

## **R&D Management Tools: Technology Assessment, Forecasting and Roadmapping**

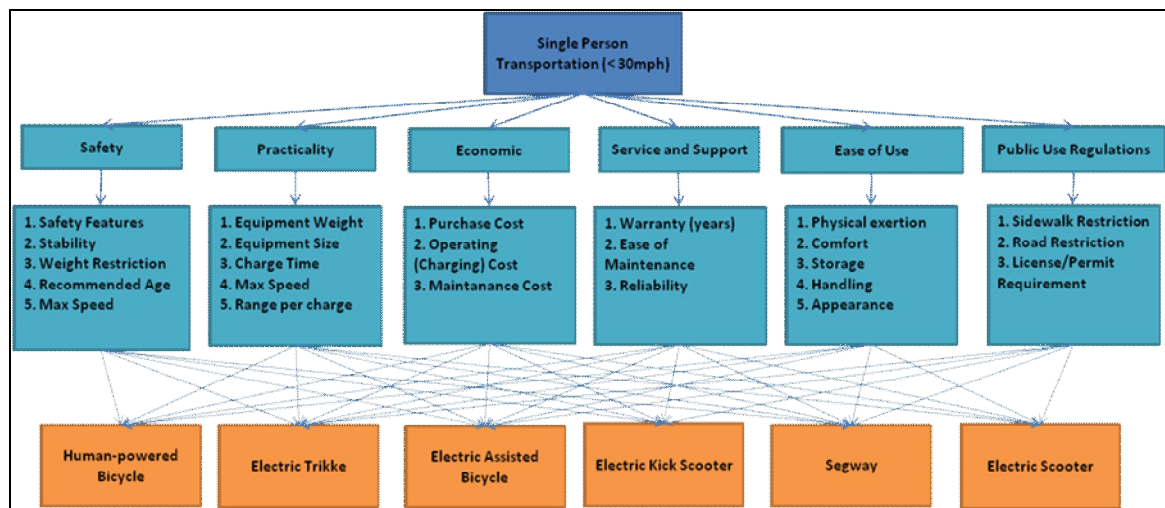
Time: December 15-16, 2015, 10-16  
 Place: Tampereen teknillinen yliopisto, Festia, Kappelisali, Tampere  
 Instructor: Prof Tugrul Daim, Portland State University  
 Credits: 2 cr  
 Enrollment to [sari.sievanen@tut.fi](mailto:sari.sievanen@tut.fi)

### **Overview:**

This course will review essential tools for managing research and development (R&D). R&D management is one of the critical elements in science and technology driven organizations. The organizations need to be aware of technology trends and set their strategies to develop or acquire technologies to be ahead of the game. The following groups of tools will be covered in this class:

