

HOME EXAM
TEIO02 PRODUCT DEVELOPMENT AND INNOVATION MANAGEMENT
MONDAY 8 DECEMBER TO SUNDAY 11 DECEMBER

EXAM SUBMISSION

The completed exam should be submitted both via it's learning and to the Urkund plagiarism control system (annbe84.liu@analys.orkund.se) before the exam deadline, which is **Sunday 11 December at 20.00**. *If your exam has not been submitted on time, we may choose not to mark it or to reduce your score.*

QUESTIONS DURING THE EXAM

If you have any questions concerning exam questions, please contact Anna Bergek (anna.berge@liu.se).

FORMALITIES

- Answers should not be longer than two pages per question, with normal font size (10-12 pt). Please use serif fonts (e.g. Times New Roman, Garamond, Cambria), not sans serif fonts (e.g. Arial, Calibri, Helvetica, Century Gothic).
- Different teachers will grade different questions. In order for this to work smoothly, we need you to help us by doing the following:
 - Start the answer to each question on a new page.
 - Start the answer with the question number. (You don't need to repeat the question.)
 - Write your name and your personal number on each page of your exam document.

INSTRUCTIONS ON ANSWERING EXAM QUESTIONS

- It is your responsibility to show us that you have understood the main points described in the literature and the relevance of the literature for companies involved in new product development and innovation. You should also demonstrate your ability to apply theoretical perspectives and models to empirical examples. *Keep this in mind when you answer each question!*
- It is not allowed to co-operate or use other people's solutions!
- The grading will be based on the course's general grading scheme as described in the course information document. On an overview level, a good answer contains the following:
 - Description of relevant pieces of literature – related to each other and preferably compared and/or integrated rather than described one by one.
 - Conclusions based on the described literature: What are the main points for the question (according to you)?
 - Examples that clarify the points made. You may use your own examples, examples found in the literature or the group assignment cases. "Reinterpreting" an example used in one paper using the framework of another paper is a good way to demonstrate that you have understood and can apply what you have read.
 - Your comments/reflections: What is your opinion on the matter? However, all such comments/reflections have to be substantiated by clear arguments/evidence/examples.

- Use of literature
 - Make sure that you use all relevant within-theme literature when you answer each question. In order to get a higher grade than 3, you should try to use relevant literature from other themes as well. You are allowed to *complement* the course literature in order to develop your answers further, but do not substitute course literature for other sources making the same points!
 - Explicitly refer to the literature you use. Do not assume that we can “read between the lines” and understand what theories/models you are thinking of. When you refer to course literature, it is enough to state the name(s) of the author(s) + publication year, but when you use other sources you need to add the full reference in a footnote.
 - It is *not* allowed to copy and paste from papers – use your own words! You may use a few citations in order to strengthen your argument, but only if you use citation marks and refer to the paper in a correct way.
 - Separate clearly between your own comments/reflections and the points made in the literature, by using references to literature and markers like “in my opinion” etc.
- Your answers need to provide enough information for us to understand your argument and thinking. Do not only provide your conclusions, but also the analysis leading up to that conclusion. Make sure that your answers have a clear disposition. (Tip: Outline your argument using bullet points before you start writing text.)

GRADING

The exam consists of five questions – one for each course theme. Each question will be assessed according to the general grading scheme and will receive a point score (0-10 points) that reflects the grade. A grade 3 corresponds to 5-6 points; a grade 4 corresponds to 6.5-8 points and a grade 5 corresponds to 8.5-10 points. The point scores will be added up to determine your total exam grade. You need 25 points in total to pass the exam. You need 32 p for a grade 4 and 42 p for a grade 5. We will make an overall assessment of the entire exam for those who come close to a higher grade.

QUESTIONS (1-5)

Theme 1: Managing innovation within firms

The company 3M, well-known for its innovativeness and the birthplace of masking tape, Thinsulate, and the Post-it note, experienced a large restructuring during the beginning of the 2000s. With James McNerney, who was the first outsider to become the CEO of 3M, joining in 2001, the company changed its focus from innovation to efficiency with a diminished workforce, intensified the performance-review process, and the introduction of a Six Sigma program. Under McNerney, the R&D function at 3M was systematized with phase-review processes and much less freedom to pursue potential ideas. Then, four and a half years after arriving, McNerney abruptly left for a bigger opportunity, the top job at Boeing. His successors faced a challenging question: Had the relentless emphasis on efficiency made 3M a less creative company? It certainly seemed so, considering that the share of sales coming from products released in the last five years had decreased from one third to one quarter.

