Technology Management

Quarterly newsletter of the Centre for Technology Management

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UNIVERSITY OF CAMBRIDGE
Institute for Manufacturing

Germany – for so long viewed as one of the strongest economies – has been suffering a serious downturn. Do new technology companies hold the answer?

Will technology entrepreneurs drive Germany's recovery?

Until the end of the last century, Germany was deservedly trumpeted as a *wirtschaftswunder* – an 'economic miracle' – that had rebuilt itself from a war-ravaged wasteland into one of the world's strongest economies. German technology-based companies were held up as exemplars in their field. In recent years, factors such as the impact of the global economic downturn, the huge ongoing cost of re-unifying East and West, and the inflexibility of some German companies and industries have led to a substantial slow-down in the German economy – it now has the slowest growth rate in the European Union.

Seeking a solution, the German government looked to the US. The technology entrepreneurship boom had revitalised the US, and other economies had benefited from adopting policies that supported new venture creation activities (see *Cambridge entrepreneurs lead the way*, page 2). Technology entrepreneurship was thus identified by Germany as one of the key activities to encourage.

Public and private sectors worked together to deliver a range of programmes and initiatives focused on stimulating technology entrepreneurship. Some examples included:

Finance – the Federal and Regional governments teamed up with private sector investment organisations to deliver a series of funding streams targeted at early stage technology ventures.

Technology transfer – in a controversial move designed to encourage universities to focus resource on technology transfer activities, ownership of academically generated IP was shifted from individual professors (where it was often not exploited effectively) to the universities.

Education – universities were encouraged to set up entrepreneurship centres and to run business plan competitions.

National networking competitions – the Federal Government launched a number of funding competitions for regions and clusters. These included the "BioRegio" competition to stimulate the growth of biotechnology clusters.

Regional initiatives – individual regions launched schemes to support technology entrepreneurship. The "Offensive Zukunft Bayern" was a Bavarian initiative promoting Munich as Germany's leading high tech cluster.

In the short term, there were some encouraging results. Clusters of exciting new technology ventures began to form and some of these companies then floated on the Neuer Markt (a new national market for shares in early stage ventures) where they were rewarded with spectacular share price valuations. Universities and research institutes began forming spin-out ventures and investing in new technology transfer activities, such as business incubators and science parks.

With the bursting of the dot com

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Cambridge entrepreneurs lead the way

Cambridge is held up as one of the most successful regions for technology entrepreneurship in the UK. It has grown from being home to a handful of small technology-based companies in the 1960s to a cluster of 1,500 companies employing over 35,000 people in 2003.

Unlike Germany, much of this Cambridge phenomenon was driven by the initiative and energy of key individuals and private sector organisations rather than Government schemes.

Many of the new companies have links with Cambridge University but very few are direct spin-offs from it. This may be changing. Recently the region has benefited from a number of Government-funded initiatives to stimulate entrepreneurship within the university, including the Cambridge Entrepreneurship Centre, the University Challenge Fund (for seed investments) and enhancement of the activities of the Technology Transfer Office. A recent research project[1] identified 180 technology ventures established by graduates of the University in the last 10 years, with most of these set up in the last three years, and with a growing proportion operating in biotechnology.

The impact of proposed changes to Cambridge's IP policy (moving ownership from the individual academic to the University, as happened recently in Germany) will be watched with great interest over the coming years.

• See CTM's working paper *Technology and knowledge based business in the Cambridge area* by Garnsey and Heffernan, for a fuller account of Cambridge's high tech developments.

[1]http://www.cec.cam.ac.uk/research/cambridgestartups.html

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bubble, a less rosy picture emerged. The Neuer Markt collapsed; companies that had received 'reduced risk', matched start-up funding from the government found it almost impossible to get further investment; and investors looked at many of the university spin-outs and saw applied research projects rather than market focused businesses.

However, the process of changing an economic culture is never quick, and many of the activities undertaken in the last few years should bear fruit in the medium to longer term. Some people argue that Germany needs to suffer a crisis in order to force it to make the structural changes

Germany's road to recovery

necessary to let technology entrepreneurship flourish. With unemployment currently at around 10 per cent this crisis may be approaching.

If Germany can continue to apply its superb science and technology base to global market opportunities, via entrepreneurial ventures, this could yet be the route by which Germany is able to regain its wirtschaftswunder status.

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Product development project earns high praise

CTM's project studying new product collaborations, which finished early last year, has received high praise from the funding body's review panel.

Managing collaborations

The project, conducted by Mike Gregory, Pete Fraser, Claire Rose and Clare Farrukh, sought to understand how small and medium sized companies might improve the management of product development collaborations.

