Technology Management

Quarterly newsletter of the Centre for Technology Management

February 2002

UNIVERSITY OF CAMBRIDGE

Institute's innovative research recognised by £2.95 million award

The Institute for Manufacturing has been officially declared an 'Innovative Manufacturing Research Centre' (IMRC) by the Engineering and Physical Sciences Research Council and awarded a 'block grant' of just under £3 million to support its research activities.

IfM is one of only a handful of university research centres in the UK to be declared an IMRC, all of which took part in a special launch event in London in November. The work of the Centre for Technology Management will play a key part in the IMRC research, which will be clustered around three themes:

- Structuring and managing international supply networks
- Rapid technology acquisition and deployment
- Manufacturing knowledge and communication

The launch meeting was addressed by the Minister for Science, Lord Sainsbury, and representatives from supporting companies and participating universities, including Professor Mike Gregory from IfM.

Secure funding

A key aim of the IMRC initiative is to foster bigger and more ambitious research projects, by concentrating research resources on a selected number of centres that will benefit from a more secure funding regime. This will allow the UK's best researchers to devote more of their time and resource to research which aims to improve the competitive position of UK manufacturing. A major element of the activities of the Centres will be the dissemination of results and technology transfer.

A new CTM project on sourcing embedded software is one of the first to be carried out in the context of the IMRC. See back page for further details.

Encouraging better product design

The Good Design Practice project, funded by the Monument Trust, completed its first phase in December.

The project, a collaboration between Cambridge University and the Royal College of Art, aims to help companies to design better products and to improve their product design capability.

A specific objective has been to encourage the integration of technical, market and user-focused perspectives to develop products which are attractive, usable and easily manufactured.

A draft workbook has been produced which includes a tool to audit the effectiveness of the design process and also a booklet which captures the principles and practice of 'good design'.

Training course

Funding has been secured for the second phase, which will see the completion and evaluation of both the booklet and the workbook, as well as the development of an industrial training course. If you would like to be involved in this project please email

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Contents

The paradox of open source software

Take some software engineers. Separate them physically and make them communicate only by e-mail. Give them no firm specification or deadlines. And don't pay them. This may not sound like software 'best practice', but it is, in fact, the 'process' that produced the kernel of the GNU/Linux operating system.

Last year IBM claimed to have invested $1 billion in Linux related activity and Amazon.com switched to using it on their servers. A recent survey of 500 embedded system developers by Evans Data, a software development market research firm, revealed that 45 per cent intend to release a Linux-based embedded product in 2002. This calls for an explanation!

Marconi are funding a CTM project to clarify some of the issues and answer important questions. Are there success factors underpinning online development communities, and if so, what are they? What are the costs and benefits of so-called open source software?

First, what exactly is open source software? Open source software development occurs when a group of independent volunteers collaborate over the internet to develop software, sharing the source code - the 'text' from which the program is generated.

Software itself has peculiar properties that allow open source to be viable in the first place: software can be copied for virtually nothing and distributed rapidly over the internet. This means that if you create a 'cool' software add-on for your word processor, you can share it instantaneously, and for little cost, with your friends. This would be impossible if you had created an add-on for your car. Hence, the potential economies of scale are enormous. If you and a set of nine friends each contribute a tenth of the software, you obtain the whole product for a tenth of the effort (plus any overheads in coordinating the development and integrating the contributions.)

According to Bruce Perens, the open source strategist at Hewlett-Packard, the main advantages to HP of using open source software are:

- control - HP can access the source code themselves and choose which third parties to involve
- time to market - they can often build upon something that already exists

The main disadvantage is that under the terms of the GNU Public Licence, the most popular open source software licence, HP have had to expose intellectual property that they would otherwise have kept hidden.

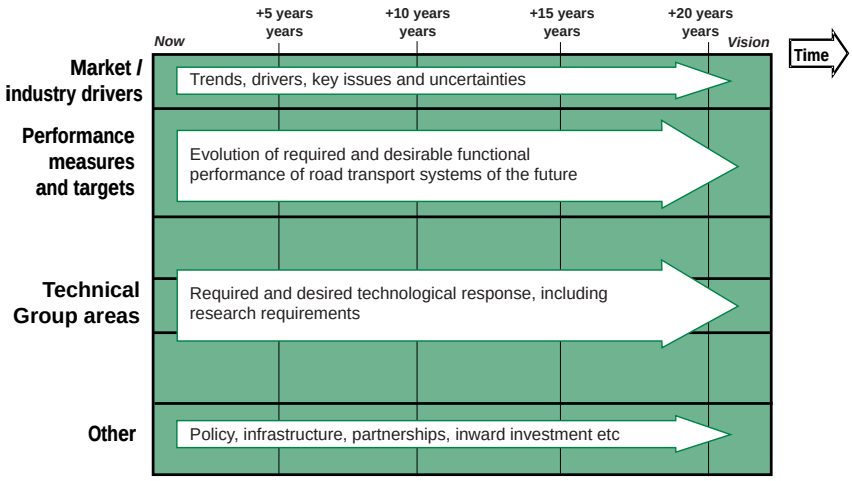
For more information on the open source software project, please email Francis Hunt at: fhh10@cam.ac.uk

Mapping the future of automotive research

CTM researchers are using the technique of technology roadmapping to help decide what UK research is needed in relation to road transport over the next 20 years.

