

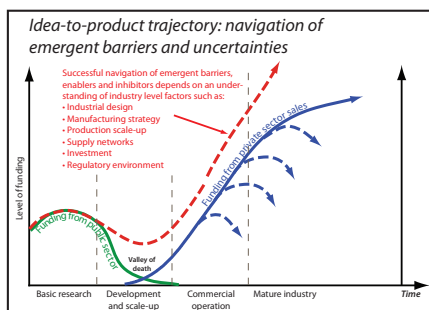
Technology Management

Quarterly newsletter of the Centre for Technology Management (CTM)

February 2009

Making sense of emerging industries: research and practice

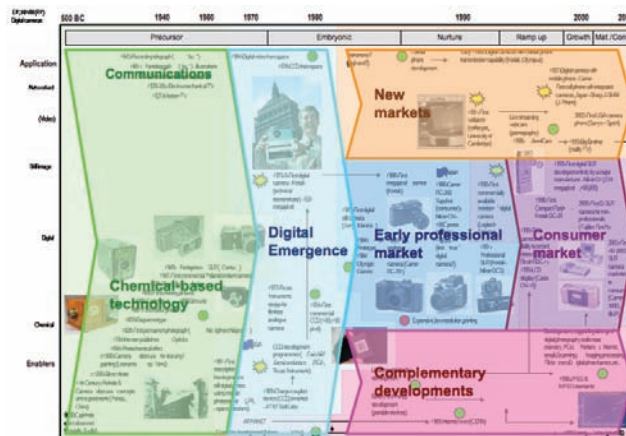
The UK, and every other advanced industrial nation, is continually striving to identify, nurture and develop the technologies, companies and ultimately the industries that will underpin the economy of the future. Particularly in today's difficult financial climate, governments and businesses are looking for better ways to address this timeless challenge. The UK has traditionally been successful in generating new science and technology, but less successful in building on this to establish enterprises and industries that remain competitive on a global scale.



The investment cycle from research to production - showing the 'valley of death' between research and commercial operation

The IfM's 'Emerging Industries Programme' (EIP) is an ambitious attempt to address this challenge. It brings together the different research perspectives of our various Centres to work on many aspects of the challenge, from a better understanding of how emergence occurs, to practical help for small businesses getting started in a new field. The project themes are:

- Managing creations and transitions
- Design in science: designing disruption



A typical 'emergence map' plotting the development of the digital camera industry, starting with the observation of the 'pinhole' effect by Aristotle in 500 BC

- Manufacturing strategy for start-ups
- Investment framework
- Policy and regulation
- Supply networks

CTM is directly involved in four of these projects, with a leading role in the first two.

Managing creations and transition uses mapping techniques to identify enablers and barriers that occur at the transition points during the emergence of a new industry. It aims to draw lessons from past examples and develop guidelines for organisations seeking to create and capture value from emerging, technology based industries.

The role of design

Design science: designing disruption aims to understand the potential for interactions between scientists and designers to accelerate the application of scientific discoveries. It will explore how the involvement of professional (industrial) design expertise early in scientific research could improve the potential for its future application.

Novel 'emergence maps' of key industries are already revealing significant common features in historic examples, taken across some 20 different sectors, including the emergence of digital photography (above).

There is much interest in the findings from this programme, and early results will be at the heart of the 2009 Symposium on 24-25 September at Downing College. Run in collaboration with others in the EIP, the theme of the event is *Creating opportunities from uncertainty: navigating industrial emergence*.

Examples will also be drawn from the work of other major EPSRC programmes including the Regenerative Medicine (REMEDI) and Innovation and Productivity Grand Challenges, and the CIKC Molecular and Macromolecular Materials project at Cambridge. The Symposium aims to highlight the key lessons that can guide managers, policy makers and researchers through these challenging times.

For more information, visit <http://www.ifm.eng.cam.ac.uk/ctm/symposium15/>

Corporate documents – a mine of information

With globalisation and the constant need to innovate, interest is increasing in developing ways for companies to keep abreast of the latest technological developments. Technology Intelligence (TI) systems offer effective ways of identifying relevant information.

