

Technology Management

The newsletter of the Centre for Technology Management (CTM)

November 2016

Welcome to the new Head of CTM, Dr Tim Minshall

A message from David Probert

After 18 years as Head of the Centre for Technology Management, I am delighted to report that my colleague Dr Tim Minshall has taken over this role from 1st October.

Tim rejoined the IfM in 2002, having previously studied for his PhD here, carried out post-doctoral research, worked in the St John's Innovation Centre, and in industry here and abroad - see www.ifm.eng.cam.ac.uk/people/thwm100.

During his time in CTM, Tim has built up the Technology Enterprise Group, and greatly extended the scope and quality of our research and teaching.

It is with great confidence in the future of our Centre that I hand over its stewardship to Tim. We have a great team of academic staff, researchers, students and collaborators, and together with Tim they will take our work forward into new areas.

Meanwhile for my final academic year before retirement, I shall be working part-time in CTM and in full support of the new regime!



STIM 2017 launch

The Strategic Technology & Innovation Management (STIM) programme is an applied research and networking collaboration between CTM and industry. STIM is an annual programme, with the research portfolio refreshed each year. The **2017 launch meeting** is scheduled for **17 November**, providing an opportunity to shape the programme for next year, and is open to new companies with a potential interest in participating.

The STIM programme started in 2013 and has steadily grown since then, from 11 to 16 participating companies from a wide variety of sectors, and from a portfolio of 7 to 18 research projects. A series of three two-day meetings are organised through the year, hosted in Cambridge and participating company sites, together with research engagement days. These interactive events provide opportunities to catch up on research progress, interact with specific projects of interest, to discuss topics of current interest in a member-focused forum and to meet peers in other companies and sectors informally to compare experience.

Details of the 2016 STIM programme can be found on the IfM website. Examples of research projects include:

- Visualising portfolios



- Roadmapping – embedding the process
- A serious game for IP and decision-makers
- Mapping sustainable value for new technology opportunities
- Business-aligned technology strategy
- The value of 'time' in R&D projects
- The development of business models to anticipate disruption

For more information about STIM, or if you are interested in attending the launch meeting, please contact:

Dr Rob Phaal
rp108@cam.ac.uk
+44 (0)1223 765824

Alternatively, visit the STIM website:
www.ifm.eng.cam.ac.uk/research/ctm/stim

Innovations in portfolio management

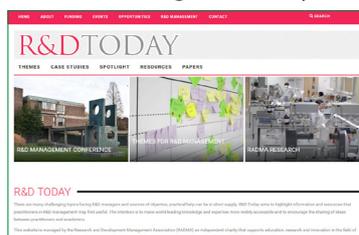
Portfolio management is a core topic in technology and innovation management, for both industry and academics, and has been an ongoing area of research interest for CTM. Despite more than half a century of practice and research in this area, there is still a proliferation of frameworks and methods published, leaving managers uncertain about what methods to use and what constitutes good practice.

Examination of the well-known '2x2' portfolio matrix class of tools (sometimes called 'bubble charts') reveals that 60% of specimens collected collapse to one primary form: Opportunity vs Feasibility. As part of the STIM programme, this approach has been elaborated, including consideration of incremental and radical innovations involving early stage technology. A novel approach to treating the uncertainties inherent in such innovation management has been established, and work is continuing to explore how to effectively visualise portfolios, tackle issues such as portfolio balance, dependences and trade-offs, and the broader context of product portfolio management systems.

To learn more contact **Dr Rob Phaal** rp108@cam.ac.uk.

New website for practical R&D issues

There are many challenging topics facing R&D managers and sources of objective, practical help can be in short supply. **R&D Today** aims to highlight information and resources that practitioners in R&D management may find useful. The intention is to make world-leading knowledge and expertise more widely accessible and to encourage the sharing of ideas between practitioners and academics.



This website is managed by the Research and Development Management Association (RADMA), an independent charity that supports education, research and innovation in the field of R&D management.

Key themes are each co-edited by two guest editors, a practitioner and an academic. Other content includes tools, case studies, practical guides and top rated papers. CTM is an active supporter of RADMA and is contributing to the launch of the new website. As this is a new enterprise we would warmly welcome your suggestions for content to include or improvements - so do get in contact.

Innovation and IP Management group update

Our Innovation and IP Management (IIPM) research group has recently grown to a team of seven. We welcome **Leonidas Aristodemou**, formerly with Procter & Gamble and MET alumni, who will be working on patent informatics for better strategic decision making on an EPSRC DTP grant. We now run projects on IP strategy (**Mingjin Guo**), IP roadmapping (**Tianyi Wang**) and IP management in collaboration projects (**Dr Ghita Dragsdahl Lauritzen**). A number of visitors joined and supported the group over the last year with projects on appropriation strategies (**Jan-Niklas Foegel**), IP in university-industry collaborations

(**Oliver Gretsch**), IP challenges in additive manufacturing (**Bernhard Hilgert**), the impact of sharing behaviour and ownership on collaborative user innovation (**Tom Oberquelle, Thorsten Pieper**) and the use of design rights as innovation indicator (**Pia Wolf**). Our international research partners include colleagues from TU Munich, RWTH Aachen, Chalmers University of Technology, Hamburg University of Technology, Kiel University, University of Münster and TU Darmstadt. We recently concluded two successful industry projects with Oxford Instruments on IP valuation tools and Swisscom on open source IP.

