

Technology Management

The newsletter of the Centre for Technology Management (CTM)

July 2014

Visualising portfolios is brought into sharper focus

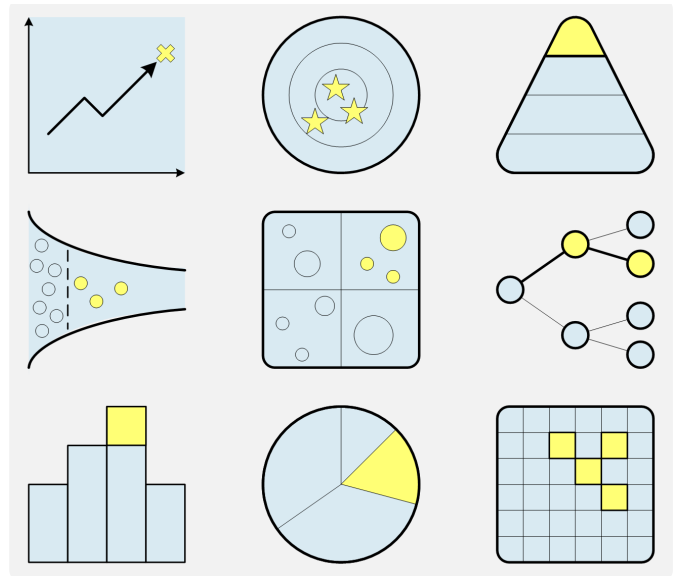
CTM has been building a capability in the area of visualisation to provide support to managers for both decision-making and communication purposes. Led by **Dr Clive Kerr**, the area has grown from the initial work on visual design guidance for roadmapping and has since evolved into 'Visual Approaches for Strategy and Innovation Management'. The latest work is focused on visualising portfolios.

Portfolios are a fundamental tool for managers and their visual depiction is a common challenge for companies who need to convey insights and recommendations rather than reporting data for review. It requires appropriate and meaningful visual representations which attempt to balance data provision with the needs of specific stakeholders in terms of purpose and comprehension. Clive currently has a research project within the STIM Consortium exploring how to visually present different aspects of portfolio management including:

- Portfolio and pipeline views
- Selecting versus balancing
- Phases, stage gates and filters
- Pain points and constraints

There has been a recent surge of interest from industry in the visualisation of portfolios – especially for critiques of company examples, template development and follow-on design advice. Of particular concern is the issue of conveying large amounts of complex information to senior managers.

A design process for prototyping visual concepts and enacting representations is now available as a facilitated consultancy service. The challenges are to articulate a clear and meaningful narrative, develop the most appropriate format and employ key design principles to ensure that the viewer can quickly grasp the key messages and follow the



flow of information through the graphic.

Recent case studies and industrial engagements have included:

- How to visually depict a portfolio of technology projects for budgetary review
- How to compare and contrast projects across different development areas
- How to express opportunities for internal alignment and external exploitation
- How to support the recognition of resourcing issues against project schedules and level of progress

This is a growing area of work for CTM, so enquiries are always welcome. For more information please contact Clive Kerr (civk2@cam.ac.uk).

Stop press: New University Lecturer in Technology and Innovation Management

Welcome to **Dr Frank Tietze**, who will be joining us in September in this new appointment, coming from the Institute for Innovation Research at Kiel University.

CTM teaching and research activity has grown steadily in recent years, and despite active involvement of all Centre

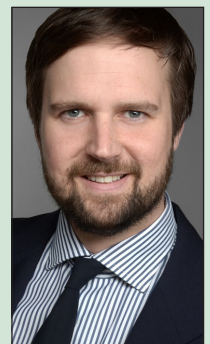
staff, there are still many opportunities we are unable to fully exploit for capacity reasons.

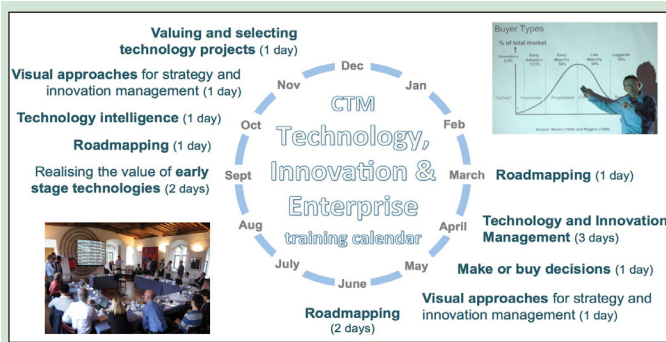
This recently-approved new vacancy drew an excellent response from around the world, resulting in a shortlist of six very strong candidates.

