 15% discount is available for group bookings of more than 10 delegates. These costs include all refreshments, a buffet lunch and FREE attendance to all future SCAF organised events until August 2013.

To register, please contact Neil Morrill by email: ndmorrill@dstl.gov.uk or call 023 9253 7271

Uncertainty in Competitive Bidding – Using the cost forecast for pricing decisions

Drs Melanie Kreye, Linda Newnes and Yee Mey Goh discuss implications from research to industry

The suppliers of long-life products such as submarines and airplanes no longer simply sell these products but provide their capability or availability. This means that companies that traditionally design and manufacture long-life products now compete through the provision of a service. These companies face a high level of uncertainty due to the novelty of the process of designing and managing the contract and the long-term nature of services. As a consequence, this offers companies the challenge of determining an appropriate price bid for the service, in particular a price which will enable them to win the contract as well as make a profit.

The research reported in this article aims at supporting these companies in their pricing decision process. The outcome of the research is the provision of a tool that models the uncertainties at the competitive bidding stage and depicts their influence on the probability of winning the contract and the probability of making a profit. This research is based on collaboration with SCAF, in particular the members' contribution to the experimental work that was used to develop the tool.

Experimental work

Two experimental studies were undertaken to infer the decision making process due to the uncertainty in cost estimate. The first study – undertaken at the SCAF event in March 2009 - investigated the influence of different ways of displaying the cost forecast and the uncertainty connected to it. Three approaches to displaying costing information were tested, namely a three-point estimate, a bar chart and a fan-diagram. The results showed that the fan-diagram triggered decision makers to be most aware of the uncertainty connected to the forecast and the influences of these uncertainties on their decisions.

The second study – undertaken in March 2010 – investigated the influence of competition on the decision-making process. The cost forecast was displayed as a fan-diagram based on the results of the first study. It was concluded that the existence of competition in a bidding scenario caused the decision maker to change his/her interpretation of the cost estimate and the pricing decision based upon this estimate, where, 67.9% of the participants changed their decision. This change occurred in a consistent way. In other words, most decision makers consistently lowered their price bids, to stay competitive in the new situation, or raised the price bid, to balance out the increased level of risk and uncertainty.

Following these two studies, interviews with pricing decision makers in various industrial sectors including aerospace, defence, engineering, IT and construction were carried out. This aimed at identifying the information that is typically available at the competitive bidding stage and is used to form a bidding strategy. The results suggest that many companies have a reasonable level of knowledge about their competitors and their customer. This information can be used for the modelling process to support the decision at the competitive bidding stage.

Conceptual framework of uncertainties influencing the bidding strategy

Based on the experimental work, a framework was developed which depicts the uncertainty factors that can influence the pricing decision at the competitive bidding stage. Figure 1 depicts this framework and the four influencing factors, namely service contract conditions, internal company perspective, competitors and customer.