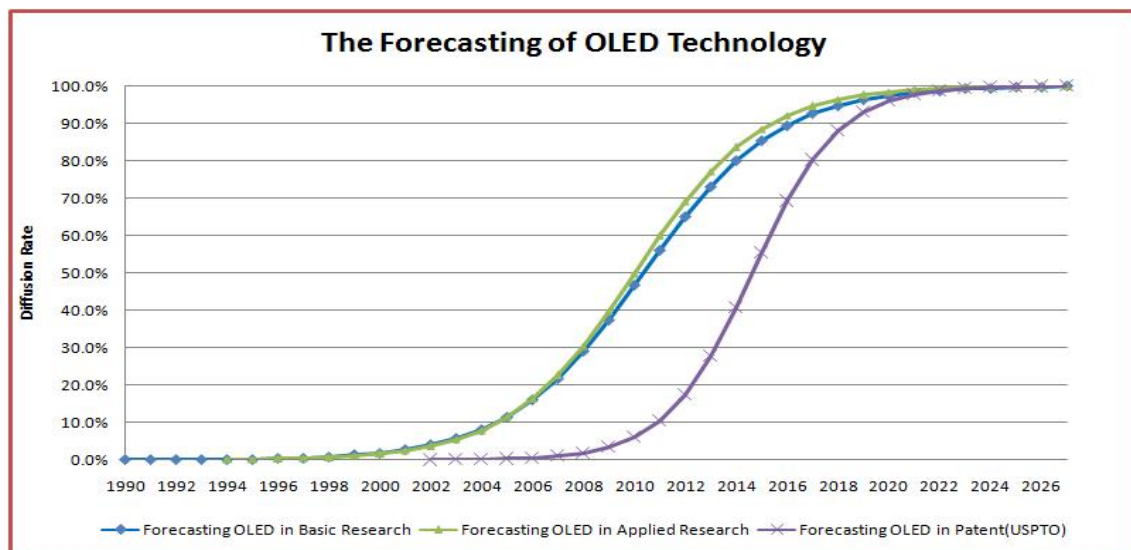
- Technology Assessment

Technology assessment is a process to identify technological gaps in an organization's strategy and develop a multi-dimensional technology evaluation framework to evaluate candidate technologies addressing the gaps.



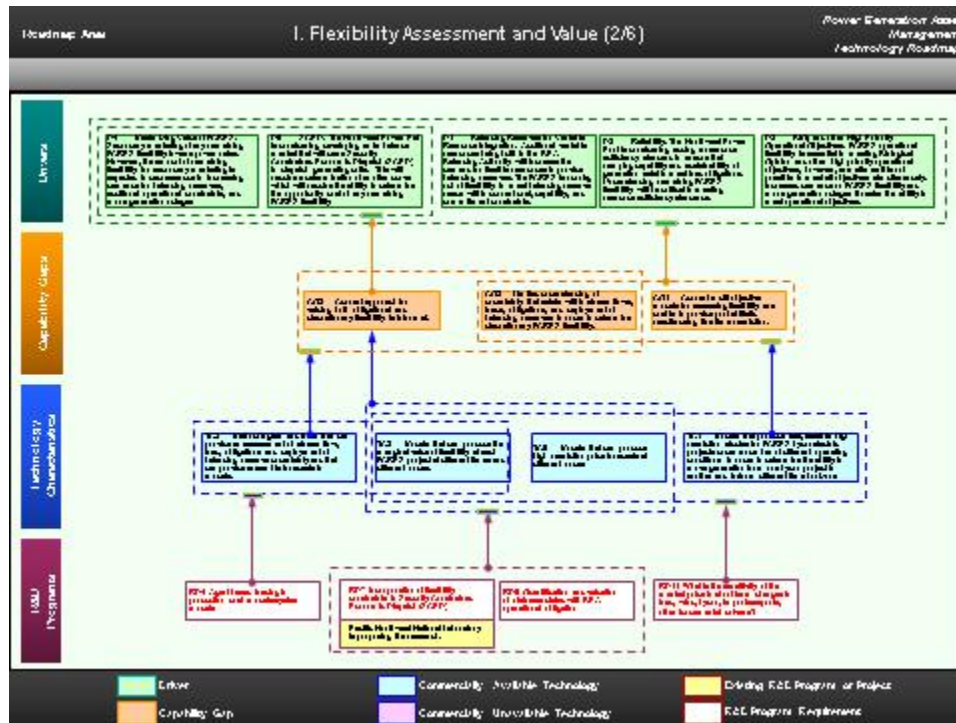
- Technology Forecasting

Technology forecasting covers a set of tools to evaluate future impact of emerging technologies.



- Technology Roadmapping

Technology roadmapping is a methodology leveraging technology assessment and forecasting analyses to develop and communicate a plan to address the technological gaps and thus help the organization reach its strategic goals



### Course Schedule and Outline:

#### Day 1

Introductions	10:00
Class Expectations	
Managing R&D	10:30
Break	
Technology Assessment	11:30
Lunch	12:00
Technology Assessment Exercise	1:30
Technology Forecasting	2:00
Break	
Technology Forecasting Exercise	2:30
Break	
Review	3:30
Close	4:00

## Day 2

Overview of course and summary of Day	10:00
Technology Roadmapping	
Break	
Technology Roadmapping Exercise	11:00
Lunch	12:00
Exercise Continues	1:30
Team Presentations	2:30
Break	
Review	2:30
Close	3:00