As a previous visitor to CTM,

we are delighted that Frank and his family will soon be moving to Cambridge, and look forward to working together to build the future of the Centre.

There will be a profile of Frank's background and research interests in the next edition.





Flagship course over-subscribed as dissemination grows stronger

Dissemination and transfer of research and practice and been a growing area of activity for CTM over the years.

An annual programme of executive education courses runs through the year, ranging from broad coverage of technology and innovation management as a whole, to specialised topics.

The flagship Technology and Innovation Management course is held in spring each year at Jesus College in Cambridge, comprising three days of presentations, interactive sessions and discussions.

The course this year was over-subscribed again, with more than 20 participants attending from a range of industries and countries.

The annual programme of events has evolved as the research activities of CTM have grown and expanded. The most recent additions are courses on 'Visual approaches for strategy and innovation management', delivered by Dr Clive Kerr.

In addition to public courses held in Cambridge, similar courses are frequently run in-company, customised to suit the particular firm and industry context.

Contact: Dr Rob Phaal



Learning experience at RADMA

CTM was well represented at the R&D Management Association (RADMA) Conference in June in Stuttgart by **Joonmo Ahn** (right), **Ahmed Mashhour** (left) and **Rob Phaal**.

Two research papers were presented, summarised below, and a workshop on 'roadmapping the future of roadmapping' facilitated.

The host, Fraunhofer IAO, did a great job, with more than 200 international academic and industrial participants. A great learning experience for CTM, with the conference to be hosted in Cambridge in 2016.

Ahmed presented his paper, co-authored with Rob Phaal and David Probert, entitled *Characterizing the acquisition of complex systems – the case of the mission critical communications industry (MCCI)*.

Novel depictions of the different strategic configuration options (SCO) for acquiring technology solutions in the MCCI have been developed, and factors that influence the selection of particular SCOs explored.

Joonmo presented his paper, co-authored with Letizia Mortara and Tim Minshall, entitled *Longitudinal effects of open R&D strategy on firm performance: comparative study of the UK and Korea*.

This paper addresses the question: "Can open innovation enhance firm performance over time?" and explores similarities and differences of open innovation trends with UK and Korean panel data sets.

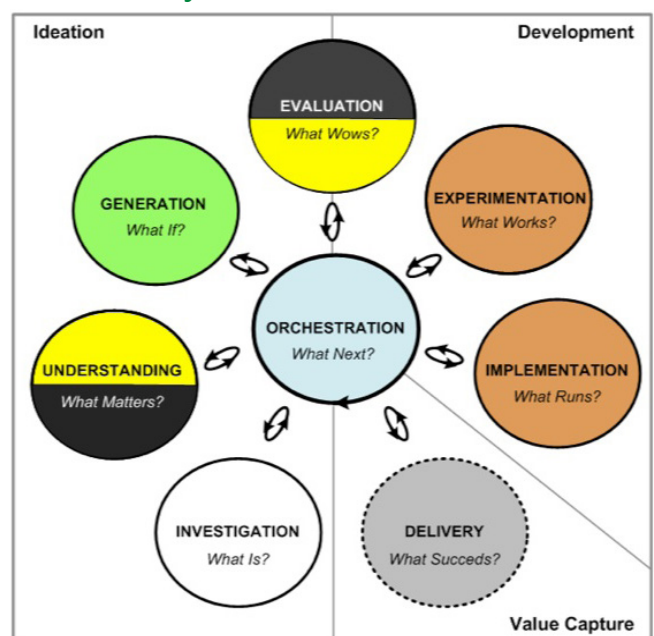
Contact: Dr Rob Phaal

Developing and sustaining strategic innovation systems in the 'War Room'

HiFFi is a framework, process and toolset for developing and sustaining Strategic Innovation Systems (SIS) within organisations. HiFFi incorporates a collection of methods that are orchestrated by roadmapping techniques and updated in 'War Room' sessions. This provides a customisable and agile system for innovation. HiFFi supports a systematic approach to innovation enabling interrelationships between different processes (see figure). This approach aims to address two common challenges: a) incomplete and unconnected system; and b) poor information flows and communication between subsystems and stakeholders.

