

Course Syllabus Autumn 2019

MF2084 Managing Research and Development (6.0 credits)

About the course

The aim of this course is to make students familiar with models and frameworks used in strategic management and organizing, and to give them in-depth understanding of how these models and frameworks can be skillfully applied in different R&D settings. A central aspect of this is to understand the inter-relationship between business strategies on the one hand and technology-, innovation- and R&D strategies on the other, in order to be able to work with, lead, and improve business-driven research and development activities. Furthermore, students should acquire substantial knowledge about the managerial challenges of organizing R&D activities in industrial firms and learn analytical frameworks, tools and methods for R&D management. The course comprises a set of lectures, exercises, and case discussion sessions. Moreover, students will perform a project in which they apply the theoretical models and frameworks that have been introduced throughout the course. The project concerns an analysis of specific R&D management issues and challenges, and to point to possibilities for improvement. More specifically, the lectures and exercises will focus on the following domains:

- Different theories and frameworks related to strategy
- Strategy on different levels in a firm, e.g. corporate, business and R&D strategies
- R&D strategy
- Organization theory and organization design
- Organizing R&D
- Lean in R&D
- Product strategies and portfolio management
- Product families, platforms and modularization
- Knowledge Management and learning

Students are expected to participate actively in class discussions, and will for some of the class sessions be asked to undertake preparatory work, in groups or individually. These preparations include the execution of a scenario analysis, and the analysis of two case studies (performed in groups, max two bonus points at each occasion).

Learning objectives

After having taken this course, students will have acquired the following knowledge and skills:

- Be familiar with how theory regarding strategy and organization has evolved over time.
- Be able to apply basic concepts, theories and analytical frameworks related to strategy and organization.
- Be able to analyze industry structures, how they have changed over time and how innovation affects industries and competition.
- Be able to segment markets.

- Be able to analyze the interplay between R&D and different corporate and business strategies, and their implications for how firms should organize development activities.
- Be familiar with different ways of organizing firms, and how these structures relate to corporate and business strategy.
- Understand different ways of leading and organizing development activities and under what circumstances different ways of organizing are fruitful.
- Understand advantages and disadvantages of different ways of organizing R&D.
- Be familiar with different economic models for managing R&D.
- Understand relevant aspects of distributed R&D, business- and value-driven R&D, and lean R&D.
- Be familiar with benefits and drawbacks related to outsourcing and offshoring of R&D activities.
- To be familiar with different integration mechanisms that can be used when organizing R&D.
- Be able to design product portfolios.
- Understand benefits and drawbacks of product platforms and modularization, as well as contingency factors influencing their use.

Examination

Examination is based upon results on the written exam and on the project assignment (see separate PM for the project assignment, which will be distributed at its introduction). In addition to this, students can receive additional points on the exam by performing class preparations in a satisfactory manner.

The grading is made as follows:

Written exam, max 50 points

Project assignment, max 25 points

Bonus points for undertaken preparatory work, max 6 points (3+2+1)

Grading scale for both written exam and project assignment is: A, B, C, D, E, FX, F.

The final overall grade on the course is derived by calculating the weighted average of the grades received on the written exam and the project assignment. A score of at least 20 points at the written exam is required to pass the course.

Examiner

Professor Mats Magnusson, matsmag@kth.se

Schedule (OBS! May be subject minor changes – pay attention to messages from the course responsible via CANVAS)

Day	Time	Location	Seminar subject	Lecturer	Literature
Tue 27/8	13:00-17:00	M33	Introduction Strategic Management Fundamentals Industry analysis	MM	Grant ch. 1-2 Grant ch. 3-4, 7
Fri 30/8	08:00-12:00	H1	Industry analysis, cont. Segmentation <i>Project Assignment Introduction</i>	MM JH	Grant ch. 3-4, 7
Tue 3/9	13:00-17:00	D3	Resource-Based View Knowledge-Based View	MM	Grant ch. 5 Leonard-Barton
Fri 6/9	08:00-12:00	U31	Resource-Based View Knowledge-Based View Dynamic Capabilities <i>Presentation of Project Assignment Proposal. Discussion of Project Assignment.</i>	MM JH/JA	Grant ch. 5, 13, 15 Leonard-Barton Teece Doz and Kosonen
Tue 10/9	13:00-17:00	V3	Organization theory and design	JH	Grant ch. 6 Daft
Fri 13/9	08:00-12:00	V3	Scenario analysis Workshop <i>Introduction of Scenario Analysis Assignment</i>	MM	Grant ch. 8
Tis 17/9	13:00-17:00	M33	Organising R&D Corporate Entrepreneurship Ambidextrous organizations	MM	Grant ch.6, 9, 12-14 Burgelman Benner and Tushman O'Reilly and Tushman
Fri 20/9	08:00-12:00	U31	R&D- and technology strategies R&D Collaborations Digitalization, Technology Platforms and Ecosystems <i>Presentation of Scenario Analysis Assignment</i>	MM	Grant ch. 3-4, 9-13, 15 Nobelius Von Zedtwitz and Gassmann

