



**EXAMINATION IN COURSE TMM 4225 ENGINEERING
COLLABORATION IN DISTRIBUTED TEAMS: MANAGEMENT AND
SMART USE**

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Date : 3 December 2011

Time : 4 hours

Weighting : 7,5

Aids allowed : D: No written or handwritten examination support materials are permitted.
Certain, specified calculator** are permitted.

** "Certain, specified calculator" means a calculator with simple, numerical and trigonometrical functions such as +, -, sine, cosine etc. The type of calculator is to be easy for examination invigilators to recognize.

All tasks are to be answered. Each answer has to be marked with the corresponding task-number and index. The answers must be clearly and nicely written. It will be emphasized that the text is clear and concise. Sketches should be made in such a scale that they are easily understood.

Language : English

Number of pages : 4

Number of appendix : 0 (none)

To be subjected to censorship by 3 weeks from exam date.

Problem 1: Benefits, collaboration activities and collaboration tools

Engineers and other knowledge workers spend a considerable amount of time collaborating with others; in various collaboration processes within departments, across departments and also in extended networks that also includes customers, suppliers and business partners. To an increasing extent, engineers and other knowledge professionals must also collaborate over geographical distance, sometimes across different time zones. The knowledge exchange taking place in these networks is complex and unpredictable, and it can be difficult to support.

Answer the following points:

- A. Describe some possible categories of business benefits companies can realize from improving the way they collaborate internally and with external partners. For each category, provide an example that includes a short description of a specific benefit, and a rationale describing exactly how improved collaboration can contribute towards realising that specific benefit.
- B. Collaboration happens in many different contexts; in the office, in meetings, at clients' locations, whilst travelling, from home, etc. Provide a list of collaboration and communication activities in engineering companies (one example can be conference calls). Provide a short description of each activity, where you describe the typical context of this activity and the people typically involved in this activity. Indicate whether each activity is synchronous or asynchronous (or both), and whether it is same place or different place (or if it can be both).
- C. Provide a list of different categories of tools supporting collaboration (one example of such a category can be web conferencing tools), including a short description of what each tool category can offer in terms of functionalities for engineers / engineering teams.

Problem 2: Improving collaboration & concept development

Engineering Design Services Ltd. is an engineering company that provides CAD (computer-aided design) services to a range of international companies in the automotive industry. The company HQ is located in London, with satellite offices in Manchester, Milan, Munich and Oslo.

Due to falling profits and lost business due to and increasing competition from low cost countries, the management team is looking for ways of improving profitability through raising productivity. The company CEO has hired a consulting company to recommend ways of improving the way the company operates, and the consulting company has provided a report with a number of recommended improvements, including the introduction of a new Enterprise 2.0 platform (Enterprise 2.0 here means the use of "Web 2.0" technologies within an organization to enable or streamline business processes while enhancing collaboration - connecting people through the use of social media tools).

The recommendations are rather high-level, without much detail. The management group find the high-level recommendations outlined in the report promising, and you have been appointed as the internal project manager responsible for implementing the recommendations and realising benefits from the new platform and related improvement initiatives.

You have read the report and are concerned that the recommendations (although high-level) are focusing too much on the technology dimension, and not enough on the process, organisational and cultural aspects of collaboration. Furthermore, your view is that the report jumps to conclusions without sufficient knowledge about the business and the specific problems experienced by the company, given the special characteristics of the automotive industry. You have discussed this with the CEO, and you have been authorized to revise the recommendations outlined in the report to make them fit better with the company's specific business context. Refer to the descriptions in Problem 1 where (if) relevant.

Answer the following points:

- A. Describe what you would do to check if the recommendations in the report are well aligned with the overall objectives (business goals) of the business, the internal way of working and existing collaboration challenges and barriers. Use literature references where appropriate.
- B. List a set of investigation activities that you would recommend to make it possible to define a set of precise collaboration requirements that can be used to develop a solution that is fit for purpose, including how you would collect and analyse the data.
- C. Provide a description of how the company can define a new collaboration concept (A concept is a "cognitive unit of meaning"—an abstract idea or a mental symbol sometimes defined as a "unit of knowledge"). Describe the elements or dimensions that you think should be a part of such a collaboration concept. Include technology as well as non-technology elements or dimensions.

Problem 3: Return on Investment

The CEO of the company described in Problem 2 is interested in maximising the return on investment (ROI) of the new collaboration platform, and has asked you to provide an overall framework for an ROI assessment. The company is also interested in how they can manage collaboration better, including both costs and benefits related to collaboration.

Answer the following points:

- A. Provide a structured approach for an ROI evaluation in the form of a sequence (list) of activities that you would carry out or recommend to arrive at a solid basis for comparison of costs and benefits between the current situation and the new situation (post implementation) respectively.

- B. Provide a list of common cost elements that should be included in the analysis, and for each cost element indicate how you would collect and measure / assess the data.
- C. Provide a list of common benefit elements that should be included in the analysis, and for each benefit element indicate how you would collect and measure / assess the data. Relate the benefit elements to the relevant cost elements where possible.

Problem 4: Reflection exercise

Reflect on the topic productivity in knowledge work. Productivity in knowledge work is not fully understood, and difficult to manage. Still, companies that do succeed in breaking this down into something that is concrete and manageable, can improve their competitiveness based on productivity-related advantages.

Answer the following points:

- A. Explain the difference between effectiveness and efficiency, and how these two concepts are related.
- B. Explain why the two concepts effectiveness and efficiency are both important for companies that are seeking to improve collaboration.
- C. Collaboration is often referred to as a key component of effective decision making; collaborative decision making. Explain reasons for why decision making in multidisciplinary teams can be difficult. Finally, provide a list of success factors for effective decision making in teams that are both multidisciplinary and geographically distributed, to overcome these difficulties.

GOOD LUCK!