

Technology Management

Quarterly newsletter of the Centre for Technology Management

November 2000



UNIVERSITY OF
CAMBRIDGE

Network goes from strength to strength

The EPSRC-funded Technology Management Network has fulfilled an important role since its launch in 1998, providing an opportunity for academics and industrialists to exchange good practice and build contacts around issues of common interest.

Although the present EPSRC grant has now come to an end, Network activities are so well established that we are confident they will continue on a self sufficient basis.

Managing innovation

The most recent meeting of the Network was held in Cambridge, UK on 22 September.

The morning consisted of a series of plenary presentations and discussion sessions.

The first presentation was by James Utterback (right), who spoke about '**Managing innovation: new challenges**' from his research at MIT



looking at the survival of firms in fast changing industries. Rather than examining 'new' firms or 'large' firms the work focuses on the progression of firms from start-up through growth, dominance, decline and renewal. He suggested that to achieve sustained success, and to move from excellence in product design to

elegance (tasteful simplicity and function), firms need to blend their strategy, technology, market and economic perspectives and 'play to win'.

Developing technology

This was followed by David Tainsh who gave an account of '**Developing a process for technology management**' in Glaxo Wellcome. He explained that technology development was found to be highly fragmented and very thinly spread, in stark contrast to the high profile and well resourced new product delivery process. A high level initiative was sponsored by the New Product Delivery Board and a full-time leader was appointed for the study. External facilitation during four workshops involving global representation and extensive consultation has resulted in commitment to a specific technology management budget for 2001.

Innovation in supply chains

Fiona Reed of the PRIME Faraday gave an overview of her work in the area of '**Technological innovation and the supply chain**' which indicates that large companies are devolving responsibility for technology through the supply chain. Key conclusions to date are that this represents a significant challenge for smaller suppliers with limited

resources for technological innovation and that there may be signs that the overall technological capability of the supply network could be diminished.

The morning was brought to a close by John Kelly reviewing his experience in '**Managing University Technology Centres**'. Until very recently John was Chief of University Research Liaison at Rolls-Royce, which has a large number of UTCs. John also outlined a draft proposal to examine the '**Assessment of engineering research and its technology transfer**'.

The afternoon was spent in smaller groups discussing knowledge management, technology transfer, valuation and IP and collaboration.

For details of the Network please see:

<http://www-mmd.eng.cam.ac.uk/ctm/Network.html>

Clare Farrukh

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Route mapping strikes a chord at DTI seminars

The work of Clare Farrukh and Rob Phaal on product technology route mapping was featured at two of the DTI's seminars on Successful Product Development earlier this year. Domino described their experiences with the technique and the scope and benefits of their collaboration with CTM. We received several calls from interested companies as a result.

The DTI has sponsored a series of seminars on product development for the last seven years. The aim of the series is to encourage more manufacturing firms to develop their own products.

It is observed that product developers typically make higher margins than sub-contractors and they are correspondingly more successful and stable. The DTI wants to encourage the UK's 120,000 manufacturing sub-contractors to move up the food chain by joining the 20,000 or so product developers. One theme of the seminars, therefore, is frank and practical reports from companies on which product development methods worked for them and which did not.

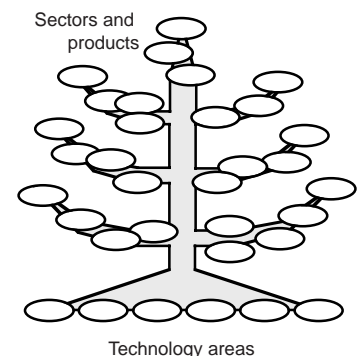
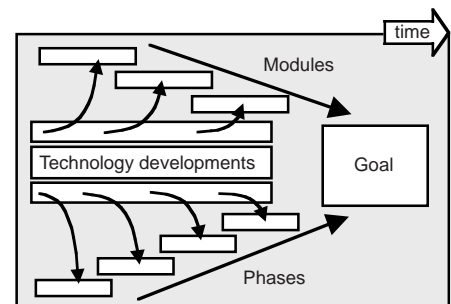
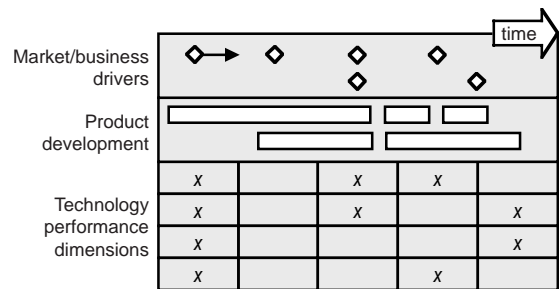
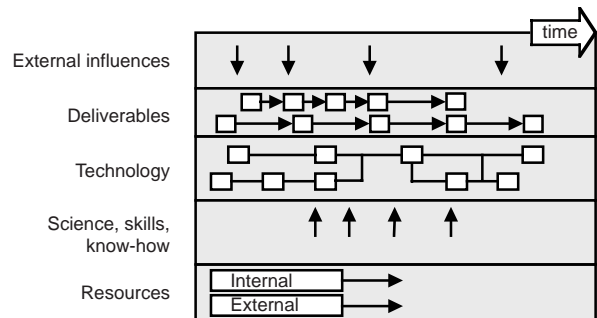
Funding

