

Technology Management

Quarterly newsletter of the Centre for Technology Management

November 2007

Conference explores successful innovation in an uncertain world

Great interest was generated by the theme of this year's Cambridge Technology Management Symposium. Over 80 people came to explore how opportunities for innovation can be recognised and exploited in today's uncertain business environment.

The mix of key speakers from world leading organisations, together with smaller case study and workshop sessions to promote interaction and discussion, led to a really useful exchange of experiences and a very positive response from delegates. A summary of the proceedings will go out shortly, but in the meantime here are some highlights.

The initial workshops are one of the most popular aspects of the Symposium as they give delegates a chance to get to know each other and work on a selected topic of personal interest. Delegates were keen to be able to attend more than one workshop in future – so we'll be considering how this could be managed.

Workshop themes mostly relate to current CTM research projects, and enable both researchers and

practitioners to learn from each other. Topics this year included:

- making open innovation work
- the use of visual techniques to represent complex systems
- breakthrough innovation in established firms
- evaluating technology investment decisions

The keynote speakers provided stimulating perspectives from industry, government and academia. **Professor Massimo Colombo** of the Polytechnico di Milano reviewed the impact of mergers and acquisitions on the global innovation system. **David Evans**, Director of Innovation and Technology at the newly formed Department for Innovation, Universities and Skills described ways the UK is trying to harness science and innovation for growth.

Systematic approach

Fascinating insights into a variety of different corporate approaches were given by Graham Chisnall of GKN, Emmo Meijer of Unilever, Mark Wilson of GSK and Bruce Brenner from Dyson. The key message here was that even amidst the uncertainties of the modern world there were systematic approaches that could be deployed to help manage a response – and take advantage of the opportunities that arise in a rapidly changing environment.

The Symposium's case study sessions focussed on innovation in services, open innovation, use of



scenarios, options and risk analysis and the exploitation of emerging technologies.

Speakers from many organisations took part, offering a varied review of developments in these areas, of great interest to companies seeking ways to develop new business opportunities.

The Symposium dinner was held in Christ's College, and the Vice Chancellor of the University, Professor Alison Richard, joined us to welcome the delegates to Cambridge. In addition to claiming a personal link to the world of manufacturing via the repair of ancient Land Rovers in the field while on anthropological studies, she highlighted the University's willingness to collaborate with the outside world – with flexible arrangements to accommodate all forms of engagement. The IfM is a pioneer of industrial collaboration at Cambridge. Prof. Richard observed that the IfM's forthcoming move to a new building on the West Cambridge site would provide much improved facilities for shared activities.

Next year's Symposium will be on 25–26 September, another good opportunity to explore the future together.

David Probert



Learning lessons from the past to support the emerging industries of the future

Emerging industries will be the focus of the next phase of the IfM's Innovative Manufacturing Research Centre programme, supported by long-term funding from the Engineering and Physical Sciences Research Council. The new project will involve studying how fledgling industries develop in order to find ways to support new ones as they emerge. CTM is involved in contributing to a number of aspects of the research:

- Development and testing of an emerging industries framework to map how new industries have emerged in the past, identifying key learning points, such as barriers and enablers, which can then be used to support current

and future cases of emergence. Establishing a maturity/readiness framework to enable cross-case analysis, providing a basis for practical tool development.

- Using this framework to learn from past and current experience in order to develop guidelines for organisations seeking to create and capture value from emerging, technology-based industries.
- Establishing what start-up companies in emerging industries require in order to exploit their innovations and grow into larger enterprises. Developing practical tools and techniques to support them.

Innovation and firm dynamics: theory and practice

A two-day meeting on 'Innovation and firm dynamics' was organised by Erik Stam and Elizabeth Garnsey of CTM at St Catharine's College, Cambridge in September as part of the IfM's participation in the government-funded Innovation and Productivity Grand Challenge. The meeting brought together leading scholars as well as young researchers interested in how firms and industries emerge and grow.

Research on the theory and practice of innovation and on firm dynamics was discussed, along with their implications for corporate strategy and public policy. The doyen of studies of industry dynamics, John Baldwin of Statistics Canada, provided insight into research methods. He emphasised that sample surveys are not statistically valid with response rates of under 80% because of self-selection bias. To achieve high response rates, iterative selective samples can be used.

Economic research tends to focus on the 'average' firm. However, for the study of innovation and firm dynamics, the whole range of firms are of interest, from those that are very successful to those that are failing. Several solutions to the research problem created by the skewed distribution of firm size and performance were discussed. As well as providing new insights, the meeting strengthened academic networks and facilitated the building of new networks for younger researchers.



CTM runs course for visitors from Taiwan

CTM hosted a three-day executive education course in October for the China Productivity Center, a Taiwanese government agency that provides business and educational support to industry. Each year the Center organises a study mission on innovation and R&D management, supported by the Ministry of Economic Affairs, and the course was arranged as part of the 2007 mission.

Strategic roadmapping

The course was held at Homerton College in Cambridge. There were 20 participants representing a range of sectors. The course focused on strategic roadmapping, providing an overview of the approach, illustrated with examples from practice.

Practical sessions

Practical sessions enabled participants to apply the concepts, with a final activity to support the planning and design of roadmapping initiatives in the participants' own organisations.