The project started last November and was commissioned by the Department of Trade and Industry's Foresight Vehicle programme. The market and system performance layers of the roadmap will be finished by the end of February, with the final report due to be completed in August.

The work is presenting a challenge to the Centre team, owing to the broad scope and complexity of the topic. However, it is anticipated that the project will lead to further applications to other UK and European foresight initiatives. For further information contact Rob Phaal: rp108@eng.cam.ac.uk



Sharing the trials and tribulations of new product development

Centre members are entitled to two free places at a forum in which companies share experiences of new product introduction.

The NPI (New Product Introduction) Club was started by University researchers in 1993 and provides the opportunity for companies in the Cambridge area to share good practice and perform some informal benchmarking.

Meetings are held every six weeks in Cambridge, from 5.00 to 7.30 pm, followed by a buffet. A typical event begins with an informal presentation from a member company or invited speaker, followed by discussion.

Industrial design

The Autumn 2001 season finished with a well-attended meeting on 'Managing industrial design'. Other topics in this series included:

- NPI process improvement
- Understanding market and user needs
- Improving the product design process
- Effective NPI collaborations

Brief summaries of these meetings can be found on the CTM website homepage by following the NPI Club link.

Programme for 2002

The provisional programme for the coming year is given below.

13 March: Quality management & NPI (ISO 9000:2000, TickIt, CMM)

24 April: Benchmarking and metrics

12 June: Prototyping

17 July: Encouraging creativity

28 August: Risk management

9 October: Project selection

20 November: Design for low volume production

If you would like to know more about the NPI club, please email Pete Fraser: pvf20@eng.cam.ac.uk

Technology roadmapping

Industrial interest in technology roadmapping continues to grow. The Centre has developed particular expertise in this area and receives enquiries about it from around the world.

A guide to 'fast-start' technology roadmapping (right), written by Centre researchers, has recently been published by the Institute. Other roadmapping-related activities include:

- running the first training workshop in Cambridge on 23 January (see report back page)
- holding two successful meetings of the TRM User Group with another planned for 20 March
- taking part in a two-day roadmapping seminar in California last November organised by The Learning Trust
- organising a one-day roadmapping workshop with the GKN Technology Forum in January
- arranging applications of the process at Purdue University
- applying technology roadmapping to the DTI Foresight Vehicle programme (see opposite)

For further information contact Rob Phaal: rp108@eng.cam.ac.ulk

Hi-tech research - Anglo-French collaboration

Collaborative research into high-tech enterprises is underway between CERAM, the Graduate School of Management and Technology at Sophia Antipolis, France, the Cambridge Entrepreneurship Centre and the high-tech research group HAPN, in the Centre for Technology Management. Converging interests were identified in the following areas:

- the growth of high-tech firms
- incubators
- clusters

Claire Rose leaves CTM

Claire Rose left the Institute and CTM at the end of November. She joined us in 1999 to work on the New Product Introduction collaborations project.

Technology management research at Cambridge

- Good design practice
- New product introduction collaboration
- Strategic technology management
- R&D project selection
- Software sourcing in manufacturing
- Product planning
- Technology change
- Technology management: a process approach
- Technology selection
- 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

Sourcing embedded software

The Centre has recently begun a major project on sourcing embedded software, funded by the EPSRC for a period of three years. Embedded software increases product functionality, and can be found increasingly in a variety of products from cars and washing machines to mobile phones and audio systems.

Researchers have interviewed a number of industrialists since the project launch meeting in November, giving an insight into the complex issues that affect embedded software development. They range from technical concerns such as architecture modularity and choice of operating systems, to more generic business issues such as supplier relationships and project management.

To find out more about this project, please email Noordin Shehabuddeen: ntmhs2@eng.cam.ac.uk.

CTM Symposium 2002

The theme of this year's Cambridge Technology Management Symposium will be 'capturing the value' of technology. Issues covered will include the creation, exploitation, harnessing and protection of the value of technology.

Now in its eighth year the Symposium is aimed principally at senior technology managers from companies of all sizes. It will take place on 11 and 12 July at the Møller Centre, Churchill College, Cambridge.

Roadmapping workshop a success

A workshop on T-Plan, CTM's 'fast-start' product-technology roadmapping process, was attended by 23 delegates from Europe and the UK.

Key management tool

Roadmapping is a key technology management tool, enabling companies to link technological capability to product and business plans so that strategy and technology go hand-in-hand.

T-Plan is designed for companies who have not used technology roadmapping techniques before and is particularly suited to those with limited resources.

More events planned

Feedback from the event on 23 January was very positive and more workshops are planned.

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Diary

March		
7th	Product Development & Management Association	10.30 am - 3.30 pm Cambridge
13th	Quality management & NPI (ISO 9000:2000, TickIt, CMM)	NPI Club, 5.00 pm Cambridge
20th	Emerging business models for software development and sourcing	9.30 am - 4.00 pm TM Network Forum, Cambridge
April		
24th	Benchmarking & metrics	NPI Club, 5.00 pm Cambridge
May		
15th	Adding value to your product with embedded software	Evening Workshop Cambridge