

Technology Management

Quarterly newsletter of the Centre for Technology Management

May 2000



UNIVERSITY OF
CAMBRIDGE

Communicating new ideas in technology management

The Centre is running an increasing number of events for industrialists, aimed at exchanging and disseminating leading practice in technology management. These make available results from research projects and also facilitate discussion and networking between different companies and sectors.

'Future technology – future markets' is the title of our Symposium on July 13-14, now in its sixth year (brochure enclosed). In collaboration with the Foresight Programme at the Office of Science and Technology, and the MATI Consortium from the USA, we have a full programme of keynote speakers, case studies and workshops.

Researcher takes top Hollywood award for lens design

CTM researcher James Moultrie has won a prestigious Scientific and Engineering Award from the Academy of Motion Pictures, Arts and Sciences. James recently joined the Centre as an Industrial Research Fellow, working on a project investigating 'good design practice', in partnership with the Royal College of Art.

The Academy is best known for the annual Oscars ceremony which rewards the creative aspects of movie making. However, since the 1930s it has also presented awards which recognise the contribution of innovative engineering and scientific achievement to movie making.

James won the award for the mechanical design of the Cooke S4 range of fixed focal length lenses for professional 35mm motion picture photography; a project which he also managed from 1994 to its completion



James (right) with the lenses' optical designers after receiving their awards

in 1997. These seven high speed lenses (T2, f/1.8) range from a wide angle 14mm lens, to a narrow angle 100mm lens. A full set would cost upwards of £40,000. All lenses have unequalled optical performance and a fully modular mechanical design to enable ease of use, service and maintainability. The patented focus mechanism utilises a unique, backlash free cam system which enables clear, evenly spaced focus scales to satisfy the demands of the cinematographer.

Following their launch at the end of 1997, the lenses have received high praise from movie makers and have been used on films such as *10 things I hate about you*, *The Beach* and *Angela's Ashes*.

It promises to be our most popular event to date, so don't forget to register early and secure the free place reserved for each full Centre member company.

Our series of three evening workshops ran through January, February and March. Under the theme *The challenge of technology change*, they tackled the issues of technological innovation, disruptive technology and implementing technology change via new products.

These evening workshops provide a great opportunity for informal exploration of new (and old!) ideas and, although we realise they are most convenient for companies close to Cambridge, all Centre members are very welcome and are entitled to two free places.

A new way of disseminating the Centre's work is through one or two day executive courses. These present the results of completed research and deal with such areas as make or buy issues and managing new product introduction. Centre members are entitled to a discount on fees. All the events offered by the Centre for the next three months are shown on the back page.

David Probert

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Engineering re-use – or making the most of what you’ve got!

The engineering re-use project is drawing to a successful conclusion. This two-year project in collaboration with BAE SYSTEMS Avionics has taken a systematic look at the re-use of assets in an engineering context in order to provide useful, industrially-focussed guidance. It provides advice on how to take advantage of the potential benefits of re-use, such as reduced time, cost, resource and risk, whilst minimising dangers such as unforeseen cost implications, the erosion of core competences and employee dissatisfaction.

Guidelines

The central deliverable of the project is a set of guidelines containing tools which will help companies to:

- identify re-usable assets within the business
- analyse re-usable assets
- decide whether or not to re-use an asset
- enable systematic re-use within the business

Identifying assets

The structure of the guidelines is shown in the diagram. Assets are identified by relating the business to a standard model and brainstorming different classes of assets which the company may possess. These can then be analysed to reveal any related assets and ascertain the types of knowledge needed for their re-use. In addition, some of the implications of re-using them can be reviewed.