Funding is naturally a big obstacle for hard-pressed manufacturers taking the risky step into product development, so another theme was how to use the European Union Framework Programme as a source of money. Practical illustrations came from companies working in fields as far apart as CAD tools and effluent measurement.

Route mapping struck a chord with many companies at these seminars, probably because of the way it facilitates technology planning while keeping the focus clearly on deliverable products. Strategy should always start in the market place but in most companies – certainly most manufacturing ones – the spotlight soon moves on to the products (be they physical ones or services) that are actually going to be sold. Route mapping was pioneered by large companies such as Motorola but it is clearly just as suitable and potent a tool for smaller ones.

These seminars have reached more than 6,000 people so far. This year more than 700 delegates came to the six events around the country; a bigger and better series is already scheduled for April 2001.

Rick Mitchell of Domino Printing Sciences reports on two DTI seminars which featured CTM's successful route mapping approach to technology planning.



Some examples of technology route maps

New software tool helps companies choose the right technology

A software tool is being developed to assist industrial managers in selecting the most appropriate technology for their organisations. The Technology Selector is based on a number of industrial case studies concerning the selection of 'packaged' manufacturing technology. Packaged technologies are forms of technologies that do not require extensive in-house R&D after acquisition (e.g. manufacturing equipment).

Filter approach

The Technology Selector uses a 'filter' approach where candidate technologies that do not have the potential to fulfil the requirements of the organisation and that are unsuitable for adoption are gradually eliminated from the selection process. A comprehensive list of both qualitative and quantitative criteria is presented. Emphasis is placed on both technology-specific factors, as well as other generic investment justification factors. Users have the freedom to change the proposed factors and/or add new factors which reflect their specific organisational needs.

A method of weighting and ranking is applied for comparing qualitative factors whilst the quantitative aspects of the decision are based on financial data and the resulting accounting measures such as payback, NPV and IRR.

User-friendly

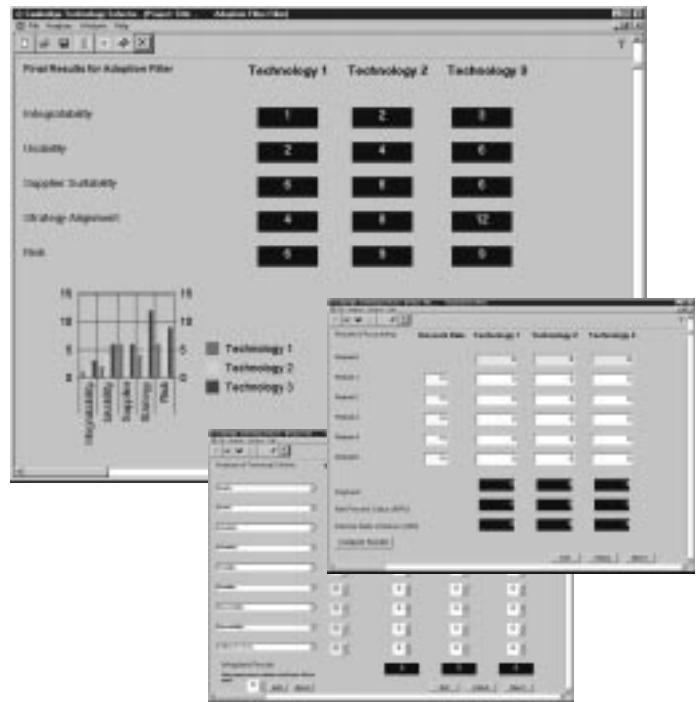
In order to ensure simplicity and user-friendly operation of the software, an online help facility is incorporated, in addition to the user guide which accompanies the installation CD.