## Course Material:

1. Daim T, Oliver T, “Implementing Technology Roadmap Process in the Energy Services Sector: A Case Study of a Government Agency”, ***Technological Forecasting and Social Change***, Vol 75, No 5, June 2008, pp 687-720
2. Amer M, Daim T, “Application of Technology Roadmaps for Renewable Energy Sector” ***Technological Forecasting and Social Change***, Vol 77, No 8, 2010, pp 1355-1370
3. Fenwick D, Daim T, Gerdri N “Value Driven Technology Road Mapping (VTRM) Process Integrating Decision Making and Marketing Tools: Case of Internet Security Technologies” ***Technological Forecasting and Social Change***, Vol 76, No 8, 2009, pp 1055-1077
4. van Blommestein K and Daim T “Residential Energy Efficient Device Adoption in South Africa” ***Sustainable Energy Technologies and Assessments*** Vol 1, No 1, 2013, pp 13-27
5. Lamb A, Daim T, Leavengood S, “Wood Pellet Technology Roadmap” ***IEEE Transactions on Sustainable Energy*** Vol 3, No 2, 2012, pp 218-230
6. Martin H, Daim T, “Technology Roadmap Development Process (TRDP) for the Service Sector: A Conceptual Framework”, ***Technology in Society*** Vol 34, No 1, 2012, pp 94-105
7. Amer M, Daim T, “Selection of renewable energy technologies for a developing county: A case of Pakistan” ***Energy for Sustainable Development*** Volume 15, Issue 4, December 2011, Pages 420-435
8. Daim T, Intarode N “A Framework for Technology Assessment: Case of a Thai Building Material Manufacturer” ***Energy for Sustainable Development***, Vol 13, No 4, 2009, pp 280-286
9. Daim T, Gerdri N, Kockan I, Kocaoglu DF “Technology Development Approach for the Adoption of Future Powertrain Technologies: A Case Study on Ford Otosan Roadmapping Model” ***Journal of Transportation Systems Engineering and Information Technology*** Vol 11, No 2, 2011, pp 58-69
10. Daim T, Kocaoglu D, “Exploring the role of technology evaluation in the competitiveness of US Electronics Manufacturing Companies” ***International Journal of Technology Management***, Vol 48, No 1, 2009, pp 77-94

## REFERENCE TEXTBOOK

Daim T, Pizarro M, Talla R ***Planning and Roadmapping Technological Innovations***, Springer, 2014 (\*)

(\*) This is an optional book – not a requirement

## **Instructor Bio:**

**Tugrul Daim** is a Professor and PhD Program Director in the Department of Engineering and Technology Management at Portland State University. Prior to joining PSU, he had worked at Intel Corporation for over a decade in varying management roles. At Intel he managed product and technology development. He also has several professional certifications including New Product Development Professional and Project Management Professional. Professor Daim has been consulting to several organizations in sectors ranging from energy to medical device manufacturing. He has been helping organizations including US Dept of Energy, Energy Trust of Oregon, Biotronik, Biopro, Elsevier and many others to develop technology roadmaps for their future investments. He is also a visiting professor with the Northern Institute of Technology at Technical University of Hamburg, Harburg where he teaches similar short courses. He has been recently appointed as Extraordinary Professor at the Graduate School of Technology Management at University of Pretoria in South Africa. He is frequently invited to give lectures to many multinational companies including IBM, Xerox and HP as well as



universities around the world including his recent visits to Finland, Japan and Germany. He has published over 200 refereed papers in journals and conference proceedings. His papers appeared in Technological Forecasting and Social Change, Technovation, Technology Analysis and Strategic Management, Computers and Industrial Engineering, Journal of Medical Systems, Energy, Energy Policy and many others. He has coauthored four books of readings and several proceedings. He is the Editor-in-Chief of International Journal of Innovation and Technology Management and North American Editor of Technological Forecasting and Social Change. He received his BS in Mechanical Engineering from Bogazici University in Turkey, MS in Mechanical Engineering from Lehigh University in Pennsylvania, MS in Engineering Management from Portland State University, and PhD in Systems Science: Engineering Management from Portland State University in Portland Oregon.