IfM

UNIVERSITY OF CAMBRIDGE

Technology Management

Quarterly newsletter of the Centre for Technology Management (CTM)

August 2005

Companies open to new ideas…

The Centre for Technology Management is undertaking a growing number of collaborations with the world's foremost technology intensive businesses as they seek to improve their technology management capabilities.

Recent engagements have involved CTM people working in the UK, Europe, US and Japan as companies such as Toyota, Rolls-Royce and Microsoft tackle key technology management issues. These projects often take the form of special management education programmes, sometimes in collaboration with other universities. Recent projects with Toyota in Japan and with Rolls-Royce in Cambridge have proved particularly interesting examples of how these collaborations can work.

Our partner in Japan is Doshisha Business School in Kyoto which has a contract to provide management of technology education for Toyota, aimed particularly at engineers involved in product and process creation. Doshisha invited CTM to contribute special sessions on technology roadmapping, technology integration and the technology-product leap.

The openness of the Toyota people to explore new ideas and work on improving their technology management practice was remarkable – given their already world-leading position in the automotive sector. For James Moultrie and David Probert of CTM, the experience confirmed a belief that the most successful companies are always ready to look for new ways to address difficult issues.

Toyota engineers during a management education programme organised by CTM in collaboration with Doshisha Business School in Kyoto.

The group of 29 Toyota engineers covered all aspects of technology in the company's product range and engaged enthusiastically with the participative exercises – with the help of a team of excellent simultaneous translators. The engagement has inspired several further ideas for collaboration, including a future visit of mature students from Doshisha to Cambridge.

The Rolls-Royce programme was aimed at the manufacturing engineering community and was a continuation of a collaboration started with Cranfield University last year. This year's group included three manufacturing engineers from BOC Edwards. The week-long course, held at New Hall in Cambridge, covered all aspects of technology and innovation management.

The course was tailored to the particular company context and Rolls-Royce experts provided input on individual topics such as technology roadmapping, make-or-buy methods and the protection of intellectual property.

A very useful feature of such customised courses is the inclusion of a case study based on real data from another part of the company. This provides an excellent basis for internal company discussion and learning. Finally, the participants carry out an exercise back in their workplace, addressing a real problem with guidance from CTM staff.

CTM is always interested in such company collaborations as they provide a great opportunity for all parties to learn from each other. For further details of the possibilities please contact us on:
ctm-enquiries@eng.cam.ac.uk

Students display ideas for new products

For the first time this year, the undergraduate students on the IfM's manufacturing engineering course held a design show to exhibit the results of their work on product design. Throughout their third year the students work in teams of four or five to develop a new product with real business potential.

Having first identified a potential need, they research the market, develop original design concepts and create a full business plan addressing the market opportunities for products. The projects generate exciting new ideas and innovative technologies. Some teams go on to set up companies and develop their products for sale.

The design show was organised by James Moultrie of CTM, to give the students the opportunity to show off their work to a wider industrial community. It was open to an invited audience including local designers, entrepreneurs and venture capitalists.

Visitors to the student design show in June

Developing software overseas

On Thursday 14 July the CTM held a successful workshop on 'offshore' software development. This is the practice of having software developed abroad, typically in developing economies with reduced labour costs. Dave Barrett-Hague of Plasmon Data and Larry Marini of BOC Edwards reflected on their experiences in this area. Mr R.D. Kulkarni of Tata Elxsi provided insights into a supplier's perspective.

Francis Hunt of the CTM described some of the key issues in this area that have been identified in recent years by researchers. He also demonstrated the software sourcing checklist tool that has been developed at CTM as part of a research project on the more general issue of software sourcing decisions.

Comings and goings…

CTM welcomes **Christian Tausend** who will be working with Dr Tim Minshall between July and September comparing university spin-outs in Cambridge and Munich. Christian is a project manager and doctoral student at the ODEON Center for Entrepreneurship at the University of Munich (LMU). His doctoral thesis is in the field of private equity and venture capital.

At the same time we are saying goodbye to:

Andre Leme Fleury who has returned to Brazil after working within CTM on a project concerning software development strategies and processes.

Sebastien Ronteau who spent two months with CTM as part of his PhD studies with École Centrale Paris.

Graduates tackle a range of technology management issues

CTM hosted six research projects as part of the IfM's redesigned Advanced Course in Design Manufacture and Management (ACDMM) course. ACDMM is a nine-month course for graduates who divide their time between company-based projects, taught modules and individual research.

The 3-month research projects hosted by CTM enabled us to focus on exploratory research ideas, as well as to provide resource for existing projects. Topics were:

The relationship between the emotional response to product and brands: Investigating how consumer response to products might be influenced by brand perceptions.

Design trends: Investigating whether aesthetic design trends can be predicted and how these activities can be built into the design process.

Mapping the evolution of wireless LAN: Investigating the emergence of a 'new' industry.

Time to market in NPD: Aiming to establish the relative importance of time to market in technology intensive product development.

Investor perspectives on strategic alliances: A case-based study of how investors perceive strategic alliances with high tech firms.

Sectoral views of technology valuation: Determining what tools and techniques are used in technology valuation in the telecoms and pharmaceutical sectors.

New product introduction online

A new page has been added to the CTM website, bringing together information about our New Product Introduction activities and project outputs. You can find the page by following the links under Resources/Special Interest Groups, to New Product Introduction. The URL is:
http://www.ifm.eng.cam.ac.uk/ctm/npi

Finding the right solution for product support

Traditionally, companies have manufactured products and allowed the end users to determine how they should be maintained and upgraded, accepting many small contracts for repairs and upgrades.