The HiFFi approach is being developed in collaboration with two organisations based in Mexico (Nakazawa CG and DUX Diligens). **Dr Alejandro Torres Padilla** from DUX is spending a year in Cambridge as a visiting scholar, with **Ricardo Gonzalez Nakazawa** visiting regularly. We would welcome the opportunity to collaborate with companies interested in working with us to develop and test the approach.

Contact:
Ricardo Gonzalez Nakazawa (rg409@cam.ac.uk)
Dr Alejandro Torres Padilla (at686@cam.ac.uk)
Dr Rob Phaal (rp108@cam.ac.uk)



Three sessions present CTM research at Briefing Day

More than 150 people attended the annual IfM Briefing Day on 13 May. CTM research was well represented in the proceedings, with three separate sessions during the day.

'Roadmapping for strategy and innovation' attracted its usual high level of interest, and 'Bit-by-bit: capturing value from the digital fabrication revolution' provided an insight into the developments in this very topical research project.

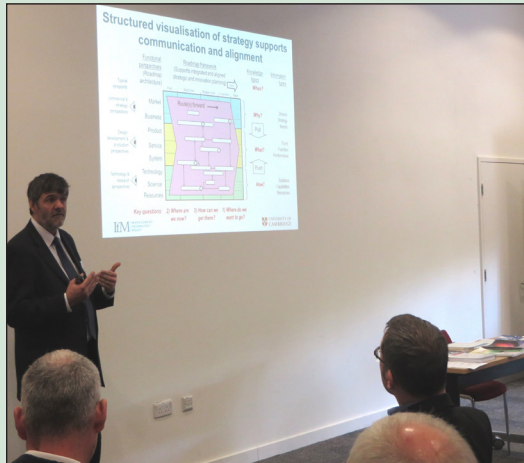
'Technology and innovation management: collaborative opportunities' presented a range of CTM projects where delegates could signal an interest to take part.

Key amongst these were two pieces of novel PhD research, which newsletter readers might also find relevant:

- How can corporate venture capital be used strategically?

This project aims to provide guidance on how corporate venture capital and portfolio strategy management can improve coordination of resources for responding to threats and opportunities.

Contact: Dayo Abunisawa (aa762@cam.ac.uk)



- Issues for R&D location with a focus on China

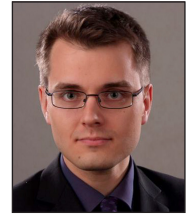
This research will identify the main factors to consider when deploying R&D resources in China. These include entry and growth strategy, creating synergy, embedding into the local science and technology ecosystem, and intellectual property protection.

Contact: Quan Zhou (qz249@cam.ac.uk)

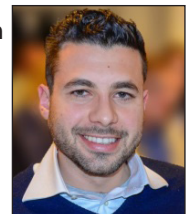


People

Dr.-Ing. Steven Peters is an academic visitor from the University of Karlsruhe (KIT) in Germany. He joins CTM and IfM during June and July 2014. Steven has been working as a postdoc and chief engineer with Prof Dr.-Ing. Gisela Lanza at her Chair of Production System and Quality Management at the wbk - Institute of Production Science within KIT. As the first KIT-Industry Fellow of Daimler AG, he has been working on concepts for industrialization of enabling technologies for automotive series production. During his stay at the IfM, he will be focusing on maturity level models for innovative manufacturing processes. For further information, please contact him at steven.peters@kit.edu



Gabriele Montelisciani is a PhD student in Management and Industrial Engineering at the University of Rome Tor Vergata, in partnership with the University of Pisa. During his visit, he will be working with Dr Tim Minshall, Dr Letizia Mortara and Dr Simon Ford on the Bit by Bit project. The research will be investigating the evolution of digital fabrication technologies and business models for desktop application.