- a. By using the course literature, explain how efficiency programs as in the case above can influence the prerequisites for creativity and innovation in an organization. (40% of grade)
- b. What can a company like 3M do to revitalize its creative climate and increase its innovation rates? (Use the course literature) (40% of grade)

- c. What trade-offs between creativity and efficiency need to be made in this revitalization process? (Use the course literature) (20% of grade)

Theme 2: New product development

In his lecture *Co-locating R&D*, professor Christian Berggren argued that geographically distributed 'global' project organizations can be useful for product development addressing incremental innovation. He further argued that radical innovation, on the other hand, relies on geographical proximity. Use the course literature to qualify and elaborate on these arguments.

- a. Why may geographically distributed organizations be useful for incremental innovation projects, but less useful for radical innovation projects? Start your answer by defining the concepts of radical and incremental innovation with reference to relevant literature. (60% of grade)
- b. As a manager for a radical innovation project that relies on input from a number geographically distributed firms, which measures could you take to counteract the disadvantages and manage the collaborative project? Justify your proposed measures by using the literature. (40% of grade)

Theme 3: Managing technology and knowledge

Using a resource based perspective on strategy, technology strategies should be based on a firm's capabilities. Literature on technology strategy suggests that capabilities may change over time, i.e. they may be dynamic. In his lecture on Knowledge, dynamic capabilities and competitive advantage, Fredrik Tell defined dynamic capabilities as "the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market position". Use the course literature and the Scania case to elaborate on the concept of dynamic capabilities. How can you relate the concept of dynamic capability to Scania's technological (i.e. architectural and component knowledge) and organisational strategies (i.e. re-organising internal organisation, and managing collaboration with new suppliers)? *Note that Trott uses the concept of 'dynamic competence-based theory of the firm' instead of the concept of 'dynamic capabilities'.* (100% of grade)

Theme 4: Product and brand strategy

Product lines, product platforms, product families and brands are four interrelated concepts, which can be considered important components or subsets in a firm's product strategy. Use the literature to define these concepts, explain how they differ and show how they are related to each other. Provide empirical examples from the literature and/or from the cases covered in the course to illustrate your reasoning. (100% of grade)

Theme 5: Technology and industry dynamics

In the early 1980s, the passenger airline business was under the control of established airline companies. There was no price competition and access to hub airports was restricted. In 1984, the Irish parliament revolted against a law that would imprison and fine travel agents convicted of discounting airline tickets below ministerial approved prices, and as a result the Dublin-London (Luton) route was opened up for low-cost carrier Ryan Air in May 1986. The deregulation of this route was followed by many others in

Europe and elsewhere. Most established airline companies ignored the new phenomenon. For example, a Lufthansa board member stated that their pricing strategies were not for debate, since their high quality product justified a substantial difference in price compared to low-cost carriers. Just a few years later, the number of passengers had quadrupled on the London-Dublin route and the number of tourists to Ireland had tripled. Similar effects were seen on other low-cost carrier routes. Most established airlines then began to realize the challenge that low-cost carriers implied. They responded by entering the low-cost segment through alliances or newly established subsidiaries and/or by differentiating their high-end (high service – high price) services even further. However, for many of them the response was already late by 2-5 years.

- a. To what extent and in what way could the introduction of low-cost carriers be considered to be a discontinuous innovation? Use the various definitions and typologies of innovation in the course literature to determine what type of innovation this was. (20% of grade)
- b. Imagine working for a leading established airline company *when the low-cost airlines first entered the market*. In a meeting, you hear your company's managing director saying that low-cost carriers are nothing to worry about. However, you are seriously worried that they may become a threat to your company's leading market position. (i) What theory-based arguments can the managing director use in favor of her opinion that your company – as well as other established airline companies – will have no problems to survive this particular discontinuity? (ii) What theory-based counterarguments can you use to convince her that this may be a bigger threat than she seems to think, i.e. what does the course literature have to say about the circumstances under which – and why – established, market-leading companies may have difficulties surviving a discontinuous innovation of this type? *Make sure that your answer is aligned with your answer to sub-question (a)*. (60% of grade)
- c. What are the key features of this story from a market dynamics and institutional dynamics perspective (based primarily on the limited information provided above and your own assumptions)? What could the established airline companies have done *with respect to the innovation system level of analysis* to improve their chances of survival and competitiveness? (20% of grade)

Good luck!

/Nicolette, Thomas, Dedy and Anna