Software tool helps value new technologies

R&D departments are frequently forced to choose between promising new technologies – but deciding which is most likely to yield future profits can be hard. A simple-to-use software programme has been designed at CTM to meet this need, using decision trees to model projects.

The software is extremely user friendly, using only five buttons to provide all the functionality required. It can be used for individual projects as well as complete project portfolios. The decision tree format provides a visual description of a project, helping to promote transparency. The programme uses Monte Carlo simulations to model uncertainty – and inevitable aspect of early stage technologies. The software has a built-in sensitivity analysis package to determine the critical nodes in a project.

CTM is now looking for companies who would like to test the tool. Contact Dr Francis Hunt (fhh10@eng.cam.ac.uk) to have a fully facilitated trial.

CTM's technology management course proves a hit with companies

CTM provides a week of technology and innovation management education for the Cranfield MSc course, set up in collaboration with Rolls-Royce. Increasingly other companies are taking part, and this year we also had participants from AWE, BAE Systems and BOC.

A highlight this year was the case study work around the introduction of inertia welding. Throughout the week participants worked in teams to review the lessons from nearly 40 years of development of this novel manufacturing technology and to consider how to capture lessons learned for future benefit.

The teams were supported by visiting experts who helped them to draw up technology roadmaps to communicate the key issues. The final presentations were particularly good, of value to course participants, experts working on the current issues and teaching staff alike.

Institute for Manufacturing plans new building

Development plans are well under way for a new location and building for the IfM. Our current premises in the centre of Cambridge may be quirky – but they are hardly purpose-built for our growing variety of activities.

The site was formerly the home of the university printing presses and before that was a brewery. The buildings are now seriously constricting our ability to carry out our programmes of teaching, research and industrial services.

The new building will accommodate all our staff, including current off-site laboratories, and will provide state-of-the art facilities and much easier access for visitors. A space on the university's fast developing West Cambridge site has been allocated, and funding is currently being sought.

David Probert, Head of CTM, leads a session during the recent technology management course at Cranfield.

Engineering students display their design skills

Manufacturing Engineering students at the Institute for Manufacturing held their 2006 Design Show, displaying a range of new products that they have developed as part of their course.

The Design Show is held each year for an invited audience of local industrialists and designers. Students put together displays to explain the technical and business ideas behind the products, together with design details and prototype models of the products themselves.

This year's projects included an innovative mobile accident screen to discourage 'rubbernecking' by passing motorists and a glove that uses ultrasound to help the partially sighted 'sense' their surroundings.

"The students have been working on their projects for most of the past year and the results are fantastic," said Lecturer Dr James Moultrie. "Some ideas have real commercial potential and they will be seeking finance to take them further. These projects demonstrate how important it is for engineers to develop their design skills."

The projects

Ten teams of four students each spent many months researching the market, designing and testing their product and preparing a business plan. Four of the projects this year were:

Touchsight: helping the visually impaired 'sense' their surroundings

Products with electronic sensing systems for the blind do exist but very few have achieved widespread popular appeal and most are instantly noticeable and potentially stigmatise the user. The students came up with a revolutionary glove-based system, which combines ultra-sound with sensory feedback.

The glove uses ultra-sound to detect the environment, similar to a bat. It includes a small vibrator that turns this signal into a physical sensation that the wearer can feel. The nearer you are to an object, the stronger the feedback. Trials with blind users have resulted in extremely positive feedback and a demand for the product to be taken all the way to market.

Axi-Shield: the accident screen that puts a stop to rubbernecking

Axi-Shield is a versatile mobile accident screen capable of fast and safe deployment on major roads, to reduce the likelihood of secondary accidents caused by 'rubbernecking'. The students behind it say it could be deployed from a standard transit van in under five minutes to provide rapid protection around an accident scene. Rubbernecking costs an estimated £27 million annually in the UK, through time lost and through further accidents resulting in secondary fatalities.

Snowshell: intelligent snowboard protection

The Snowshell arm guard has been designed from first principles, based around a thorough understanding of how the arm

behaves during a fall. There are an estimated 450,000 serious injuries globally as a result of snowboarding accidents. Over 45% of these are injuries to the arms. The Snowshell arm guard is a carefully engineered solution that prevents the arm 'locking-out' during a fall, as well as providing wrist support and impact protection.

MyMax: 3D movies from a standard projector

There are a growing number of movies being produced in 3D formats, but which can only be watched using expensive high-tech equipment.

The MyMax system is an optical device which, when added to the front of a standard projector, enables these films to be viewed in all their 3D glory. This simple solution makes 3D cinema in the home a reality.

Software collaborations – avoiding the pitfalls…

Some potential pitfalls of software collaborations were highlighted at a workshop on software sourcing for products organised by CTM in July.

Tim Mulcahy and Paul Burton from AVEVA Group attended a similar workshop a year ago, just before setting up a dedicated development centre in India. They came back to report on how things had progressed and highlighted a number of key points they had learnt along the way.