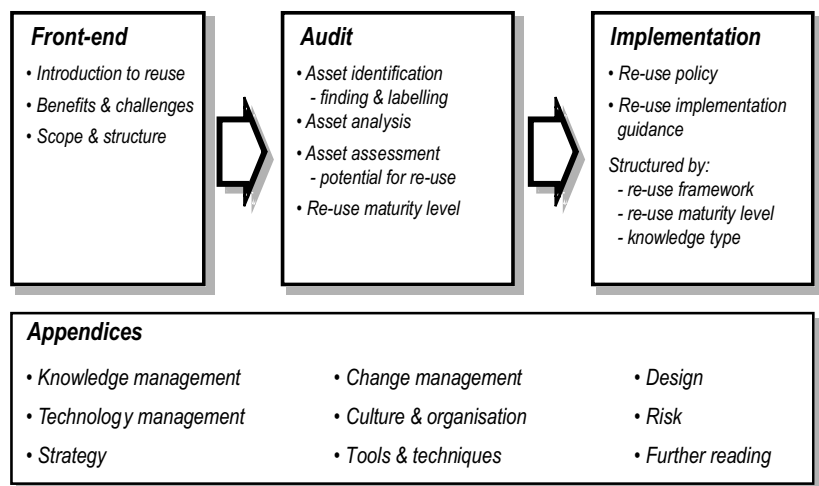
The decision whether to re-use or not is supported by a set of questions to ensure that all the relevant implications have been considered. These questions are generic and rely on the expertise of the user to quantify the costs and benefits identified. They provide a framework to ensure important issues are not overlooked. The issues involved are further developed through case studies included in the guidelines.

Maturity model

The enabling of systematic re-use within an organisation is supported by a maturity model that helps businesses assess themselves to locate weak areas. The guidelines are designed to be succinct and easy to pick up and apply. This is backed up by appendices on important topics providing more in-depth information and pointers to further reading.

Underpinning the guidelines is a framework for re-use derived from an extensive review of the literature as well as

The Re-use Guidelines



interview and case study work. The software engineering literature, in particular, is a rich source of lessons to be learnt, and although care is needed in extending this knowledge to engineering in general, much is applicable. Ideas such as ‘domain modelling’ prior to design for re-use appear to have universal relevance, as do heuristics on when to design for re-use and general issues of change management in organisations.

Modular approach

An industrial workshop was held in March to present the project's work so far including some elements of the guidelines. An interesting presentation by Vernon Hockley of Unilever described how the company had successfully implemented a modular approach for the design of their process plants, and described the benefits they had achieved. The ensuing discussion highlighted differences between this and issues in the avionics industry, and provided useful clarification on what terminology would be easily understood in industry, what features were not sufficiently emphasised, and which parts of the guidelines were unclear. The work was aired again in April at the Technology Management Network forum on tools.

If you would like to hear more about this work, please contact Francis Hunt at the Centre.

TMAP guide published

CTM's comprehensive guide to the Technology Management Assessment Procedure (TMAP), aimed at companies wishing to improve their technology management activities, is about to be published by the Institution of Electrical Engineers.

Comprising three books and a floppy disc, the package is attractively presented in a special case. It is suitable for companies of all sizes and is designed to reveal the strengths and weaknesses of current activities so that improvements can be soundly based.

The three books included are:

- an awareness guide introducing the key concepts of technology management as well as tools to help managers in practice
- a process guide which describes the TM process framework, the main TMAP process itself and a case study of the application of the process
- a facilitation guide including how to facilitate the TMAP procedure, apply the tools, run workshops and other activities

The computer disc contains files of overheads to be used in workshops and presentations plus the questionnaires used during the TMAP procedure. The complete package is being sold for about £90. Enquiries to IEE's Marketing Officer:

E-mail: sales@iee.org.uk

Marconi to fund Cambridge research centre

The University of Cambridge and Marconi plc recently announced the establishment of a £40 million, world-class communications research centre, to develop new technology for the Internet and data transmission.

The new initiative will draw on existing Cambridge research activities at the Centre for Communications Systems Research, the Computer Laboratory and the Centre for Mathematical Sciences. It will be known as the Marconi Communications Centre and will be located on the University's West Cambridge site.

Links with CTM

The Institute for Manufacturing and, in particular, the Centre for Technology Management, already enjoys excellent working links with Marconi. We are looking forward to the new opportunities that this major investment in the University will open up.