The Technology Selector is currently being tested in a number of companies to evaluate its industrial relevance and applicability and the response has been very encouraging.

In addition to supporting selection decisions, it has been useful in prompting the identification of other selection criteria specific to the company, facilitating discussion and exchange of ideas between members of the selection team and supporting justification of capital expenditure proposals. A wider circulation of the software will follow through its commercialisation in the near future.

Try it out in your company

Members wishing to apply the Technology Selector and receive facilitation, or those requiring further information can contact its developer, Noordin Shehabuddeen. (E-mail: ntmhs2@eng.cam.ac.uk) Telephone: + 44(0)1223 338 189)



Screen shots from the new technology selection software tool developed by Noordin Shehabuddeen.

Coming events

Members' meeting on Knowledge Management 15 December 2000

This meeting for CTM members is being held at the new and very impressive Post Office Innovation Lab near Rugby. It is a morning meeting, concluding over lunch, with the objective of setting up a Centre 'benchmarking' group to focus on Knowledge Management practice.

In addition we are hoping to arrange a visit to the Parcel Sorting Office in Coventry the previous evening. Booking arrangements will be sent to member companies shortly.

Industrial Forum *The challenge of product innovation* 30 January 2001

The Centre is running an Industrial Forum in January 2001 on the subject of product innovation. The aim is to explore approaches to the development of really new products for which market demand is often uncertain. Other topics will include collaboration with external product designers and technology providers. Our current New Product Introduction (NPI) related research projects are focusing on the integration of industrial design into the NPI process and on the management of NPI collaborations. We are keen to identify potential discussion partners amongst the Centre membership. If you are interested, please contact Pete Fraser (email pvf20@eng.cam.ac.uk).

Technology management research at Cambridge

- New product introduction for SMEs
- New product introduction collaboration
- Strategic technology management
- R&D project selection
- World class software delivery
- Product planning
- Technology change
- Technology management: a process approach
- Decision support
- 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

Conference report

Managing across boundaries
British Academy of Management
Conference 2000, Edinburgh, 13-15
September 2000

Several hundred papers covering a broad range of subjects within the general management discipline were presented. Issues of cross-boundary integration at both the softer organisational and cultural level, as well as at the harder, systems level were explored in an interesting array of papers. The 'innovation' stream of the conference provided an opportunity for stimulating discussion on R&D management, new product development, and knowledge management aspects of innovation.

Cambridge Enterprise Conference,
1-2 September 2000

The third Cambridge Enterprise

Conference was held at Queens' College, with the theme of "Creating and sustaining growth". Some 200 delegates attended sessions which included: growing businesses in tomorrow's world, measuring the value of growing businesses, and where and how to find funding. Speakers came from industry and academia, and included Guy Kawasaki, formerly of Apple Computers, who gave the keynote speech, entitled "Rules for revolutionaries".

42nd conference on Operations
Research (OR42) - Swansea
University, 12-14 September 2000

Among the interesting presentations was the keynote address by David Parlbly of KPMG on Intellectual Capital Measurement. He noted that on average a company's market capitalisation was three times its book value and closer to twenty

times for Microsoft. In the knowledge economy, tools for auditing intellectual capital and for supporting associated investment decisions are becoming increasingly important.

IEMC 2000 in Albuquerque, New
Mexico, 13-15 August

The Engineering Management Society of the IEEE held this international conference on the theme of 'Leading technology change: management issues and challenges'. Around 140 papers were presented including a CTM paper, 'Practical frameworks for technology management and planning' (Rob Phaal, Clare Farrukh and David Probert). Useful contacts were made with several other presenters and attendees. The next conference will be held in New York in October 2001 and in Cambridge in July 2002.

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Quarterly Diary

November

9th	Half-day seminar Cambridge	<i>Successful 'Total Product Design': Learning from the experts & their experience</i>
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December

15th	Members' meeting Post Office Innovation Lab Rugby	<i>Knowledge Management</i>
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January

30th	TM Industrial Forum Cambridge	<i>The challenge of product innovation</i>
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