CTM helping to identify and develop the skills needed to bring new technologies to market

New technologies demand new kinds of skills if they are to be fully exploited and transferred successfully from the lab to the market place. Identifying these skills and deciding how scientists and technologists can acquire them are two of the issues CTM is helping to address as part of a major new government-funded programme – the Cambridge Integrated Knowledge Centre (CIKC).

Industrial partners help to shape the programme

The CIKC is an interdisciplinary programme involving Cambridge University's Electrical Engineering Division, the Cavendish Laboratory, the Judge Business School and the Centre for Business Research as well as the Institute for Manufacturing. Industrial partners are helping to shape and prioritise the work programme and will enable the provision of pilot manufacturing lines for prototyping.

The CIKC is focused on scientific developments in molecular and macromolecular materials and aims to provide the business and technical expertise and the infrastructure needed to enable new concepts to achieve commercial success.

Skills development

Judith Shawcross joined CTM last summer to work on the project. An engineer who has experience in the corporate world of skills development, Judith's academic interests are in science enterprise. Her work for the CIKC is focussing

on a number of different areas:

- investigating the skill needs of all members of the CIKC in order to make recommendations on what training should be made available
- developing and delivering a new two-week module in Technology and Innovation Management for post graduates to acquire a broad knowledge of the field and provide training in some key skills – to run for the first time in January 2008
- introducing further developments to CTM's existing, Technology and Innovation Management three-day executive training course, to be held 8-10 April, 2008
- reviewing the current provision of training in these areas across the University of Cambridge to identify what is already provided, what could be adapted to meet the gaps and what training opportunities should be developed

There will be a broad range of training and development needs depending on the type of organisation, role undertaken, previous training and experience of personnel. The challenge will be to provide or direct members to training and development opportunities that meet the needs of all these people effectively and develop the skills of their scientists and technologists who are key to exploiting new commercial opportunities.

Workshop explores the skills needed to succeed with 'open innovation'

CTM's Technology Enterprise Group (TEG) held its second workshop on 'open innovation' on 2 October. The event was run as part of a research project, funded by Unilever R&D, which is analysing some of the operational issues of implementing a collaborative innovation strategy.

The workshop focused on the skills needed for open innovation and was divided into a series of presentation and workgroup sessions. Interim findings from case studies were presented, after which workgroups were formed to discuss:

- which skills are fundamental for an open innovation approach and why?
- which of the skills are difficult to gain and why?

The results of these discussions will now provide guidance for the next stage of the project which will examine the organisational culture and context required to allow open innovation to be successfully implemented.

The event attracted representatives from Unilever R&D, Goodman International, Kodak, Rolls-Royce, NESTA, Shell, O2, DuPont Teijin Films, BT, GSK, MBDA, the

Cambridge Integrated Knowledge Centre, Dow Corning, Nokia, P&G and NHS Innovations. These organisations form part of the community of practice that has grown up around the theme of implementing open innovation.

Next workshop to be held in 2008

The workshop was the second in a series of three. The third event will be held in Spring 2008. For more information, please contact Tim Minshall (thwm100@eng.cam.ac.uk) or see:

www.ifm.eng.cam.ac.uk/ctm/teg/openinnovation.html



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

Prize-winning paper describes tool to audit product design

Dr James Moultrie of CTM has been awarded a prestigious prize for his work on the development of a 'product audit' tool to help improve product design.

Dr Moultrie's paper '*Development of a product audit tool*' won the Thatcher Brothers Prize of £1,000 awarded by the IMechE's Manufacturing Industries Division.

The paper, which was co-authored by David Probert of CTM, describes a tool that enables a design team to evaluate their products against a range of criteria. Unlike previous assessment approaches, it addresses the 'whole product' and aims to help designers understand the way in which their decisions influence its usability, desirability and producibility.

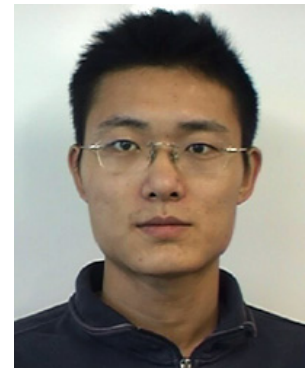


Dr Dilek Cetindamar (above) from Sabanci University in Turkey is spending a year with CTM to work on a number of projects, including a handbook of technology management. Technology management has been a discipline for 50 years but there is still no generally agreed definition of its activities and tools.

In addition, Dr Cetindamar plans to work on two further projects:

- the Chief Technology Officer's impact on firm performance
- how organisational culture affects performance

Lan Tao (above right) has completed his work as a research assistant with CTM on the Innovation and Productivity Grand Challenge project. He is now starting a PhD.



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Diary

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

Nov

29 *The make-or-buy question: are you getting it right?* One-day course
Fitzwilliam College,
Cambridge

Dec

4 *Manufacturing mobility
Setting up manufacturing
operations abroad* Afternoon workshop
Fitzwilliam College
Cambridge

5 *Innovation & Design Management
Club meeting (5 of 6)* Evening meeting
Selwyn College, Cambridge

Jan

23 *Innovation & Design Management
Club meeting (6 of 6)* Evening meeting
Selwyn College, Cambridge