Previous research by CTM has looked at the different methods companies use to look for information about new technologies. Dr Sungjoo Lee, a visiting scholar to CTM has been carrying out further research into the so-called MINE mode. Document ‘mining’ uses IT to make sense of an organisations internal repositories, and is a way of ‘digging deeper’ into existing data to identify appropriate information.

Document mining framework

The study found that document mining becomes more complex when attempting to interpret a large volume of lengthy documents. To address such issues the research focused on understanding how organisations can obtain TI information systematically. By interviewing several companies in 2008, Dr Lee was able to develop a document-mining framework. The framework, in the form of a relational table, shows what TI information could be provided when a specific data mining task is applied to a specific document.

The study also reviewed 43 commercial document-mining software systems and categorised them based on their functionalities. This could be used to guide users to the most effective software system to support their customised document mining.

The study is expected to give guidance to TI operatives and support the effective use of document data, helping managers to establish and operate document-mining activities within their own organisations. A paper has been submitted to the Technology Analysis and Strategic Management Journal. Research into this topic is ongoing and if you would like any further information on the project, please contact Sungjoo Lee (prinlee@snu.ac.kr) or Letizia Mortara (lm367@cam.ac.uk).

Technology and innovation management course

In January CTM staff delivered a 2 week module on Technology and Innovation Management to 25 of Ifm’s Masters students and 5 selected members of the University of Cambridge Integrated Knowledge Centre community.

The course, now in its second year, involves contributions from many CTM staff and uses a variety of delivery methods including interactive lectures, case studies, industry visits and many exercises to put the theory and tools into action. One student commented that the course was “By FAR the best module on the course so far”. For more information about the TIM module please contact Judith Shawcross on: jks45@eng.ac.uk.



A shorter three-day version of this course, for industry executives, is being run from March 31 to April 2, 2009 at Jesus College, Cambridge. See: www.ifm.eng.cam.ac.uk/service/events/info/tech_innov.html

European forum focuses on open innovation

The European Institute for Technology and Innovation Management will be holding its fifth annual Forum in Cambridge on the 14 and 15 May 2009.

The theme this year picks up on current interest in open innovation, and explores issues related to IP, collaboration,

technology convergence and cultural issues. Improving the return on investment in technology and maintaining the drive for innovation in times of economic stringency will be a key focus.

With stimulating inputs and exchange from leading companies and academic

partners, the Forum promises to live up to its tradition of exploring and resolving some of the key concerns of Chief Technology Officers from around Europe.

For further details see: www.eitim.org and click on ‘The EITIM Forum’.

EITIM
Open innovation and the CTO

Save the Date
Details to follow soon

5th annual
Senior Management Forum
Bringing technology and innovation into the boardroom

14 - 15 May 2009
Cambridge, UK
Location: The Moller Centre

IP in semi-open technology collaborations
Science industry collaborations
Combining technologies and divergent cultures
Collaboration in platforms and standards
Open science approaches in hardware industries
Open innovation in the defence industry
Keeping innovation going in times of financial stringency

www.eitim.org

An international initiative to promote better decision-making regarding technological commitments for enhancing the innovative and competitive performance of European enterprises

The European Institute for Technology and Innovation Management is a collaboration between industry and nine leading European technical universities.

Encouraging innovation means taking some risks

The importance of creating an environment that encourages greater risk taking and does not stigmatise failure has emerged from a survey of technology managers investigating radical innovation and 'intrapreneurship'.

The survey was recently undertaken by CTM as part of the government-sponsored Innovation and Productivity Grand Challenge (IPGC).

Intrapreneurship

Intrapreneurship is the range of entrepreneurial activities that are ongoing *within* an established organisation. Research by IPGC found that a firm's organisational culture is often seen to inhibit intrapreneurs and their attempts at innovation.

In order to disseminate some of the provisional findings from this survey, CTM researchers held an afternoon workshop on 22 January at the Institute for Manufacturing.

The workshop was led by Simon

Ford and David Probert, and included representatives from eleven companies: Bakkavor, BMT Defence Services, BP, British Sugar, CSR, Eurotherm, GKN, Rotork, Symbian, Vodafone and Xaar.

