

Exercise
Business Informatics 2 (PWIN)
Winter Term 2025

Exercise IV:
Management of IT Projects &
Software Engineering

Fachbereich
Wirtschaftswissenschaften

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The InstaMatch scenario is required in order to solve some of exercises. It can be found in a separate document.

Management of IT Projects

Exercise 1: IT Project Management

Explain what is meant by ‘magic triangle of project management’.

Exercise 2: IT Project Management

What are the ‘SMART’ project objectives? Explain them at the example of the InstaMatch Service.

Exercise 3: Network Plan and Gantt Chart

The project manager of a software company wants you to prepare a network plan for an upcoming software development project. His assistant has gathered the activity time estimates and their dependencies shown below.

Activity ID	Activity Description	Duration (days)	Preceding Activities
A	Feasibility Analysis	4	-
B	Requirements Engineering	7	{A}
C	Documentation	32	{B}
D	Hardware Procurement	3	{B}
E	Implementation	40	{D, F}
F	Architectural Design	5	{B}
G	Testing	28	{D, F}
H	Software Delivery	5	{C, E, G}

- a) Build a network plan according to the following schema and determine the critical path using activity slack calculations. Estimate how long the project will take.

Activity Description		
Earliest start time	Duration	Earliest end time
Latest start time	Slack time	Latest end time

- b) How long can activity “D: Hardware Procurement” be delayed?
- c) Because of some internal problems with the procurement process, the project manager now expects activity D to require 12 days. Rebuild the network plan, highlight the critical path and describe the impact on the project schedule.
- d) The project manager now asks you to develop a Gantt chart based on the updated network plan.
- e) How could you improve the visualisation of Gantt charts?

Software Engineering

Exercise 4: Software Development Process Models

Name and describe three software development process models and select one of them for the InstaMatch Service. Motivate your choice.

Markup Languages

Exercise 5: Well-formed XML Documents

- a) What is meant by “well-formed XML document”?
- b) Indicate which of the following XML documents are well-formed? Mark the mistakes and correct them.

<pre><?xml version="1.0"?> <User id="194"> <Pseudonym> Jenny23 </Pseudonym> <Mobile_Operator> t-mobile </Mobile_Operator> <Registration> 03.02.2020 </Registration> <Lastlogin> 29.04.2020 </Lastlogin> </User></pre>	<pre><?xml version="1.0"?> <User id=203> <Pseudonym> Joe1976 </Pseudonym> <Mobile_Operator> vodafone </Mobile_Operator> <Registration> 06.02.2020 <Lastlogin> 31.04.2020 </User></pre>
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<pre> <?xml version="1.0"?> <Date> <Places> An der Hauptwache 7 </Place> <Time> 25.03.2020, 21:15- 0:15 </Time> <Meeting_Point> Starbucks <People> Gina </Meeting_Point> </People> <People> Jimmy </People> <Activitiy> Drinking Cocktails </Activitiy> <Comment> Spend Gina 2 Caipis </Comment> </pre>	<pre> <?xml version="1.0"?> <Date> <Place> Theodor-W.-Andorno- Platz 5 </Place> <Time> 25.03.2020, 16:15- 19:15 </Time> <Meeting_Point> Sturm und Drang </Meeting_Point> <People> Joe1976 </People> <People> Jenny23 </People> <Activitiy> Drinking Beer </Activitiy> <Comment> Joe1976 wears sun glasses! </Comment> </Date> </pre>
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c) Explain why the following XML document is not well-formed. Correct the syntax error.

```

<?xml version="1.0"?>
<User id="203">
  <Sex>
    Male
  </Sex>
  <Age>
    21
  </Age>
</User>
<User id="194">
  <Sex>
    Female
  </Sex>
  <Age>
    23
  </Age>
</User>

```

- d) Create an XML document representing your two favorite dating locations. Use at least two different tags for describing the locations and at least one attribute.