Recruitment was just one of the areas that threw up some surprises. The plentiful supply of software engineers in India had led them to think finding staff would be much quicker than in the UK. In fact the process took just as long. Communication, attitudes and training were some of the other areas with potential pitfalls.

Delegates also learned from the experiences of Valerie Thorn, MD of AND Technology Research for 25 years, a company that develops electronics and software-based products. She emphasised that customers cannot just offload their problems onto the software provider. Both companies need to work together to ensure a successful collaboration.

Francis Hunt from CTM described the outputs from a research project on sourcing software development. Checklists from the project are available at: www.ifm.eng.cam.ac.uk/ctm/software_sourcing/ProjectOutputs.html

Roadmaps – a valuable source of technology intelligence

CTM has collected details of hundreds of public-domain roadmap documents from an extensive internet search. The roadmaps cover many areas and provide a useful way to gather technology and industry intelligence.

The list can be downloaded from the CTM web site (www.ifm.eng.cam.ac.uk/ctm/trm/resources.html). The roadmaps are being used to support ongoing research, currently focusing on the structure of graphical roadmaps.

Microsoft roadmap computational science

Interest in roadmapping continues to grow, both at company and sector levels and CTM has undertaken several recent roadmapping collaborations. The future of computational science has been explored with Microsoft who published the roadmap in March, aligned with a special edition of Nature magazine.

Throughout 2006 CTM is working with the DTI and NPL to identify metrology research priorities for the UK.

PICMET report – premier event for technology management community takes place in Turkey

PICMET is one of the largest conferences in the field of technology management with more that 350 industrial, academic and government participants from around the world.

CTM was well represented at this year's event, held in July in Istanbul. David Probert presented on Value Roadmapping, Charles Romito on investment decision-making, Ayuth Jirachaipravit on broadband regulation and Andre Leme Fleury on technology roadmapping in software companies.

CTM also organised a half-day workshop on Technology Roadmapping that was attended by both practitioners and academics from several countries, including Turkey, Iran and Japan.

Keynotes of notable interest were delivered by Se Ho Cheong (Samsung), Edward Roberts (MIT) and Cengiz Ultav (Vestel Electronics).

Se Ho Cheong outlined Samsung's R&D management practices which involved integrating multiple technology management frameworks including technology roadmapping, TRIZ and 6-sigma. Edward Roberts drew on almost 40 years of research in technology-led spin-outs from MIT to highlight the pressing concerns in hi-tech entrepreneurship. Mr Ultav described the strategy Vestel had adopted to gain a consumer electronics market share of more than 25 per cent in the EU. High product variety compared to competitors from the Far East was the key.

CTM has also worked with the DTI to investigate how the collection of public-domain roadmaps can be used to search for potential civil applications for defence technology. CTM is also collaborating with the University of Surrey to develop a roadmap for the EPSRC Ceramics Network.

Roadmapping courses

A range of activities support dissemination of CTM's roadmapping expertise and knowledge developed over the past eight years. The most recent public course was held in Cambridge in June, with the next scheduled for 18 October. CTM is collaborating with several organisations in Japan, where interest in the technique is growing, and Rob Phaal recently provided two days of training for the Hong Kong Polytechnic University.

Specialised training and support

In May, seminars were delivered at Butler and Purdue Universities in Indiana, followed by a keynote presentation at the annual Cutter Consortium summit in Boston. Of growing interest is the provision of specialised training and support in companies, where the content from the public courses is customised to suit the particular needs of the firm.

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 enjoys a guided tour of Cambridge

Every year, when exams are over and students have left, CTM organises a short summer celebration. Past highs and lows have included punting trips with picnics on the river bank, or picnics in the office when it wouldn't stop raining.

This year we took a busman's holiday and went on a guided tour of Cambridge, followed by food, drink and punting from Darwin Island on the Cam.

The tour was a real highlight – arranged with the local tourist office, and much recommended for locals and visitors alike.

Our guide was a formidable retired history teacher who certainly got everyone's attention, while imparting all manner of fascinating information.

BMW, Virgin Atlantic, Motorola, France Telecom and the Design Council to speak at Symposium

This year's CTM Symposium focuses on creativity, design and innovation. We have some leading exponents in the field as key note speakers including: Sir George Cox from the Design Council, Joe Ferry from Virgin Atlantic, Gert Hildebrand who led the Mini design at BMW, Andrew Till of Motorola and Clive Grinyer of France Telecom. Professor John Bessant will provide a view of how to manage discontinuous innovation, from his perspective as foremost UK academic in the field. It promises to be one of our most stimulating symposiums to date and early booking is recommended. See: www.ifm.eng.cam.ac.uk/ctm/symposium.

CTM and guide on the tour round Cambridge

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

Sept		
21-22	*Create, design, innovate: Enhancing business performance*	Technology Management Symposium Downing College, Cambridge
Oct		
18	*Strategic roadmapping*	One-day workshop New Hall, Cambridge
Nov		
1	*Creativity*	One-day workshop Fitzwilliam College, Cambridge
16	*Make-or-buy*	One-day workshop Fitzwilliam College, Cambridge