Cambridge welcomes visitors from the MIT Management of Technology Programme

The MIT Management of Technology Programme is a one year Masters course for experienced professionals, usually sponsored by their company. Professor Jim Utterback is the academic course director and on March 17 we were pleased to welcome a group of 55 people for a day in Cambridge as part of a three-week European study tour. Their particular interest was technological innovation, entrepreneurship and developments in e-business. The day included an update on the new Cambridge MIT Institute, an introduction to the Judge Institute of Management Studies and visits to the AT&T laboratories and the St John's Innovation Centre.

CTM's activities were a main feature of the programme, with presentations about the role of the Centre and our research projects. We invited speakers from two of our collaborating companies (Rick Mitchell from Domino and Danny Chapchal from Cambridge Display Technologies) to present their company perspectives, which prompted much interest and discussion.

The day finished with a reception at the Møller Centre hosted by Professor Mike Gregory, at which Dr Hermann Hauser described the development of innovative technology-based industry in the Cambridge area. It was a stimulating and enjoyable day for all concerned and we hope to welcome the group again next year.

David Probert

Coming events

Speeding new products to market

We shall be repeating this successful 2-day course on new product introduction on 29-30 June at the Møller Centre, Cambridge. The course covers the management of the new product introduction process, and builds on a combination of research conducted at CTM and elsewhere, and on practical experience.

Make-or-buy: from strategy to practice

This popular one-day course will take place on 26 September. Aimed at people facing make-or-buy issues, it draws on past and current research to present best practice in this area.

Participants will get hands-on experience of using the practical analytical and decision support tools we have developed in collaboration with our colleagues in the Centre for Strategy and Performance. Early booking is advised as numbers are limited.

Booking details: contact Jackie Ouchikh - email: jo2@eng.cam.ac.uk. (Centre members qualify for a reduced rate for these events).

Technology management research at Cambridge

- New product introduction for SMEs
- New Product Introduction collaboration
- Strategic technology management
- R&D project selection
- World class software delivery
- Product planning
- Technology change
- Technology management: a process approach
- Decision support
- Technology evolution in hi-tech firms
- Innovation management in hi-tech firms
- Technology management in software production
- Strategic management competences
- Strategic make or buy
- Industrial make or buy decisions
- Sustainability and knowledge management
- Engineering re-use
- Technology foresight

Conference reports

Expanding Boundaries of POM

11th annual meeting of the Production and Operations Management Society, San Antonio, April 2000

About 200 papers were presented at this conference from around the world. Several topics relevant to technology management were covered including knowledge management and learning; skills and human resource management; design and management of organisations and production systems; strategy, change and planning; performance measurement; supply chain management.

A presentation of particular interest was made by Steven Spear from Harvard, concerning the organisational structures and work patterns that support Toyota's production systems. Short papers from POMS 2000 will be made available on the internet in due course (www.poms.org).

Rob Phaal

Technology management - tools, techniques and education EPSRC Technology Management Network

Manchester, 6 April 2000

This event was organised by Jeff Butler of PREST. It provided a valuable opportunity to learn about a wide range of tools and techniques linked to technology management practice.

The tools have been developed through academic research, consultancy assignments and business development opportunities, or via European collaborative projects. Some are tried and tested; others are just emerging. They are applicable to all sizes of business and can be considered by a wide range of managers, in finance, human resources, purchasing and quality management as well as technology managers.

CTM is happy to provide further information about the different tools.

Clare Farrukh

The key to prosperity in the 3rd millennium

9th International Association for the Management of Technology (IAMOT) Conference

21-25 February 2000

A key theme of this conference was Industry/University collaboration. Good key notes were given by Dr Rafik Loutfy, Senior VP & Corporate Chief Technical Officer, Xerox Corporation and Dr William Costerton, Director and Professor, Centre for Biofilm Engineering, Montana State University.

Clare Farrukh



One of the discussion groups at CTM's evening workshop held in Cambridge in March. See page 3 for a report on the series.

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Quarterly Diary

June

12th	5 - 7.30pm	Evening Workshop Cambridge	<i>Managing and measuring complexity</i>
29th-30th		2-day course Cambridge	<i>Speeding new products to market</i>

July

5th	5 - 7.30pm	Evening Workshop Cambridge	<i>Competence and capability - measurement and development</i>
13th-14th		Technology Management Symposium, Cambridge	<i>Future technology: future planning</i>