Tue 24/9	13:00-17:00	FB52	Managing Complex Product Projects Uncertainty Management	ÅS	Grant ch. 13-15
Fri 27/9	08:00-12:00	Q2	Multi-project management Product Platform and Modularization <i>Introduction of Case Study Assignment</i>	MM	Grant ch. 13 Cusumano and Nobeoka Magnusson and Pasche Le Petit Chef
Tue 1/10	13:00-17:00	U1	Knowledge Management Organizational learning	MM	Nonaka Chiesa
Fri 4/10	08:00-12:00	U1	<i>Presentation of Case Study Assignment</i> Guest Lecture	MM JW/PS	
Tue 8/10	08:00-12:00	W43	R&D project portfolio management Workshop Summary of course, information regarding written exam Guest Lecture	JH/MM IB	Grant ch. 13 Gutierrez and Magnusson Reinertsen Martinsuo
Fri 11/10	08:00-12:00	H1	<i>Presentation of Project Assignment</i> Guest Lecture	JH/JA AJ	
Thu 24/10	14:00-18:00	V32, V34	Written exam		
Fri 18/12	14:00-18:00	L31	Written Re-exam		

Lecturers

MM: Mats Magnusson, KTH

JH: Jens Hemphälä, KTH

JA: Johan Arekrans, KTH

AJ: Anders Johanson, Husqvarna (adjunct professor KTH)

ÅS: Åke Sundelin, Ericsson

PS: Pia Skogsberg, Getinge

JW: Johan Widman, Getinge

IB: Ingrid Bertmar, Assa Abloy

Literature

Course book

Grant, R.M. (2018), *Contemporary strategy analysis*, Wiley and Sons Ltd, Hoboken, NJ.

Please note that any edition from the 5th will work well. However, if you use an earlier edition, please observe that the numbers of the chapters may have changed.

Book excerpts (copies of selected parts will be distributed)

Bhidé, A. (2000). *The Origin and Evolution of New Businesses*, New York, Oxford University Press.

Cusumano, M. and K. Nobeoka (1998). *Thinking Beyond Lean: How Multi-Project Management is Transforming Toyota and Other Companies*, The Free Press, New York.

Daft, R.L. (2008). *Organization Theory and Design*, Cengage Learning, Mason.

Articles (available on course homepage and/or via KTH library)

Benner, M. J. and Tushman, M. L. (2003), Exploitation, exploration, and process management: The productivity dilemma revisited, *Academy of Management Review*, Vol. 28, No. 2, pp. 238-256.

- Burgelman, R.A. (1983), Corporate Entrepreneurship and Strategic Management: Insights from a Process Study, *Management Science*, Vol. 29, No. 12, pp. 1349–1364.

Chiesa, V, Frattini, F, Lazzarotti, V & Manzini, R. (2009), Performance measurement in R&D: exploring the interplay between measurement objectives, dimensions of performance and contextual factors, *R & D Management*, 39, 488-518.

Doz, Y. L. and Kosonen, M. (2010), Embedding Strategic Agility – A Leadership Agenda for Accelerating Business Model Renewal, *Long Range Planning*, Vol. 43, pp. 370-382.

Gutiérrez, E. and Magnusson, M. (2014), Dealing with legitimacy: A key challenge for Project Portfolio Management decision makers, *International Journal of Project Management*, Vol. 32, pp. 30-39.

Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development, *Strategic Management Journal*, Vol. 13, pp. 111-125.

- Magnusson, M., and Pasche, M. (2014), A contingency-based approach to the use of product modules and platforms, *Journal of Product Innovation Management*, Vol. 31, No. 3, pp. 434-450.
- Martinsuo, M. (2013), Project portfolio management in practice and in context, *International Journal of Project Management*, Vol. 31, pp. 794-803.
- Nobelius, D. (2004), Towards the sixth generation of R&D, *International Journal of Project management*, Vol. 22, No. 5, pp. 369-375.
- Nonaka, I. (1994), A dynamic theory of organizational knowledge creation, *Organization Science*, Vol. 5, No. 1, pp. 14-37.
- O'Reilly, C. A. III. and M. L. Tushman (2004), The ambidextrous organization, *Harvard Business Review*, April, pp. 74-81.
- Reinertsen, D. and Schaeffer, L. (2005), Making R&D lean, *Research Technology Management*, Vol. 48, No. 4, pp. 51-57.
- Teece, D. (2007), Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance, *Strategic Management Journal*.
- Von Zedtwitz, M. and Gassmann, O. (2002), Market versus technology drive in R&D internationalization: four different patterns of managing research and development, *Research Policy*, Vol. 31, No. 4, pp. 569-588.

Please note that changes may be made to the literature list and that additional material may be included!