

Technology Management

Quarterly newsletter of the Centre for Technology Management (CTM)



UNIVERSITY OF
CAMBRIDGE

Institute for Manufacturing

May 2004

Overseas students give thumbs up to CTM programme

A one-week technology management training programme, run by CTM for overseas researchers and industrialists, was such a success it is to be repeated next year.

The 54 participants are from the Chevening Technology Enterprise Scholarship (CTES) programme, a one-year post-doctoral scheme that funds non-EU nationals to study in the UK. Its aim is to produce highly skilled, technology-based professionals, who will go on to work in UK companies or maintain close links with UK industry from abroad. The programme is run by the London-based Centre for Scientific Enterprise, with funding from the UK government.



From innovation to commercial outcome

All participants (known as CTES Fellows) learn how to take a technology-based innovation through to a commercial outcome, managing all the major steps on the way. During their year in the UK, the Fellows come together to receive five, one-week modules of business training.

- Module 1: Introduction to commercialising technology (Imperial College)
- Module 2: Market opportunities for technologies (London Business School)
- Module 3: Routes to commercialisation (London Business School)
- Module 4: Technology management in the established firm (CTM)
- Module 5: New venture creation (London Business School)

Technology management in the established firm

Module 4 was delivered by a team from CTM in the beautiful surroundings of 15th-century Jesus College, Cambridge. The module aimed to provide delegates with a working knowledge of:

- how technology can be managed in practice, supported by appropriate process-based frameworks
- understanding which products and components should be made in-house, and which should be outsourced
- managing new product development and introduction processes
- integrating technological considerations into business strategy and long-range planning processes



- exploring and communicating the value of technology investments

The module was divided into a series of taught, interactive sessions leading into practical, group-based activities in the middle of the week.

Time was also allocated to support learning around issues of team building, group dynamics and presentation skills. Special interest seminars held during the lunch breaks provided an opportunity to examine new areas of technology management research. Visits to Cambridge science parks and innovation centres also provided a flavour of how technology is being exploited commercially in the Cambridge area.

Feedback from the CTES Fellows on the Cambridge week and the CTES programme overall has been very positive. It has just been confirmed that the CTES programme will run next year – with double the number of places. To cope with this increase, CTM will be running its training module twice (two weeks back-to-back) in April 2005.

For further information on the CTES programme, see:

www.ctesnet.com

Bridging the gap – managing across boundaries

Managing technology and knowledge across organisational boundaries

Technology Management
Network Forum

29 April, Fitzwilliam College
Cambridge

Organisations increasingly need to manage technology across inter and intra-organisational boundaries. This Network Forum event explored this issue with a series of informative presentations and discussions. The academics and industrialists taking part covered a range of topics including accessing technology and knowledge, software outsourcing, knowledge integration and product development collaborations.

Industrial perspective

Adrian van den Heever of Philips Digital Systems Laboratory (PDSL) discussed the challenges of multi-site advanced development of consumer electronic products. PDSL has seven sites globally and relies upon strong project management for effective inter-site communication. While there is currently a practical limit on the number of sites that can be involved, multi-site working will soon be a fact of life. To respond to the challenge, Philips is creating a global engineering community to manage knowledge in the context of business strategy.

The modern pharmaceutical industry is composed of multiple components: academia, biotech sector, contract research organisations and larger pharmaceutical companies. David Cavalla of Arachnova described how a virtual R&D pharmaceutical strategy can be used to incubate novel projects for partnering. Virtuality was defined as product development without using in-house laboratories or bench scientists. While acknowledging both the advantages and disadvantages of this approach, David illustrated the savings in time



Francis Hunt of CTM presenting at the Network Forum

for outsourced development work in Phase I, II and III of pharmaceutical R&D. Contractual outsourcing is complemented by external sourcing of IP (through licensing) and expertise (by collaboration).

Academic perspective

Companies in the music, film, drug and financial services industries offer insights into how an organisation can access knowledge across venture boundaries. Professor Charles Baden-Fuller, from Cass Business School at City University, described several case examples including a comparison of Celltech and PPL-Therapeutics. A novel business model was proposed in which organisations are valued and traded as options, thus avoiding the pitfalls associated with Net Present Value approaches.

Solutions-based approach

Tim Brady from the University of Brighton described a project exploring the management of internal and external interfaces to deliver 'integrated solutions' (product/service combinations providing high-value offerings to large customers over the full product lifecycle).

With collaborators including Alstom, Cable & Wireless, Ericsson, Thales and WS Atkins, this innovative project challenges traditional 'product-forward' thinking, where services are added to the product as an afterthought. Instead, a 'solutions-based' approach starts with the desired customer outcome and works backwards to the development of

integrated products and services.

It is evident from both academic and industrial perspectives that managing technology across organisational boundaries is a significant issue in technology management.

A current project at CTM is investigating the barriers that prevent technological knowledge 'flow' as well as mechanisms that support it. For more information, contact: Clare Farrukh: cjp2@eng.cam.ac.uk

The Technology Management Network forums are held once or twice a year and are open to industrialists and academics. Contact: ctm-enquiries@eng.cam.ac.uk

Roadmapping in Japanese...

T-Plan “すぐできる”

実践 “戦略ロードマッピング”

—成功への“近道”をプランニング—

The CTM roadmapping guide, 'T-Plan: the fast start to technology roadmapping - planning your route to success', has been translated into Japanese, by Prof Akio Kameoka of the Japan Advanced Institute of Science and Technology (JAIST). This forms part of a wider initiative in Japan to support technology management, encouraging closer links between industry and universities. Publication of the Japanese version coincided with the delivery of two roadmapping courses in Tokyo in January, in collaboration with Purdue University, hosted by Professor Kameoka.