The survey identified areas where firms could make changes in order to support intrapreneurship. These include creating an environment in which:

- greater risk-taking is encouraged
- it is accepted that the failure of radical innovation projects is a natural part of the learning process
- it is straightforward to achieve organizational buy-in
- firms have innovation incentive programs that provide employees with ownership in radical projects

Other ways to support innovation

Other areas that were identified as needing significant improvement included the implementation of a centralised idea management system, a dedicated unit for

providing support to radical innovation projects company-wide, and the coaching of radical innovation teams by senior managers.

Forum for discussion

As well as disseminating some of the provisional findings from the survey, the workshop provided a forum in which the results could be discussed with others facing similar innovation challenges. Some of the particular issues that were raised included the apparent need for large firms to try to behave as if they were small firms and what selection processes should be put in place to ensure that 'good' ideas were not rejected by the corporate system.

The researchers are very grateful to all firms that participated in the survey and to those that attended the workshop. Further workshops are planned for the spring and anyone interested in attending these is encouraged to get in touch with Simon Ford: sjf39@cam.ac.uk.

New home for Institute nears completion

CTM will be moving with the rest of the IfM to a new building on the University's West Cambridge Site this summer. The Alan Reece Building, scheduled for completion this April, is named in recognition of one of the building's major donors. It will form a centre of research excellence and a hub for academic-industry interaction, and will provide:

- innovative teaching and research facilities
- an Industrial Design and Innovation Studio
- state of the art equipment for industrial laser systems, inkjet and RFID application

Environmental issues have been an important consideration in the design of the building which will be heated by a biomass boiler and will feature large amounts of natural materials.

The design provides well proportioned social and working spaces which are all readily accessible from the core circulation space.

The 4,400m² building will be a major addition to the University's West Cambridge campus for science and technology. It will join an existing concentration of related research centres, as well as the Hauser Forum; a focal point for regional entrepreneurship and technology transfer.

More information on the new IfM building can be found at: <http://www.ifm.eng.cam.ac.uk/westsite/>



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 people: comings and goings...

This month we are sorry to be saying goodbye to Tae Hee Moon, Sungjoo Lee and Catherine Mulligan.

Tae Hee returns to Korea, having completed his work with us on open

innovation, to take up a post with LG Telecom. Sungjoo has carried out a range of interesting work related to data mining, linked to technology intelligence, and will join the staff at Ajou University, South Korea. Catherine is returning home to Australia for family reasons. We wish them all well.

Welcome to Michele Routley, who is joining us as a Research Associate on the Emerging Industries Programme,

having had previous practical experience of managing technology at TWI.

Finally it's congratulations to Charles Romito, who submitted his thesis 'Technology Evaluation: Structure and Components of the Process' at the end of December, passed his viva in early February and is now beginning his new career with McKinsey.

Our best wishes to all of them in their new ventures.

Opportunities for UK companies in China

China is rapidly developing new capabilities across the manufacturing value chain, over and beyond its traditional role as a mass producer, according to a new report. The study, by researchers at the Institute for Manufacturing's Centre for International Manufacturing (CIM), identifies many new opportunities for UK companies as a result of China's

continued rapid economic growth.

The report, 'Understanding China's manufacturing value chain', includes case studies in White goods, TFT-LCD and Pharmaceutical sectors. Potential opportunities for UK firms in China include:

- Forming partnerships with new Chinese centres of expertise in R&D, production and service
- Supporting China's increasing internationalisation by sharing UK

skills in the management of multi-domestic operations and Mergers & Acquisitions

- Building partnerships between UK and Chinese universities, providing opportunities for technology transfer and training
- Engaging with the relatively immature Chinese service sector

The report is available at: www.ifm.eng.cam.ac.uk/cim/valuechain_report.html

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Diary

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

Mar

5	<i>Strategic roadmapping</i>	One-day course Murray Edwards College Cambridge
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May

14-15	<i>EITIM 5th annual Senior Management Forum 'Open innovation and the CTO'</i>	Two-day Forum Møller Centre Cambridge
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Jun

10-11	<i>Strategic roadmapping</i>	Two-day course Murray Edwards College Cambridge
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