He will also be researching into how the patents landscape is evolving in relation to open innovation initiatives. His research interests include: methods and tools for early stage innovation and creativity; collaborative design; sustainable innovation and development; Internet of Things; business modelling and entrepreneurship.

Mastering the art of useful and interesting student projects

Masters student projects at the IfM always offer a great opportunity for both students and host organisations to do something useful and interesting together.

This summer's longer dissertation projects have been no exception, whether addressing company specific technology and innovation management issues (assessment of a novel production technology), working on a STIM consortium project (investigating the scope of equity crowd-funding, developing technology intelligence processes), or collaborating on research into the scope of additive

manufacturing methods.

Applications explored here have included cellular deposition for organs, dental products, and in luxury and sports goods.

A good time to signal your interest in one of these longer projects is just before Christmas when project planning gets into detail.

For more information on the range of collaborative student project opportunities through the year see:

www.ifm.eng.cam.ac.uk/education/studentprojects/

Technology management research at Cambridge

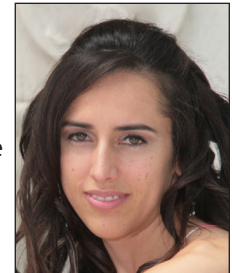
- Strategic technology management
- R&D project selection
- Software sourcing in manufacturing
- Enhancing creativity in new product development
- New product introduction collaboration
- Technology management: a process approach
- Technology selection
- Technology evolution in hi-tech firms
- Innovation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

Luzselene keen to stay in touch after completing her PhD

Luzselene Rincon recently completed her PhD under Dr Tim Minshall's supervision. Her thesis was entitled: *How do innovation management consultants modify the relationship between R&D and marketing participants*

as a consequence of their intervention? She found the consultancy approach followed by the innovation management consultants is key to achieving changes in the R&D and marketing relationship.

She has returned to Mexico and is very keen to keep in touch and to collaborate in areas such as open innovation, competitive intelligence and strategic technology management. She can be contacted at eneeszul@hotmail.com



New publications

Ahn, J M, Mortara, L, and Minshall, T (2014): Longitudinal effects of open R&D strategy on firm performance: comparative study of the UK and Korea; R&D Management Association (RADMA) Conference, Stuttgart, Germany, 3-6 June.

Ford, S J, Ferriani, S, and Probert, D R (2014): Overcoming the innovation barrier: A search-selection model of breakthrough innovation in large firms; In Pfeffermann, N, Minshall, T, and Mortara, L (eds) *Strategies and Communications for Innovations*, Heidelberg: Springer, pp 41-62.

Ford, S J, Routley, M J, Phaal, R, and Probert, D R (2014): The industrial emergence of commercial inkjet printing, *European Journal of Innovation Management*, 17(2), pp 126-143.

Garnsey, E W, Ford, S J, and Heffernan, P (2014): The evolution of industries in diverse markets: a complexity approach; In Strathern, M, and McGlade, J (eds) *The Social*

Face of Complexity Science, Litchfield Park: Emergence Publications, pp 159-189. ISBN 978-7939158-13-1.

Kerr, C I V, Phaal, R, and Probert, DR (2014): Depicting the future strategic plans of the Royal Australian Navy using a roadmapping framework as a visual composite canvas, *Technology Analysis & Strategic Management*, 26 (1), pp 1-22.

Lubik, S, and Garnsey, E (2014): Entrepreneurial Innovation in Science Based Firms; In Chell, E, and Mine Karatas-Ozkan (eds) *Handbook of Research on Small Business and Entrepreneurship*, Edwards Elgar.

Mashhour, A, Probert, D, and Phaal, R (2014): Characterizing the acquisition of complex systems: the case of the mission critical communications industry, R&D Management Association (RADMA) Conference, Stuttgart, Germany, 3-6 June.

Rincon Arguelles, L, Minshall, T, and Phaal, R (2014): Effect of innovation management consultancy services on the R&D and marketing relationship, 23rd International Management of Technology (IAMOT) Conference, Washington, 22-26 May.

Diary 2014

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

September

23 and 24

Realising the potential of early stage technologies

Two-day course
IfM, Cambridge

October

8

Technology intelligence

One-day course
IfM, Cambridge

November

4

Visual approaches for strategy and innovation management

One-day course
IfM, Cambridge

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