Roadmapping activities in Cambridge continue to grow. We are currently working on the second edition of the T-Plan guide, due to be published later in 2004. Contact Rob Phaal: rp108@eng.cam.ac.uk

Wake up – it's technology time!

Professor Hugo Tschirky, Head of Technology and Innovation Management at the Swiss Federal Institute of Technology, argues that technology management is so important it should form a core element of general management.

The ground-breaking effects of technology are well recognised. Advances in transport and telecommunication technology have reduced the scale of our world to the dimensions of a village. Biotech and nanotech research are helping to produce revolutionary developments in health, while information technology and the internet are breaking down industrial boundaries, creating currently inconceivable business opportunities. The prospects for new technologies in the 21st Century are no less exciting.

Europe's innovation gap

Several studies have highlighted the importance of preparing managers to deal with this rapid pace of technology change, identifying a significant gap in current European performance:

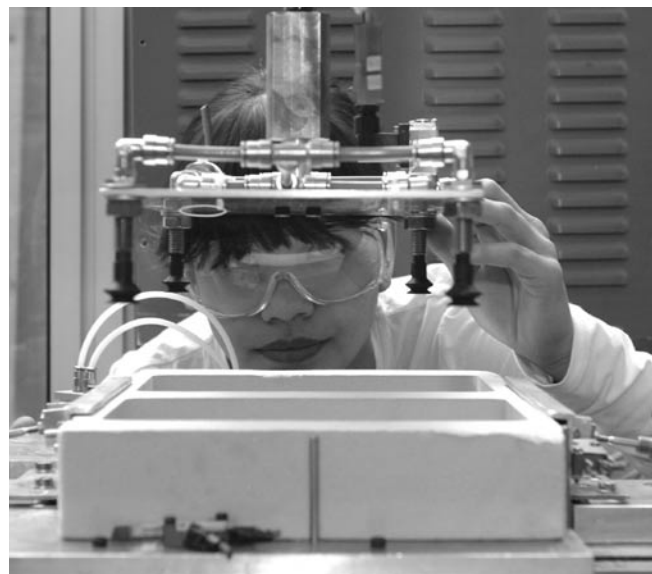
- The European Commission report 'Green paper on innovation', pointed out that Europe's industrial base has a limited capacity to convert scientific breakthroughs and technological achievements into commercial successes. It strongly recommended the need to develop technology and innovation management, since these disciplines 'are not yet adequately used in the European Union.'
- In 2000, the Union of Industrial and Employer's Confederations of Europe (UNICE) published a benchmarking report, 'Stimulating creativity and innovation in Europe', that declared: 'companies based in Europe have failed to match the performance of innovative companies based in the US.' This view is reiterated in the UNICE Economic Outlook of Spring 2003.

This 'innovation gap' in European enterprises is not helped by a gap in technology management competence. It has been argued that competitive threats can only be countered effectively by developing technology management as the 'missing link' between engineering, science, and general management.

The technology management paradox

However, there is a pervading attitude among top management that technology is an issue for lower-level management, with the result that the opportunities and the perils of technology deployment are given little attention. Some portions of academia have begun to recognise the need to improve competence in technology management.

However – and herein lies the paradox – most general management literature is curiously silent on issues of technology and innovation management. Technological issues are usually mentioned as just one of many influences on an enterprise, while functions such as marketing, finance, and sometimes legal and economic issues, are well represented. The implications of this are of such



importance that a paradigm shift in approach is required. Instead of being the missing link, technology management must become a core element of general management.

European universities collaborate

The need to develop a greater understanding of ways to manage technology-driven enterprises has been recognised by the formation of the European Institute for Technology and Innovation Management (EITIM). This group was established in 2000 as an active research and teaching collaboration between Cambridge University, École Centrale Paris, Chalmers University of Technology, Technical University Eindhoven, Technical University Hamburg, University College Dublin and the Swiss Federal Institute of Technology. Its recent book, 'Bringing technology and innovation to the boardroom', published by Palgrave, is directed at both practitioners and academics and exemplifies the paradigm shift that is required from 'managing technology' to 'managing technology and innovation driven enterprises'.

www-eitm.eng.cam.ac.uk

This article is an edited version of one from the Spring 2004 issue of IfM's Cambridge Manufacturing Review.
www.ifm.eng.cam.ac.uk

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

Events

EITIM – Supporting technology and innovation research

Following its recent publication 'Bringing technology and innovation into the boardroom', the European Institute for Technology and Innovation Management (EITIM) has put in a proposal to the EU Marie Curie programme for a series of events to support the research community.

Led by CTM, and building on our well-established annual Technology Management Symposium, the series would develop the capabilities of scientific researchers and managers in industry, as well as academic researchers in technology and innovation management.

Developing the capabilities of researchers and managers in technology management

The proposed events include annual summer schools for industrial researchers, research methodology workshops for university staff and a series of network meetings to bring the two communities together and develop the research agenda.

The proposal has just been submitted. We should learn the outcome within the next three months and, if successful, the programme would run for three years starting January 2005.



EITIM's recently produced book, 'Bringing technology and innovation into the boardroom', published by Palgrave. www.palgrave.com

Contact us

Centre for Technology Management
Institute for Manufacturing
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

May

27th	<i>Annual members' meeting</i>	Churchill College Cambridge
------	--------------------------------	--------------------------------

June

22-23rd	<i>Technology roadmapping</i>	New Hall Cambridge
---------	-------------------------------	-----------------------

July

6th	<i>Academic Network Forum Software development & sourcing</i>	Institute for Manufacturing Cambridge
7th	<i>Assessing the value of new technologies</i>	Institute for Manufacturing Cambridge

September

29-30th	<i>CTM Symposium Emerging technologies</i>	Downing College Cambridge
---------	--	------------------------------