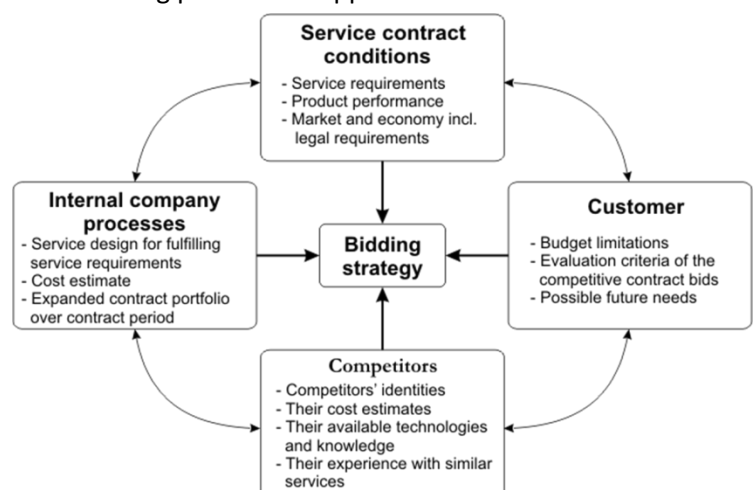


Figure 1: Uncertainty Framework for Pricing Decisions

The **service contract conditions** describe the contract and service requirements with e.g. payment details and the economic situation of the bidding company. The **internal company processes** describes the issues of the service 2 design, the associated cost estimate and the general contract situation of the bidding company. The issues connected to the **competitors** are bidding company knowledge about their identity, their estimated costs for fulfilling the service requirements, their possible competitive advantage through specific technology, manufacturing or knowledge and their experience in the field.

The **customer** may be uncertain regarding their budget limit, evaluation criteria of the submitted bids and as a possible future contractor.

This framework can be used to identify the factors that are most important to a specific competitive bidding situation and to model these uncertainties.

Modelling the uncertainties

In a final step, the framework was used to model the uncertainties and include them in a decision matrix to depict the probability of winning the contract and the probability of making a profit.

The model is based on a subjective assessment of the situation by the bidding decision maker. This means that it accounts for information that is held in e.g. a database and the experience and knowledge of the decision maker(s). To model the probability of winning the contract, the uncertainty connected to the customer and competitors were used. The probability of winning the contract can be interpreted as the probability of conforming to requirements – both in comparison to the aims of the customer with the service contract and in comparison to the competitors’ bids. The probability of making a profit can be interpreted as the probability that the actual costs are lower than the price bid. Thus, the uncertainty connected to the cost estimate was used as a basis to model the probability of making a profit. This is shown in Table 1.

Price bids [€M]	40	41	42	43	44	45	46	47	48
P _{winning}	86-100%	84-98%	82-96%	54-68%	21-37%	16-26%	12-15%	8-11%	4%
P _{profit}	0%	15-85%	85-100%	85-100%	85-100%	85-100%	85-100%	85-100%	85-100%

Table 1: Decision matrix showing the probability of winning the contract and the probability of making a profit

Based on this decision matrix, the decision maker can balance the trade-offs between two probability functions. For example, the difference of the probability of winning between a price bid of £40M and £42M is relatively small, however, the probability of making a profit changed from 0% to 85-100%. This supports the decision-making process at the competitive bidding stage as it includes the uncertainties in the process.

Conclusions

The research described in this article introduces an approach that offers a support for industrial decision makers in their pricing activities for service contracts of long-term products. Currently, the authors continue the work on this project to increase the usability of the approach for industry. The aim is to develop a workbook containing clear instructions on the collection of the necessary information and the further steps involved in implementing the approach. This will be supported by a series of workshops to establish the usability of the research.

The authors

Dr Melanie Kreye has undertaken her PhD at the University of Bath under the supervision of Dr Linda Newnes (Head of Costing Research at the University of Bath) and Dr Yee Mey Goh (Loughborough University). The focus of the PhD was the research described in this article.

Acknowledgements

The authors would like to thank Arthur Griffiths and Max Murray-Brooks for the opportunity to undertake the studies during the SCAF workshops. Further acknowledgement goes to the participants of the experimental studies for their time and efforts. Industrial input and knowledge into research activities is critical to obtain realistic results and develop novel approaches that are relevant to industry.

SCAF Workshop
Tuesday 27th November 2012
The BAWA Centre
Filton, Bristol

CALL FOR PAPERS

Theme: Learning from Experience-interactive and practical

Insufficient attention to cost forecasting can result in wasted money and time while compromising the quality of project information. Paramount to this is the ability of the estimators to keep pace with project changes and current use of novel technology and constraints in an ever moving decision making process.