There is now an increasing trend towards 'availability based' contracts that seek to reduce the cost of supporting products by transferring the responsibility for maintenance to the equipment manufacturer. This has a number of implications for the design of both the product and the organisation responsible for providing the maintenance and upgrade.

Partnership between IfM and BAE Systems

The Support Solutions Programme has been established to address these issues and to investigate the future of the key product-support business sector. The Programme is a partnership between the IfM and BAE Systems, one of Britain's largest engineering companies. The company sees Support Solutions as a major part of its future.

The Programme was launched in November 2004 when it was agreed to draw up a series of position papers by October 2005. These papers will include a review of the needs of the various sectors of BAE Systems – the company has interests in aircraft, shipping and land vehicles. The papers will review the status of support engineering in other industrial sectors and will describe how future Support Solutions might look.

The Project Manager for the new programme is Nik Thomas. Nik arrived at the IfM in March 2005, having previously worked in BAE Systems' corporate governance team, auditing programme management and engineering practices across the company.

Nik will liaise between the IfM and BAE Systems to ensure that the research team has access to the right people within the company and will also help to find the means to implement the research findings.

The IfM is currently recruiting a professor to lead the Programme and to integrate the various papers into a coherent research programme. The initiative involves researchers from a number of research centres within the IfM. CTM staff are involved in two of the key areas:

Technology insertion

Military equipment, especially ships and aircraft are complex pieces of equipment that may take 10 or 15 years from conception to entry into service. They will then remain in use for 30 or 40 years, sometimes more. This causes a number of problems around the installed technology, especially with increasingly complex electronics. Clive Kerr of CTM is working on a project to address such issues as the insertion of new technology into existing equipment, including both current upgrades of existing equipment and the future upgrade of systems currently in design.

Using the principles of modular design

Organisations set up to provide support solutions are medium-sized enterprises that may turn over several tens of millions of pounds per year, but both the engineering solution and the organisation have to be designed from scratch in a relatively short period of time. Francis Hunt is working with John Mills of the IfM's Centre for Strategy and Performance to see if the principles of modular design used in software engineering can be applied to these organisations.

What does the future hold for computational science?

CTM is leading a roadmapping process to help identify the future challenges and opportunities for computational science over the next decade and beyond. The initiative, *Towards 2020 Science*, is sponsored by Microsoft Research and involves a group of international experts who will identify the challenges, opportunities and the requirements for computing to accelerate science over the next decade and beyond.

The first draft of the roadmap was produced at a three-day workshop in Venice attended by 35 eminent scientists from around the world, covering disciplines as diverse as life sciences, physics, astronomy, earth sciences and chemistry, together with the underpinning computational and computer science. The first version of the roadmap is expected to be published later this year.

Contact Rob Phaal for further information (rp108@eng.cam.ac.uk) or see:
http://research.microsoft.com/ero/csp/2020Science/

Members of the new initiative get to grips with producing a vision for computational science at a workshop in Venice earlier this year.

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
- Enhancing creativity in new product development
- Technology management: a process approach
- Technology selection
- Technology evolution in hi-tech firms
- Innovation management in hi-tech firms
- Technology management in software production
- Technology scanning and intelligence
- Strategic make-or-buy
- Industrial make-or-buy decisions
- Sustainability and knowledge management
- Technology valuation
- Technology foresight

CTM Industrial Symposium: 28-29 September 2005, Downing College, Cambridge

This year, our annual two-day Symposium has the theme of *"Gaining better value from technology"*.

The Symposium will look at new forms of industrial collaboration that are emerging in relation to technological innovation. Increasingly, firms are joining together to each provide one part of a complete new business system. In this situation each participant will need to protect their position in the network and their opportunity to capture value. The Symposium will explore these issues, providing insights from the experience of leading firms and recent research. For further details, including how to book, see:

www.ifm.eng.cam.ac.uk/ctm/symposium

Delegates chatting during a coffee break at last year's CTM Industrial Symposium

Conference report

CTM members recently presented research papers at two conferences. The International Association for Management of Technology (IAMOT) Conference was held in May in Vienna, Austria. The CTM group presented the following papers:

- 'Technology Management and Broadband Competition Policy' (Ayuth Jirachaipravit)
- 'Alliances between technology start-ups and established firms' (Tim Minshall)
- 'Business appraisal of technology potentials: valuing technology' (Marcel Dissel)
- 'Enhancing creativity in new product development: what can be done?' (James Moultrie)

The European Institute for Advanced Studies in Management (EIASM) conference was held in June, in Copenhagen, Denmark. There were two papers presented by the CTM group:

- 'Enhancing creativity in new product development: Towards a framework for a sustainable growth process in team creativity' (Nicos Raftis)
- 'Determinants of value capture in modular innovation networks: the case of the digital projector' (Peter Fraser and David Probert)

Contact us

Centre for Technology Management
Institute for Manufacturing
Department of Engineering
Mill Lane
Cambridge CB2 1RX
UK

Tel: +44 (0)1223 766401
Fax: +44 (0)1223 766400
email: ctm-enquiries@eng.cam.ac.uk

www.ifm.eng.cam.ac.uk/ctm

Diary www.ifm.eng.cam.ac.uk/ctm/events

Sep		
28-29	*Gaining better value from technology*	11th annual CTM Symposium Cambridge
Oct		
18	*Enhancing creativity in new product development*	One-day workshop Cambridge
19	*Strategic roadmapping*	One-day course Cambridge
Nov		
2	*Make-or-buy*	One-day course Cambridge