

Technology Management

Quarterly newsletter of the Centre for Technology Management (CTM)

February 2006

Big fish, little fish...

Start-ups and established firms – how can they work together?

Large and small companies work in very different ways and partnerships between them can be difficult to manage – but small start-ups and established firms have a lot to gain from working together. There are two main reasons for this:

- Early-stage, technology-based companies can be significant generators of innovation but their growth is typically constrained by lack of resources.
- Larger, established companies have extensive resources but need access to innovative ideas – sourcing them from wherever they are generated whether internally or externally.

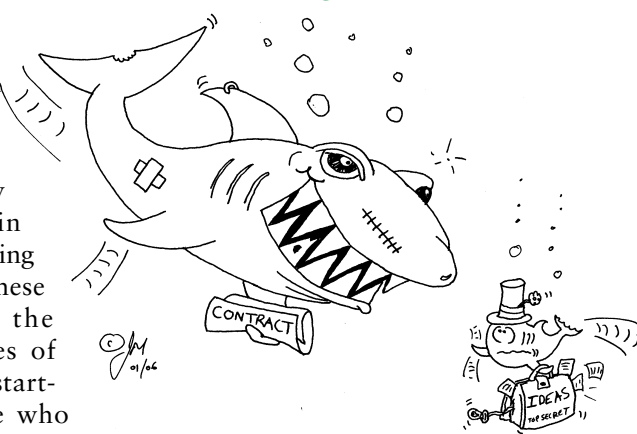
Combining the resources of a large company with the innovative culture of a smaller one offers obvious attractions. While there are clearly benefits from such partnerships, making them work can be a challenge. Collaborations often start with high hopes and (apparently) potential mutual benefit, but often end in dispute and disillusionment.

CTM researchers have recently completed a project studying how such companies can collaborate more effectively. The project sought to identify why these partnerships face problems, and what can be done to overcome them.

After reviewing existing research in this area, case studies were used to identify the key challenges in setting up and managing such partnerships. These were viewed from the different perspectives of the large firms, the start-ups firms, and those who provide support services (such as lawyers and investors). The research team was fortunate to receive very open input from the range of companies that were approached.

These case studies, coupled with the outputs of three industrial workshops, provided the basis for a series of checklists to help both sides in the partnership better understand the other, and to avoid potential pitfalls. These checklists have been brought together in a draft workbook for use by companies considering such collaborations.

The workbook includes sections such as: ‘What every big company should know about start-ups’ and ‘What every start-up should know about big companies’. The checklists start by addressing generic partnering issues. They then go on to focus on specific problems caused when one partner is young, small and with an



There can be particular problems when one partner is a young company with an untested technology and the other is large, with resources built up over many years...

untested technology, and the other is older, much larger and with a wide range of competences and resources built up over many years.

The draft workbook will now be developed further in collaboration with the IfM's Industry Links Unit. In addition to the workbook, a number of papers describing the research approach have been presented at conferences, and journal papers are currently being drafted.

For more information on this project, please contact Tim Minshall (thwm100@eng.cam.ac.uk)

Joining the B ATP research project is helping one company get to grips with some difficult technology issues

Valerie Thorn, founder and CEO of AND Technology Research, describes how she became involved in CTM's Business Appraisal of Technology Potentials (B ATP) project. The company, in Theydon Bois Essex, specialises in embedded computing technologies and provides R&D services for electronic product development and ambient computing.



The starting point for my interest in this area was a need to develop company strategy for my technology-based business. I set about researching the issues surrounding the impact of technology investment decisions and IP ownership on the long term goals of a company.

I was looking for a way to progress with my research when David Probert mentioned the Centre for Technology Management's B ATP project to me.

Complex issues

B ATP was well underway when I joined the team last September. It was clear to me that CTM is leading the way with its research into the many complex issues involved.

The opportunity to take part in this project, provide business input and gain an academic framework to support my decision making was exactly what I was looking for. Technology looms large within the strategic decision

making process of any company - whether because it helps them to gain strategic advantage, to develop or improve products or services, or indeed forms the basis of the business itself.

Long-term sustainability

Clearly the way companies choose to invest in technology depends on their goals. While some are seeking growth in revenues, assets or knowledge, for me the heart of the question is long-term sustainability of the company, with a particular focus on IP. How in this context can I assess the real worth of IP, as opposed to its simple commercial value?

concepts as 'real options' and 'value roadmapping'. Applying this work to technology appraisal is now underway. I am looking forward to a busy but fruitful few months.

Report shows Cambridge high-tech firms still lead the way...

Cambridge high-technology business cluster is continuing to grow and maintain its position as one of Europe's leading centres for technology-based entrepreneurship, according to recent research. For example, in 2004 Cambridge firms secured 25% of all UK venture capital investments and 8% of the European total by value.

The Cambridge cluster is a complex entity, with numerous private and public organisations working to support the start-up and growth of high-technology firms. A report has been produced with the aim of clarifying the activities of these organisations. The Cambridge Technopole Report was produced to give those outside Cambridge an overview of the 'Cambridge Phenomenon'. It has also proved popular with those who live and work within the cluster.