Papers are invited to support a survey to identify potential cost forecasting shortfalls against industry standards in:

- **Developments in Software estimating**
 - **Hardware estimating**
 - **Integrated quantitative schedule and cost risk analysis**
 - **Life cycle costing**
 - **Strategic views on cost forecasting**
 - **Change management and control**
 - **Data gathering and normalisation**
 - **Statistical techniques for estimating**
 - **Cost analysis techniques**
-

Deadline

Please let us know if you plan on submitting a paper and what your planned topic will be no later than 24th September 2012. Forward details to:

Neil Morrill at ndmorrill@dstl.gov.uk or call 02392-53-7271.

“Cost Model Development: The 2012 SCAF Cost Estimating Challenge”

SCAF Workshop, 24th April 2012, BAWA
Centre, Bristol

The purpose of the workshop was to provide a training session in cost estimating conducted by professional estimating teams from academia, industry, tool vendors and consulting with the added benefit of top-level critique by senior government and industry executives.

The challenge was to assume that you were the chief cost estimator at an automobile company and had been gathering technical and price information on cars for a number of years. You were then approached with a request to produce price information more quickly”

Data had been provided by SCAF and the objective was to show the ability to equip forecourt staff with a quick pricing tool for tailored vehicles to meet the company’s strategic goals.

Six teams participated (Team CAAS had to withdraw at the last minute due to work commitments). The presentation order was drawn out of a hat and the 100+ attendees enjoyed the intensity and participation with each team as they discussed their individual approaches and results.

Mohammad Ali Sarakandi and **Dr Paul Baguley** represented **Team Cranfield** and provided an academic viewpoint on the interpretation and use of data. They emphasised the importance of understanding the data and demonstrated the design of experiments to test and trial linear and non-linear equations prior to use in the model.

Oliver Markwardt and **Dave Hedley** represented **Team BMT** and gave a very different perspective through the comparison of alternative data analysis

tools (MS Excel vs Minitab). They also demonstrated the development of regression equations and gave a live demonstration of the predictive cost model.

Miss Emma Woodham, and **Mr Richard Cousins** represented **Team Atkins** and showed how the use continuous and discontinuous data had a significant role in the development of the parametric equations. They also discussed the limitations of the predictive results, the validation process and gave examples of the results.

Robin Williams and **Dr Mark Gilmour** from **Team QinetiQ** discussed their approach to data gathering, the basis of their hypothesis and showed very clear graphical charts to explain their results. The presentation concluded with a case study and a statement on lessons learned.

Adam Rechert and **Sanjay Sadier** represented **Team AWE** brought some additional reporting parameters to the table by discussing operating and support costs in addition to purchase price considerations.

Nandeep Jhans, **Owen Brown** and **Mark Burdett** formed the **Thales Bid Finance Team** and provided the most comprehensive presentation of the day. Following a discussion on data structure and analysis they showed how to identify gaps, remove errors, normalise and adjustment to suit customer expectations. This was followed with a demonstration of their dynamic pricing tool that clearly identified base prices, overheads and profit margins.

The review panel members included:

Dr Spencer Woodford, Director, Burchelli Consulting

Mark Wright, Head of Cost Forecasting, MoD

Alan Jones, Manager, Estimating Capability Development BAE Systems

David Davison, Principal Technical Scrutineer, MoD

Dave Tilley, BCE Future Projects Manager, MBDA

Our thanks to all the speakers and their companies for making this a very worthwhile workshop.

“Estimating for Partnering and Service Provision”

SCAF Workshop, 12th June
2012, Ashton & Lea Golf Club, Preston

Traditionally the final workshop of the SCAF year was held at the Ashton & Lea Golf Club in Preston and was titled “**Estimating for Partnering and Service Provision**”. As was the case in 2011, we shared the venue on the day with the club’s ‘Seniors Tournament’ which was probably affected more than SCAF by the mixed weather. Karen Sparks was the Master of Ceremonies for the day, introducing the

presenters and improvising to gain time when the IT, inevitably, decided to misbehave at the most inappropriate moments.

The attendees were provided with a stimulating selection of presentations.

