

Exam: SPM 4110 – Designing Multi-Actor Systems
Department of Systems Engineering
Faculty of Technology, Policy and Management
Delft University of Technology

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Important Rules & Notes:

- The use of all course material on paper (lecture notes, personal notes, lecture slides, books) is allowed including a dictionary, if needed.
- Any communication device is forbidden to use and should be turned off and out of sight.
- Be concise and sharp in your answers; the insight into the material and line of reasoning is most important. Lengthy answers can also work against you. So, avoid excessive writing in the hope of hitting the right answer or confusing your instructor. Your answers should be relevant and up to point.
- Reference to course material in your answers is allowed and can even support your argument, but always requires your concise rephrasing or summary (so not only “See page 20 in J.Doe, 2000” as your answer). Your answers should be self-contained.
- Answers have to be in good English, not Shakespearian good.
- Answers for each question should start on a new exam sheet.
- Answers should be expressed in your own words not exact copy from the sources.
- Use a black and/or blue pen for your answers.
- Your exam scripts will be read by human not a scanner of fancy handwritings :-). Please, pay attention to your handwritten text to be humanly readable :-).
- The exam will be corrected within the official TU Delft correction period.
- You can get 100 points in total. Handing in a page with your name is worth 10 points. The remaining 90 points are divided among the questions as per below.
- Disregarding the above rules/points may result in -5 points (subtracted from total points).

Question 1. (12 points)

Both Maier & Rechtin (2002) and Klir & Elias (2003) address general qualities of architectures in their contribution. Maier & Rechtin discuss the architect's product in points 3, 4 and 5 on page 18. Klir & Elias (2003) discusses his view on architecture on page 24.

- a. Discuss the links between the view of Klir on architecture and the 3rd point (“The architect's product, or deliverable ...”, page 18) of Maier & Rechtin. (6 points)
- b. Do the same for the 4th point (“The architect's product is not just a physical representation. ...”, page 18). (6 points)

Question 2. (16 points)

- a. In the contribution of Flood (1990, Liberating Systems Theory) six systemic metaphors are described. These metaphors represent six ways in which we structure our thoughts about reality. Explain in 2-4 short sentences (or key words) the distinguishing characteristics of each metaphor. (6 points)
- b. Consider the following two approaches to dealing with complex systems design:
 - Process Management, as described in the book of De Bruin, Ten Heuvelhof and In't Veld (2002)
 - Systems Engineering, which stands in the tradition of hard systems thinking (see the contribution of Jackson (1991, page 74))

For each of these approaches choose two metaphors that fit best to the view on systems that is advocated in this approach. Explain why and use the keywords of question a) in your answer. (10 points)

Question 3. (20 points)

Maier & Rechtin (2002) discuss socio-technical systems in Chapter 5.

- a. Explain the social (or social-technical) systems of Maier & Rechtin in terms of Checkland's typology of systems classes. (5 points)
- b. Give a short overview of four main issues in architecting of socio-technical (or social) systems according to Maier & Rechtin. (5 points)
- c. On page 79 Maier & Rechtin discuss **the four whos**. Support the importance of these questions in designing socio-technical systems with two arguments based on what you know on process management (as in De Bruin, Ten Heuvelhof and In't Veld (2002)) (5 points)
- d. In Chapter 8 Maier & Rechtin explain the role of modeling in systems architecting and various modeling perspectives relevant in systems architecting. Explain what special issues need to be addressed in model usage when architecting socio-technical systems. (5 points)

Question 4. (18 points)

- a. How can the Collaboration Engineering approach be used to support the transition phase when implementing an electronic patient file system in multi actor setting involving e.g. GGD, local hospitals, practitioners and specialists? (5 points)
- b. A thinkLet is a design pattern, how can design patterns be used (or newly developed) to share knowledge about the use of an electronic patient file system in multi actor setting involving e.g. GGD, local hospitals, practitioners and specialists? (5 points)
- c. What type of domain expert could be trained as a practitioner to run collaborative work practices for a multi actor collaboration platform involving e.g. GGD, local hospitals, practitioners and specialists? (8 points)

Question 5. (24 points)

Decision making processes often are criticized for taking too much time.

- a. Give two explanations why decision making processes in networks are generally very long. (6 points)
- b. Name two ways in which a process architect can stimulate progress (speed) of these processes. Support your choices with arguments. (6 points)
- c. Name two ways in which a process manager can stimulate progress (speed) of these processes. Support your choices with arguments. (6 points)
- d. Name two risks of overemphasizing progress (speed) of decision making processes in networks. Support your choices with arguments. (6 points)