During the summer, Mingjin conducted interviews with firms in Silicon Valley (USA), supported by the School of Technology fieldwork grant. Two UROP students (**Lawrance Chiang, Ivan Poryazov**) worked with us on the multi-partner collaboration project and the development of an IP management teaching game, a STIM consortium project. The IP game is currently in a prototyping stage with the aim to deploy it in our teaching and executive education from next year. Please get in touch if you would like to test run the game in your company.

Our IP interest group (IPIG) now counts 19 members from 13 companies, amongst them large manufacturing firms including Caterpillar, Airbus, Siemens and GSK, but also highly innovative small firms, such as IDEX.

For more information on the IIPM group or to join IPIG please contact **Dr Frank Tietze** frank.tietze@eng.cam.ac.uk.

IP Management teaching workshop



The IfM ran an IP management teaching workshop on 20 September, jointly organized with **Marcus Holgersson** (Chalmers University of Technology, Sweden), supported by the European Institute for Technology and Innovation Management (EITIM) and funded by the European Patent Office (EPO) and UKIPO. The aim was to share best practice experience of teaching IP management to a non-lawyer audience. Leading IP management academics or practitioners from large manufacturing institutions regularly running in-house IP training courses joined us from around the world. Yann Ménière, EPO chief economist, gave a talk on IP trends and related challenges.



4th Strategic IP Forum, Thursday 1 December

"Small meets large – IP challenges": the fourth Strategic IP Forum (SIPF), kindly supported by AvidityIP, will take place on Thursday 1 December at the IfM. Speakers include Jo Costura (Licensing Manager, Caterpillar), Donal O'Connell (former Director of Intellectual Property Rights, Nokia), Michael Evans (CEO, Cambridge Carbon Capture) and John Nevard (Director Intellectual Property, Cambridge Display Technology).

Information & booking: bit.ly/SIPFdec

CTM/ECS Collaboration

CTM and IfM Education and Consultancy Services (IfM ECS) – the dissemination arm of the Institute for Manufacturing – continue to work together closely to transfer CTM knowledge to industry and government.

Key research into strategic and technology roadmapping, portfolio selection and management, make or buy, open innovation, technology intelligence, and visualisation are translated into practical approaches and toolkits as well as education modules, for application in consultancy and executive and professional development.

One of the ways by which CTM and IfM ECS facilitate knowledge transfer is through interest groups, which meet regularly to discuss latest research and practice in key knowledge areas. Two interest groups are currently active – the Roadmapping Interest group, facilitated by **Dr Imoh Ilevbare** and **Dr Rob Phaal**, and the Portfolio and Selection Interest group facilitated by **Dr Michèle Routely**.

Discussions at these meetings (which are open to all IfM researchers and Industrial Fellows) catalyse research advancement and improvement of practice, and promote closer collaboration between researchers and industrial fellows.

Our researchers and industrial fellows also collaborate to develop new and customised solutions for industry and government clients. These include the open innovation solution developed for a leading oil-servicing multinational by **Mr John Saiz** (a Senior Industrial Fellow and ex-NASA CTO) and **Dr Letizia Mortara** (Senior Research Associate and specialist in Open Innovation). Another is the Innovation and Technology Management (ITM) Assessment, used to examine companies' ITM systems and capabilities, and identify issues requiring improvement.

Other projects are using CTM research in innovative ways, such as the application of our innovation risk management knowledge for a government-sponsored programme to help 36 businesses de-risk their innovation processes, and the application of T-Plan roadmapping

to support the development of technology strategy at a leading UK-based manufacturer listed on the FTSE 250.

In addition to this, CTM was again involved in another successful delivery of the Atos' Gold for Experts executive development programme (run and managed by IfM ECS). Leading Atos managers were led through innovation and technology management principles and practical approaches from our latest research.

Invitation to participate in university-industry collaboration study

In this study success mechanisms and IP policy of university-industry collaboration research projects are evaluated from both sides.

Benefit: Study participants will receive an individual benchmarking report which will compare their organization regarding the conduction/performance of joint research projects with top performers.

Website for study registration: www.uni-industry-collaboration.org

Oliver Gretsch, PhD student with **Professor Dr Alexander Kock**, currently visiting CTM and working with **Dr Frank Tietze** in the field of IP policy, conducts this study.

Feel free to contact Oliver at any time to receive more details: og267@cam.ac.uk

Simon Ford pursues Canadian professorship

Simon Ford has left IfM for the 2016-17 academic year to work in Vancouver, Canada at Simon Fraser University (SFU) with IfM alumni

Sarah Lubik. While at SFU, Simon is a Visiting Associate Professor at the Beedie School of Business, and will be teaching courses on Foundations of Innovation, Managing Emerging Opportunities, and Introduction to Entrepreneurship and Innovation.