Over 2,000 paper copies of the report have been distributed since its launch in 2002, and a similar number have been downloaded from the web site. The report has proved

particularly popular with international delegations, and is frequently provided as part of the pre-visit briefing documents.

The report covers the context and history of the region before going on to list and describe a selection of the main organisations working to support the high-tech business community. These are grouped around business networks, conferences, universities and their industry-focused departments, investors, science parks, business incubators, public and private business service providers, and technology providers. It also gives links to recommended further readings on specific aspects of the Cambridge high-tech scene.

The report is available free via: www.stjohns.co.uk/documents/cambridgetechnopolereport.pdf.



The complete solution – companies seek the perfect support package...

Like many companies, BAE Systems is now offering its customers complete solutions, rather than sets of products. In the case of the Ministry of Defence, BAE System's principal customer, a complete solution means not having to concern itself with the ongoing support and upgrade of equipment.

Taking on this task represents a superb opportunity for BAE Systems, but also raises a number of questions. Not the least of which is 'what is the best way to design and cost a support solution?'

Three-year programme

The Institute for Manufacturing is helping them answer these questions with a three-year project. One year into the programme, the research is now focused on the following key strands:

- Maps, models and frameworks
- Requirements capture
- Through-life capability
- Managing the supply network
- Support information networks
- Organisation design

Through-life capability

Clive Kerr and Rob Phaal of CTM are working on the 'through-life capability' strand. The focus of the research is on how to sustain and enhance the capabilities of current defence products, given the likely changes in future military operations, the pace of change in technology and

the emphasis on life cycle cost reduction under integrated solution contracts.

Three elements are currently being explored:

- The application of roadmapping techniques for determining future capability against current and future shortfalls
- The co-ordination of technology insertion activities in a service environment
- The formulation of technology development practices to facilitate and manage the identification and development of technology for evolutionary acquisition

Requirements capture

Francis Hunt of CTM is working on the 'requirements capture' strand. The main issue here is that service requirements can be more difficult to establish than product requirements. Service designers are more reliant on customers to define the specification; customers play important roles in the service itself; many of the design criteria are intangible involving, for example, trust, empathy, emotion, feelings; and there is a wider scope of tangible factors including the service environment and the appearance of service personnel.

However there are many companies successfully providing support solution, for example in the IT or railway sectors. A first step in this strand is to understand how these companies approach the task of providing support solutions and to assess to what extent these approaches can be transferred.

Innovation and productivity – taking on the challenge

CTM is a partner in the Innovation and Productivity Grand Challenge, a three-year project with £3m of funding from the Engineering and Physical Sciences Research Council, starting in January 2006.

In collaboration with Imperial College, Liverpool, Cranfield and Loughborough universities, the research aims to explore all aspects of science/industry interaction that lead to economic return on technology developments.

The Lambert Report

The project is supported by the Advanced Institute of Management and has an Industrial Advisory Board led by Richard Lambert – author of the Lambert report on technology transfer from universities to industry. It aims to provide fresh insights into the knowledge-to-innovation question, especially in the shifting context of innovation in advanced economies.

The CTM contribution will be led by Elizabeth Garnsey, Tim Minshall and David Probert, with projects addressing high tech firm growth, university spin-outs, the role of technical consultancies and the generation of breakthrough innovation in established firms.

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

Conference report

Presentations by CTM researchers in 2005

R&D Management Conference Pisa, Italy

- Developing software content for manufactured products: inside or outside the firm? (David Probert)
- Using the theory of constraints, the KAI inventory and a climate measure, for a creativity audit: A case study at a commercial R&D organisation (Nicos Raftis)
- Valuing technology in R & D – communication and visualisation (Emre Kazancioglu)
- Roadmapping biofuel as a contribution to the sustainable economy: developing a practical

foresight approach (Nares Damrongchai)

- Integrating supply chains with technology roadmapping (David Beeton)
- Them and us – asymmetric dyads involving early-stage technology firms (Pete Fraser)

PICMET Conference Portland, USA

- Ten years of technology management research at Cambridge: what has been done and what does the future hold? (David Probert)
- Developing a technology roadmapping system (Robert Phaal)

- Software sourcing results from a questionnaire survey (Francis Hunt)
- An interdisciplinary perspective on business appraisals for technology potentials (Marcel Dissel)
- Resource-based view of partnerships between technology-based start-ups and established firms: A case study of Cambridge Display Technology

IEEE Conference Newfoundland, Canada

- Evaluating early stage technology valuation methods; what is available and what really matters (Marcel Dissel)

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

Diary

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

Feb

21 *Technology intelligence* Half-day workshop
Cambridge

Mar

9 *Strategic roadmapping* One-day course
Hilton Hotel, Paddington
London

28-30 *Technology and innovation management* Three-day executive training
course, Jesus College,
Cambridge