Mike Peters, *Head of Business and Solutions Modelling*, from **BAE Systems** presented on ‘**Evaluating Performance Based Service Contracts within a Partnered Environment**’ and considered the impact of performance based contracts and the transition from product to availability based supply and the use and benefits gained from the use of Business and Solution Modelling. Mike was stoic in the face of the inability of the IT to run a simulation prepared to demonstrate the results of the modelling. The gremlins were banished during the day and Mike was able to show the simulation of an aircraft maintenance facility during the afternoon session.

Dr Stuart Wicks, *Head of Business Analysis* at **Rolls-Royce Submarines** delivered an interesting discourse on the ‘**Levering the Balanced Scorecard**’. The balanced scorecard is a strategic performance management tool – a semi structured report supported by proven design methods and automated tools that can be used by managers to evaluate decision analysis processes. It is a technique that is widely adopted throughout the world. Stuart discussed its application and use in design optimisation within many stakeholder influences. Stuart illustrated his talk with some enlightening examples which highlighted the increased understanding of the critical or significant issues involved when developing the KPI’s to be employed to manage and monitor a client:supplier relationship.

Dr Melanie Kreye, from the **University of Bath**, presented on the findings of a research study associated with the use of an uncertainty framework, illustrated by 2 case studies for assessing the ‘**Uncertainty in Competitive Bidding for Service Contracts**’. The presentation was based on the results of research, including questionnaire data collected at a previous SCAF event, and introduced an approach that offers a support for industrial decision makers in their pricing activities for service contracts of long-term products. The aim of the study is to develop a workbook containing clear instructions on the collection of the necessary information and the further steps involved in implementing the approach. The 2 case studies were reassuringly mathematical and considered the probabilities of winning a competitive bid and the probability of making a profit from a contract; topics close to the hearts of many attending the workshop.

Richard Dobie of **BAE Systems** and **David Kirby** from **Persides Consulting Services** teamed to deliver a presentation on a modelling framework to predict and assess the satisfaction of contract KPIs for an arrangement to support a fleet of several dozen Terrier vehicles deployed by the UK MOD in up to 4 theatres. BAES requires insight regarding the confidence of achieving a variety of supply chain related KPIs and the associated costs. The tool presented may be used to quantify confidence ranges for KPIs and costs, and identify changes to improve performance. The use of MS Excel spreadsheets to capture input data for use by a Witness model which outputs data into an MS Access database was described.

The final presentation was a joint venture from **Simon Brown** from **SEA**, and **Chris Warfield** and **Andy Mills** from **Arke** who presented on 'MOSAIC - ELS Task Acq 01 Cost of Open Systems Architectures'. The presenters briefly described the use of the Expeditionary Logistics and Support (ELS) Research Programme Framework and the continuing studies into the use of Open System Architectures (OSA) in the development and prompt delivery of flexible and cost-effective capability. The need and requirements of a cost model for OSA were described and the challenges associated with providing all stakeholders with the necessary information and a proposed cost model were presented.

The workshop concluded with a brief discussion and survey of topics the audience would welcome at future SCAF events. Subjects included: 'Simulation in the support environment'; optimisation and the use of optimisation tools; data collection and analysis and 'complexity'.



"Summer Workshop and Reception"

Tuesday 3rd July 2012

At-Bristol Science and Discovery Centre, Bristol



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Society for Cost Analysis and Forecasting

This year's summer reception was held in Bristol at the 'AT-BRISTOL' science centre (<http://www.at-bristol.org.uk>). In addition to a family friendly suite of interactive educational exhibits and a planetarium, the centre boasts a high tech environmentally friendly energy management system.

The At-Bristol building is Grade II listed and was originally a railway goods shed, built by Great Western Railway in 1903. It is one of the earliest reinforced concrete buildings in the UK.