He is also a Beedie Family Visiting Fellow, which will see him continue his 3D printing research in the areas of education, sustainability and advanced materials commercialisation, as well as

serious games development. If you're in the area, drop him a line and he'll help you find the best coffee shops and craft breweries.

We welcome...

Pia Wolf, who has joined the Centre for Technology Management as a visiting student from Technical University of Munich in Germany until February 2017. She is supporting Frank Tietze by conducting research on whether aesthetic innovation in design can be measured by using Registered Designs as indicator.



Pia is a graduate student majoring in Innovation and Technology Management and Informatics at Technical University of Munich. Her research interests include design, IP and their link to innovation.

Oliver Gretsch joined CTM, and in particular the Innovation and IP Management Group (IIPM), as an academic visitor. He is working with Frank Tietze until the end of November. Oliver's research focuses on university-industry collaboration project performance.



The purpose of his studies is to gain a better understanding about effective management activities and performance measurements in joint research projects of universities and companies.

Oliver has a Master's degree in Corporate Management & Economics from Zeppelin University. He works as PhD student and research associate in the field of technology and innovation management at the Technical University of Darmstadt together with Professor Dr Alexander Kock.

Technology management research at Cambridge

- Strategic technology management
- R&D project selection
- Software sourcing in manufacturing
- Enhancing creativity in new product development
- New product introduction collaboration
- Technology management: a process approach
- Technology selection
- Technology evolution in hi-tech firms
- Innovation management in hi-tech firms
- Emergence of technology based industry
- Technology scanning and intelligence
- Technology acquisition
- Intellectual property management
- Strategic make-or-buy
- Industrial make-or-buy decisions
- Sustainability and technology insertion
- Technology valuation
- Technology foresight

New publications

Cetindamar, D., Phaal, R. and Probert, D., (2015), 'Technology management as a profession and the challenges ahead', *Journal of Engineering and Technology Management*, 41, pp. 1-13.

Foege, J.N., Lauritzen, G.D., Tietze, F. and Salge, T.-O. (2016). What is mine is yours, or is it? Exploring solvers' value appropriation strategies in crowdsourcing contests. R&D Management Conference. Cambridge, UK (under preparation for the Research Policy).

Granstrand, O. and Tietze, F. (2016). IP strategies for evergreening of sequential innovations. R&D Management Conference. Cambridge, UK (under preparation for the R&D Management).

Hirose, Y. and Phaal, R., (2016), 'A retrospective visual mapping approach for understanding the emergence of technology ventures', R&D Management Conference, Cambridge, 3-6 June.

Jeong, Y., Lee, K., Yoon, B. and Phaal, R., (2015), 'Development of a patent roadmap through the generative topographic mapping and bass diffusion model', *Journal of Engineering and Technology Management*, 38, Oct-Dec, pp. 53-70.

Kerr, C., Phaal, R. and Thams, K., (2016), 'Customising and deploying roadmapping in an organisation setting: the LEGO Group experience', R&D Management Conference, Cambridge, 3-6 June.

Lauritzen, G. D. & S. Salomo, (2016), 'Exploring the dynamics of firm and innovation community collaboration: A complex love story', book chapter in Brem, A. & E. Viardot (Eds), *Revolution of Innovation Management: The Digital Breakthrough*, Vol. 1, Palgrave MacMillan. <http://www.palgrave.com/la/book/9781137574749>

Pieper, T., Tietze, F., Schultz, C. and Herstatt, C. (2016). To share or not to share – Exploring the impact of sharing behavior on user innovativeness R&D Management Conference. Cambridge, UK (under preparation for the Technovation).

Yip MH, Juhola, T., (2015), 'Stakeholder involvement in software system development – insights into the influence of product-service ratio', *Technology in Society* (2015), 43, 105-114.

Yip, H.H., Ilevbare, I.M., Phaal, R. and Probert, D., (2016), 'Translating technology management research into practice: system design characterization as an example', *Proceedings of the Portland International Conference on Management of Engineering and Technology (PICMET)*, Portland, Honolulu, Hawaii, 4-8 September.

Zhao, B. and Phaal, R., (2016), 'An evidence-based approach for entrepreneurs to assess technology ventures', R&D Management Conference, Cambridge, 3-6 June.

Diary 2016/17 www.ifm.eng.cam.ac.uk/events

November		
8	<i>Visual Approaches for Strategy and Innovation Management Seminar</i>	One-day course IfM, Cambridge
23	<i>Open Innovation Forum Food & FMCG Pitching Event</i>	Event Food Matters Live, London
December		
1	<i>Strategic Intellectual Property Forum</i>	Open event fM, Cambridge

Contact us

Centre for Technology Management
Institute for Manufacturing
Department of Engineering
17 Charles Babbage Road
Cambridge, CB3 0FS UK

Tel: +44 (0)1223 766141
Fax: +44 (0)1223 464217
ctm-enquiries@eng.cam.ac.uk
www.ifm.eng.cam.ac.uk/ctm