Exercise 6: Document Type Definition (DTD)

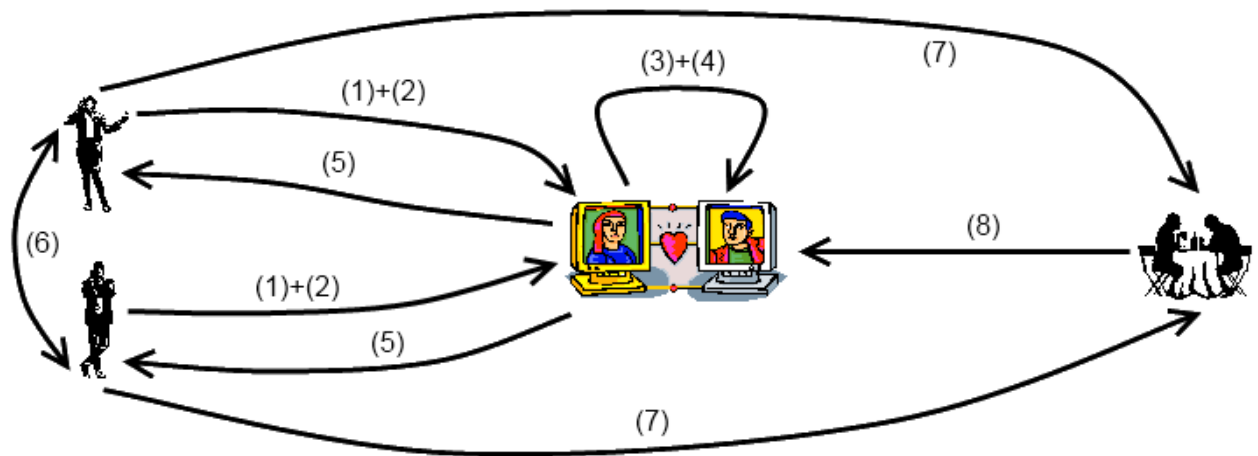
- a) Create a DTD for the XML document from exercise 1 b).
 b) Validate and correct the following XML document against the corresponding DTD document. Assume the given DTD is correct.

<pre> <Student> <Name>Guenther M</Name> <Address> <Street>Cluestreet <ZipCode>63743</ZipCode> </Address> <City>Berlin</City> <Age>23</Age> <Gender>male</male> <Course>Scientific Work</Course> <Course>Economics</Course> <Event>Networking</Event> </Student> </pre>	<pre> <!DOCTYPE Student [<!ELEMENT Student (Name, Ad- dress, Age, Gender, Course*, Subject*)> <!ELEMENT Name (#PCDATA)> <!ELEMENT Address (Street, ZipCode, City)> <!ELEMENT Street (#PCDATA)> <!ELEMENT ZipCode (#PCDATA)> <!ELEMENT City (#PCDATA)> <!ELEMENT Age (#PCDATA)> <!ELEMENT Gender (#PCDATA)> <!ELEMENT Course (#PCDATA)> <!ELEMENT Subject (#PCDATA)>]> </pre>
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Unified Modeling Language

Exercise 7: UML

- a) What are the differences between use case and activity diagrams?
 b) Develop a use case diagram and an activity diagram for the InstaMatch[®] service based on the Figure 1 below:



- (1) Users register at InstaMatch[®]. Thereby, they receive their pseudonyms and submit their personal profile information. Subsequently, InstaMatch[®] attempts to certify the profile attributes of the users.
- (2) In order to start searching for a date, users have to activate the InstaMatch[®] app on their mobile device.
- (3) InstaMatch[®] attempts to find other InstaMatch[®] users in close proximity who are also currently looking for a date.
- (4) InstaMatch[®] matches the personal profiles of all users in close proximity with each other.
- (5) If there is a match, InstaMatch[®] informs the corresponding users by presenting them with a list of matching pseudonyms.
- (6) InstaMatch[®] enables matching users to communicate with each other using text messages, chat or voice.
- (7) If users want to arrange a meeting, InstaMatch[®] suggests a list of appropriate meeting points based on the personal interests of the corresponding users as well as their current geographic location. Then, InstaMatch[®] navigates the users to their meeting point.
- (8) After the date, the users can rate their date on the InstaMatch[®] app. This rating is used to improve their next date matching process.