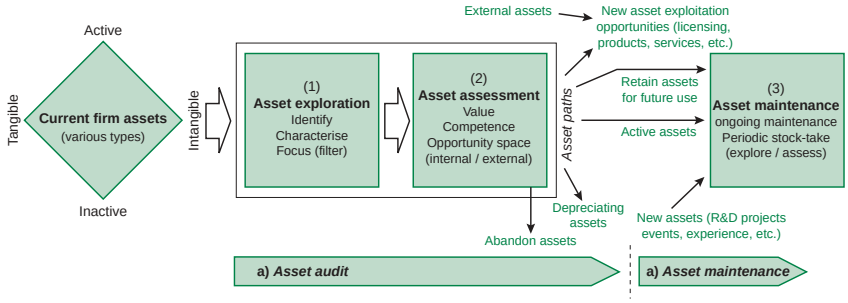
Research outputs included a workbook containing managerial guidelines and a range of tools, including a collaborative maturity audit, a project life-cycle analysis, a collaboration checklist and a questionnaire.

Research quality

The project's research quality, research planning and practice and potential scientific impact were singled out for particular praise by the assessment panel of the funding body, the Engineering and Physical Sciences Research Council.

Making the most of what you know

Technological knowledge is increasingly recognised as a valuable asset and source of sustainable business performance. Such knowledge can be considered an 'intangible' asset, in that its value is not usually represented in the company's balance sheet – although it may be reflected in the share price.



Untapped value

The Institute for Manufacturing has recently launched a feasibility project to explore how a firm's intangible asset base can be 'mined' to identify untapped value. The project brings together two Research Centres within IfM: Technology Management and Strategy and Performance.

A forum was held in December to explore the industrial relevance of this concept, and to test a preliminary process framework. The event was well attended, with more than 20 participants, and included case studies from Rolls Royce, Dana Corporation and Oakland Innovation and Information Services. Companies involved in this project will have the chance to direct the focus towards areas of direct relevance to their business.

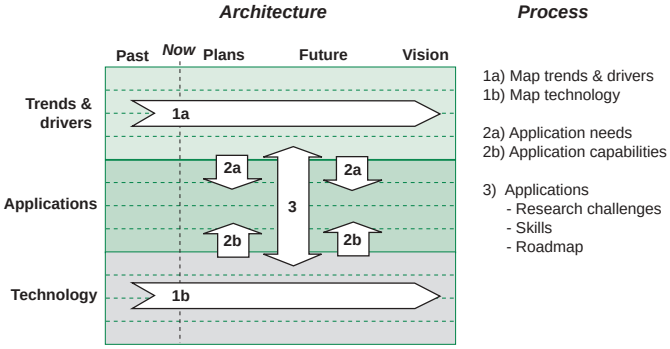
Flexible research approach

IfM is able to carry out this kind of feasibility project thanks to its funding as an EPSRC Innovative Manufacturing Research Centre. The IMRC grant has enabled a more flexible approach to research within the Institute, allowing researchers to explore a wider range of issues and stimulating collaboration between Centres.

Faraday Partnerships define research goals

CTM is working with a number of Faraday Partnerships to support the initiation of technology roadmapping using the T-Plan method. Faraday Partnerships are DTI funded initiatives aimed at promoting improved interactions between the UK science, engineering and technology base and industry.

There are 24 UK Faraday Partnerships, each focused on a different technology or sector. Each partnership network defines key research needs for its area of interest, with £1 million funding available from the EPSRC. Each employs a team of Technology Translators to support smaller companies and to provide technology transfer services. CTM's Faraday work has involved three applications so far: for biocatalysis, satellite navigation and food processing. In each case the primary goal is to define key research challenges, although the workshop-based approach is proving to be very beneficial for network development.



Each application has involved a one-day workshop, with between 12 and 35 participants from industry and universities.

While the T-Plan approach was originally developed for use within companies, it has proved equally useful at the sector level, stimulating knowledge sharing and collaboration.

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

CTM Symposium 2003

Accelerating innovation through technology and design

The next Cambridge Technology Management Symposium, to be held on 1 and 2 October 2003 in Downing College, will take as its theme: 'Accelerating innovation through technology and design'.

Get the date in your diary now and plan to join us at this new location and new time of year, for what should be our biggest and best Symposium yet.

We shall tackle the topical issue of how to generate new business from innovative technology and creative design.

IfM head receives CBE in New Year's honours list

Professor Mike Gregory, head of the Institute for Manufacturing, was awarded the CBE in the New Year's honours list, for services to industry and business. Mike was central in establishing the Centre for Technology Management, and he continues to play a highly supportive role in our activities.

Baby break for Geraldine

Congratulations to Geraldine Guceri, our CTM research co-ordinator who is expecting her first baby at the end of March. She will be taking maternity leave from 20 February and will rejoin us next January.

Geraldine's duties will be covered by Sian Bunnage (right). Sian's academic background is in Psychology with a particular interest in occupational and organisational psychology.

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Diary

March		
5th	*Technology Roadmapping*	Workshop Madingley Hall Cambridge
April		
9th	*Network Forum*	Fitzwilliam College Cambridge
May		
8th	*CTM members' meeting*	Churchill College Cambridge
October		
1st-2nd	*Accelerating innovation through technology and design*	CTM Symposium Cambridge