
WRITTEN EXAMINATION
FOR THE LECTURE
“E-COMMERCE”
SUMMER SEMESTER 2006
OCTOBER 19, 2006
PROF. DR. RALF MÖLLER

Name: _____

Student Id: _____

Name of curriculum: _____

Signature: _____

Please note:

1. **Check if your student Id is on the list of Ids handed out by the supervisors.**
 - (a) If your **Id is not on this list**, please **fill out a proviso**, which will be given to you by the supervisor. **You may not start the exam until you have returned the proviso to the supervisor.**
 - (b) Also **fill out the additional form** given to you by the supervisor. Please **go to the students office** which is responsible for your curriculum and **let them sign the form. Return the signed form to the STS secretary (Harburger Schloßstr. 20, 2nd floor, Frau Hantschmann).**
2. Put your student identification card as well as your passport on the table.
3. You have **90 minutes** for answering the questions. **Additional resources are not allowed.**
4. The symbol “⊖” gives an advice on how much minutes to spend for answering a question.
5. There is sufficient space for your solutions on the examination sheets.
6. If you receive **additional pieces of paper** from the supervisor, please write your name and student Id also on these pages, and add a page number.
7. If you **need to leave the examination room**, silently **inform the supervisors. Do not leave your table.** Wait until the **supervisor approaches your desk and gives you the permission to leave the room.** There may be only one person away.

1. Explain the e-commerce notions disintermediation and reintermediation.



2. One of the most successful e-commerce business models is the advertisement model. Explain this model and give an explanation about why this model can be effective either if one can ensure high traffic or may exploit dedicated knowledge about users.



11



3. For generalized portals, high-volume traffic is important. How can a company running such a portal “create” high-volume traffic? Name at least three ideas and explain why (how) they would generate traffic.

4. For the description of services that are offered via electronic means we have used description logics. Let us assume, we have a Tbox with the following axioms.

$$\text{Dual_Core_Processor} \sqsubseteq \text{Processor}$$

$$\text{Single_Core_Processor} \sqsubseteq \text{Processor}$$

$$\text{Processor} \sqsubseteq \text{Dual_Core_Processor} \sqcup \text{Single_Core_Processor}$$

$$\text{Dual_Core_Processor} \sqsubseteq \neg \text{Single_Core_Processor}$$

$$\text{Computer} \sqsubseteq$$

$$\text{Technical_Device}$$

$$\sqcap \forall \text{has_part}.\text{Technical_Device}$$

$$\sqcap \exists \text{has_part}.\text{Processor}$$

$$\text{Dual_Core_Computer} \equiv$$

$$\text{Computer} \sqcap \exists \text{has_part}.\text{Dual_Core_Processor}$$

- (a) Define what it means that a concept C subsumes a concept D with respect to a Tbox \mathcal{T} .

- (b) Is the concept Computer subsumed by the concept $\exists_{\geq 1} \text{has_part}.\text{Technical_Device}$? If yes, explain why. If no, specify an axiom to be added to the Tbox such that this is the case.

4. (c) Can there be a *Dual_Core_Computer* with a *Single_Core_Processor* as a part, i.e., is the concept $Dual_Core_Processor \sqcap \exists has_part.Single_Core_Processor$ satisfiable? Justify your answer.



- (d) Can there be an instance of *Computer* $\sqcap (\exists_{\leq 1} has_part.Processor) \sqcap (\exists has_part.Dual_Core_Processor) \sqcap (\exists has_part.Single_Core_Processor)$. Give an explanation for your answer.

- (e) Specify a model of the concept $Technical_Device \sqcap \forall has_part.(Dual_Core_Processor \sqcap Single_Core_Processor)$.

5. Web services:

- (a) Suppose you are seller for computers and parts and want to offer a “Computers and Parts Price Lookup” service on the web.

What do you need to do in order to enable others to make use of your service? Name and briefly describe the involved steps.



14



- (b) Draw a diagram illustrating the roles of the WebServer Provider and of the WebService Requester. What other parties can be present and what is the corresponding role of the other parties?

6. Web services can be described using description logic Tboxes, and service matching can be formalized by description logic decision problems. Name at least three ways to define a function $match(S_r, S_p)$ to be applied to a concept for a service request S_r and a concept for a service provider S_p (for S_r and S_p there are axioms in a Tbox). Specify for which purpose each formalization is best suited.



10



7. Let us assume, there is a service request S_r described by the following axiom (as an ontological assumption let $from$ specify the origin of the shipping action):

$$S_r \equiv Shipping \sqcap \exists from.(Plymouth \sqcup Dublin)$$

Assume we have the following Tbox encoding background knowledge:

$$Shipping \sqsubseteq (\exists_{\geq 1} from) \sqcap (\exists_{\leq 1} from)$$

$$(Plymouth \sqcup Dublin) \sqsubseteq UKCity$$

In a repository there are two descriptions for service providers:

$$S_{p_1} \equiv Shipping \sqcap \exists from.UKCity$$

$$S_{p_2} \equiv Shipping \sqcap \exists from.USCity$$

- (a) If satisfiability of the request S_r conjoined to a provider description S_p were used to indicate a match, i.e., if satisfiability of $S_r \sqcap S_{p_1}$ and $S_r \sqcap S_{p_2}$ were determined, what would be the result of the matching function and why?
- (b) Do you think the result is useful from a practical point of view? Justify your answer.

7. (c) Add an axiom to the Tbox such that $S_r \sqcap S_{p_2}$ is not satisfiable and hence S_{p_2} does not match. Explain what the effect of the added axiom is.



14



- (d) Does there exist a model of $S_r \sqcap UKCity$? Justify your answer.

8. (a) Consider the 4-phase transaction model for B2B and B2C transactions. What is the primary difference?



11



- (b) Reconsider service matching as satisfiability of the service request and service provider concepts $S_r \sqcap S_p$ (together with a Tbox with definitions for S_r and S_p). In which phase would you apply the match function? Why?

- (c) If matching were formalized as satisfiability of $S_r \sqcap S_p$, how could we formalize the degree of match? Explain.