SPM4340 / SPM4340IA: Design of Innovative ICT infrastructures and Services (ICT-systems engineering)
Monday, June 28, 2010
9.00-12.00h

Answers should be formulated in English

In total 100 points can be earned for this exam

This exam has 4 questions, make sure that you answer all questions

Please, indicate which course(s) you take on your answer sheets
SPM4340 (10 EC),
SPM4340IA (6 EC),
SPM4340IA (6 EC) + SPM9610 Capita Selecta (3 EC),
SPM4341 (9 EC),

Question 1: General questions (15 points)

a) What are architectural principles? Give an example and explain the use in enterprise architecture (EA). (5)

b) What are the differences between the programme of business demands (PBD) and architectural principles? Motivate your aswer by providing an example. (5)

c) What are enterprise architecture frameworks (EAF)? Why are EAF needed? (5)

Question 2: Enterprise architecture (EA) and governance (50 points)

The IND is the organization responsible for accurately carrying out immigration and naturalization services. In order to do so, the IND has to clearly set out the rules that apply to foreign nationals in the Netherlands. The IND applies those rules as objectively and consistently as possible. IND staff examines each and every case and allow the foreign nationals to present their individual story. It gives the IND an opportunity to find a balance between rules and people. The IND has about 3000 employees distributed over various offices in the Netherlands. The main office is in Rijswijk and there are 9 locations in the Netherlands which serve as a services center. The ambition of the IND is to become more efficient and reduce the number of employees. There main administrative processes are:

1. Asylum: processing applications for asylum: listening, verifying, and deciding.
2. Naturalization: processing applications requesting Dutch nationality.
3. Managed migration: processing applications for regular residence permits to live and work in the Netherlands.
4. Court case representation: representation of the State Secretary for Justice in court cases regarding decisions taken by the IND.

Many of these processes are labor intensive. All of these processes have some steps in common like receiving requests, collecting of additional data, making of decisions, and communicating decisions. All formal communication needs to be stored to ensure that they can be retrieved as further evidence.

The IND closely collaborates with a number of public and private partners. They employ their offices, a call center and various website as service channels to interact with citizens and businesses. Most of them have their own applications and websites. One important website is http://www.newtoholland.nl/, which provides a checklist to aid migrants in identifying the relevant procedures to apply for a residence permit. Furthermore some higher education organizations serve as a service channel. All these service channels are relatively autonomous and have their own systems and business processes. There is a central database for registering information about all applicants. Regularly the IND has to update their systems and processes due to changes in legislation. The IND is introducing the concept of enterprise architecture (EA) in their organization to ensure that they are able to adapt quickly to new legislation.

a) What could be the main objectives of an EA for IND (5)?

b) What elements of EA are relevant for IND? (tip: make use of the meta-architecture framework)? (10)

c) Why is EA an art? Why is EA a science? (5)

d) What is a shared service? What are the differences with outsourcing and centralization? (5)

e) What are criteria for decomposing the case study (business) into reusable modules (shared services) (5)?

f) Decompose the IND in business modules (shared services). Explain the decomposition results using the criteria of the previous question (10).

g) Which type of governance mechanisms exist? (5)

h) Which governance mechanisms are *necessary* to manage the shared services? Explain the necessity. (5)

Question 3: Application architecture and technology (15 points)

The IND decided to adopt an event-driven service-oriented architecture (SOA) Service Oriented Architectures (SOA) and Event-Driven Service Oriented Architectures (EDSOA) are complimentary but also contrasting ways.

    a) Explain the essence of a SOA and EDSOA. Make use of a diagram to explain your answer. (5)

    b) What are the similarities and differences between SOA and EDSOA? (5)

    c) What are the business advantages of using an EDSOA within IND? Provide for each advantage a clear argumentation why it is an advantage. (5)

Question 4: Process architecture and adaptability (20 points)

The staff of IND are analyzing and modeling IND's business processes to make use of web service orchestration to create workflows. Furthermore, the IND is analyzing legislations (laws and regulations) to create knowledge rules. An example of a knowledge rule is that somebody must have a certain income to be classified as a knowledge worker.

    a) What is adaptability? What are the various dimensions of adaptability? (5)

    b) Explain what BMPN, XPDL and BPEL4WS is? Explain the relationship between these protocols. (5)

    c) Draw a system architecture for integrating the knowledge rules and business processes. Explain how adaptability can be created using the knowledge rule example. (10)