The At-Bristol building is an innovative and cutting-edge building system, including:

- The only working example of a phase change storage tank in the country.
- All heating and cooling comes from renewable air source heat pumps, running at night.
- The air from heat pumps is then released by the phase change tank during the day.
- CO₂ controlled variable ventilation with heat recovery thermal wheels.
- Low energy lighting throughout, voltage optimisation, exhibit and lighting controls.
- Insulated above 1998 standards.
- Advanced energy monitoring system with 138 sensors recording exactly where and when our electricity is used. Our 'energy reduction group' has used this to so far reduce consumption by 10% in the last year.

The SCAF members and partners who attended the centre on 3rd July were given an extremely informative 'behind the scenes' guided tour of the centre's energy management machinery and control facilities. These include the use of a phase-change tank in the main exhibition hall to store or absorb energy as appropriate to heat or cool the centre. We were also shown the air source heat pumps, heat exchanger plant and 50kW photovoltaic array located on the roof and protected from undesirable pigeon and seagull deposits by Brian, a robotic peregrine falcon. Several attendees visited the planetarium – the large mirrored sphere outside the main building - to learn about the universe.

As well as an excellent meal we were also able to participate in a survey being undertaken by students from the University of Bath.

Future Events

SCAF Workshops and Seminars for 2012/13

- 18 Sep 2012** “Annual Conference”, BAWA Centre, Bristol. The theme this year is “Forecasting for Success”. Our conference speakers have a wealth of experience with the challenges facing major projects and will provide a knowledgeable body of expertise and learning experience to the attendees.
- 27 Nov 2012** “Learning from Experience: Interactive and Practical”, BAWA Centre, Bristol. An opportunity to participate and debate on current costing issues. *Please see Call for Papers on page 6.*
- 05 Feb 2013** “Economics and Estimating”, Royal Institution of Naval Architects, London. *Papers invited.*
- 23 Apr 2013** “The 2013 SCAF Estimating Challenge”, BAWA Centre, Bristol. Our annual challenge provides the presenting teams to participate and discuss the results of a case study to a receptive audience. *Teams now invited to participate*
- 04 Jun 2013** “Quantitative Cost and Risk Analysis”, Ashton & Lea Golf Club, Preston, Lancashire. *Papers invited.*
- 02 Jul 2013** “Summer Reception” – *Venue to be confirmed*
- 17 Sep 2013** “Annual Conference”, BAWA Centre, Bristol
- Nov 2013** “Vendor Day”, BAWA Centre, Bristol

Other Related Events

- 03-04 Oct 2012** 24th workshop of the European Aerospace Cost Engineering Group, University of Bath. Further details: email: EACE@hotmail.co.uk
- 08 Nov 2012** ACostE Conference “Cost Matters”, Holiday Inn, London Road, Coventry. Further details: www.acoste.org/conference
- 18-21 Jun 2013** ISPA/SCEA Joint Annual Conference & Training Workshop, Sheraton New Orleans, New Orleans, LA. Further details www.ispa-cost.org

Networking
for the Cost
Estimating
and Analysis
Community

SCAF is not responsible for the content of any external websites published in this Newsletter



Society for Cost Analysis and Forecasting

www.scaf.org.uk



Bridging relationships in cost estimating

For over 20 years the Society has sought to illuminate key issues in the analysis and forecasting of project costs—and to promote best practice within the cost forecasting community.

The Society provides a single point of contact for advice to those wishing to address key issues in the analysis and forecasting of costs and timescales of complex programmes.

Workshops and seminars are held at regular intervals throughout the year. A newsletter is published electronically 3 times a year.

Collaborative links with other societies has always been maintained and a library of relevant papers are available. A single annual payment at the Annual Conference entitles members to attend all the years' programme of SCAF events at no further cost. The Summer Reception is also provided free to SCAF members and their guests.

SCAF is committed to providing Continuing Professional Development (CPD) through the provision of its skills workshops and its support to Professional Development courses.

The Society therefore continues to provide members with exceptional value for money.

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Join us at our new LinkedIn Group

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