The fuzzy front end of product design…

Product design and development are too often treated as purely engineering activities rather than key business processes. As a result, many companies rush into the implementation phase without sufficient exploration of vital, front-end issues. This may mean that customer and user requirements are not well understood, and that approaches to product platform strategy and design for manufacture are poor.

These issues were the focus of a recent two-day course entitled *Better product design: practical tools for navigating the fuzzy front end*, organised by CTM as part of the Good Design Practice programme.

The term 'fuzzy front end' was coined by Don Reinertsen to describe the time between when a project *could* have started and the time when it actually does.

This period represents an opportunity to perform valuable pre-development activities, but all too often such activities are unfocused and given low priority.

The course provided a fun and thought-provoking review of the general principles of product design and development, with an

emphasis on practical tools and a hands-on approach.

Participants first performed a design capability audit for their own companies. They then took part in a series of team exercises following a hypothetical product through the fuzzy front end.

Teams were given a product range and were briefed on the characteristics of the market for their products. The objective then was to come up with a number of product proposals, developed using some simple tools and techniques.

Topics covered included market segmentation, understanding user needs, feature definition, product architecture, product platforms, concept generation and selection and the use of prototyping.

The need for some structure in the fuzzy front end was explored and teams were required to develop a simple 'process on a page' to control these activities.

The course content draws from material developed for the set of Better Product Design workbooks, which includes a design capability audit, a guide to effective product design and a handbook of tools and techniques.

A website has also been set up to provide further support for product design and development:
www.betterproductdesign.net

The course is expected to run again early in the New Year. For further details contact Pete Fraser, pvf20@eng.cam.ac.uk.

Innovation – it's still what it's all about…

Innovate! Innovate! Innovate! This was the key message from the IEEE International Engineering Management Conference, held at St John's College, Cambridge.

The event, attended by well over 200 delegates from around the world, saw an array of papers ranging from technology strategy to cultural issues within an organisation.

Innovation has been the focus of management attention and research for some time but, as the

The world has witnessed continuous innovation for the last 200 years

conference demonstrated, it doesn't appear to have a sell-by date.

There were many illustrations of this from high profile leaders in industry.

Chairman of QinetiQ, Sir John Chisholm, gave a graphic description of how the world has witnessed a continuous stream of innovation in the last 200 years.

Man has always been inventive, but the failure to

codify and transmit these inventions to future generations has inhibited past civilisations from remaining dominant – the Romans are an example. The phenomenal technological progress enjoyed today is a result of our ability to generate, accumulate and

Civilisations need to codify their inventions for future generations

deploy knowledge by systematic means.

Innovation doesn't always have to involve creating new things, Sir John explained. One of his company's routes to innovation involves finding new applications for existing technologies - the exploitation of guided missile technology in oil exploration, for example.

Creative people are key to producing successful technologies. Dr Lewis Terman of IBM made it abundantly clear that companies must focus their efforts on stimulating, recognising and rewarding the creativity of the workforce. This is perhaps why IBM has produced two Nobel Prize winners, not to mention topping the charts

in the US patents league for the last decade.

Of course, size doesn't always matter when it comes to succeeding at innovation. As Sir Robin Saxby of ARM would agree, the key is having the right people doing the right things at the right time. Starting with only 12 engineers, ARM is now leading the world in semiconductor design with its technology used in most mobile phones and many embedded systems.

One of the reasons for its success lies in its innovative partnership model, where

The key is having the right people doing the right things at the right time

all stakeholders work together to ensure mutual success.

CTM, as conference co-organiser, was well represented, with presentations covering a broad range of issues - roadmapping UK's road transportation technology, sourcing embedded software, sustaining product innovation and assessing product development capability.

…as long as you do it strategically

New researchers join CTM

Strategic Innovation was the theme of an academic-industrial network meeting at the University of Bath in early October, attended by 28 people from a wide range of organisations.

Professor John Bessant from CENTRIM in Brighton gave a broad overview of the key elements of the innovation process and the challenges of radical change.

This was followed by Alistair Atkinson, Business Innovation and Transformation Business Consultant at Hewlett Packard who gave a fascinating insight into IT supported collaboration for innovation.

Double the time spent on design

HP outsource 80 per cent of their manufacturing and collaborate on 60 per cent of their design activities. The new system has allowed them to double the time design engineers spend on actual design and has highlighted the role of partner relationship managers.

Professor Andrew Graves gave an overview of the past and present activities of the Innovative Manufacturing Research Centre at Bath, which was followed by an interesting discussion on managing radical innovation.

Get involved with promoting technology transfer

Finally, Robin Daniels of the Centre for Scientific Enterprise, talked about a new programme to promote technology transfer and entrepreneurship, for which the Centre has recently secured funding. They are looking for interested parties to help shape the programme's development.

The day was hosted and organised by Professor Steve Brown, Director of the Centre for Technology and Innovation Management (CENTAIM) at the University of Bath School of Management.

Tim Minshall has joined CTM where he will research new technology ventures from the point of view of both business model development and partnership and alliance formation. His industry focus will be industrial inkjet printing, handheld computers and geographic information systems. Tim is a University Lecturer in Technology Management. He will also continue a Gatsby-supported research project comparing the different ways in which countries support new technology venture creation and growth.

Subashini Paramanathan (Suba), has joined us from Malaysia, where she completed her undergraduate degree in Electrical and Electronic Engineering. After graduating, she was employed with ExxonMobil Exploration and Production Malaysia Inc. in the Reservoir Engineering Division. She is in Cambridge to do an MPhil degree, researching industrial sustainability, particularly in relation to the oil and gas Industry.

Jim Omartian is from the United States and will be spending a year with us working for an MPhil degree. Jim did his first degree at Harvard in Computer Science.

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

New Consortium focuses on nano and biotechnologies

The business impact of key emerging technologies, particularly nanotechnology and biotechnology, was the focus of an event in Zurich in September. This was the inaugural meeting of an open Consortium called GATIC (Global Advanced Technologies Innovation Consortium).

The meeting, attended by about 60 participants from three continents, comprised two parts. The main event was an extended workshop to scope the areas of nanotechnology, biotechnology and sensors, together with ways to assess

the impact of such technologies on industry and business in the future. Interesting presentations were given on both technology and business process aspects of these exciting but challenging areas.

The workshop was followed by a seminar on technology roadmapping, seen as a key approach for supporting the aims of the Consortium. This included presentations from

leading practitioners representing a range of sectors, together with two parallel, hands-on sessions lead by Richard Albright (ex Lucent Technologies) and Rob Phaal (CTM).

The Consortium was organised jointly by Professors Hugo Tschirky (ETH, Zurich), Mike Radnor (Northwestern University, USA) and Akio Kameoka (JAIST, Japan). Its aim is to encourage as broad a membership as possible, emphasising the global nature of the issues being addressed. To find out more see the new GATIC website: www.tim.ethz.ch/gatic/ which includes the outputs from the workshop.

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Diary

November

11th	*Easing the transition from design to manufacture*	Evening Workshop Cambridge
(The above workshop will be repeated on 18th November in Peterborough)		
20th	*Topic to be confirmed*	NPI Club Cambridge

December

2nd	*Collaborative product development*	Evening Workshop Cambridge
(The above workshop will be repeated on 9th December in Peterborough)		
3rd	*Technology Management - getting value from technology*	Afternoon Workshop Cambridge
4th	*Better Product Design*	Seminar Cambridge