FAKULTÄT FÜR BETRIEBSWIRTSCHAFTSLEHRE
Lehrstuhl für ABWL und Wirtschaftsinformatik
Prof. Dr. Armin Heinzl

UNIVERSITÄT MANNHEIM

L15, 1-6
68161 Mannheim

Telefon 06 21 / 1 81-1691
Telefax 06 21 / 1 81-1692

wifo1@uni-mannheim.de
http://wifo1.bwl.uni-mannheim.de

Mannheim, June 6, 2014

Spring term 2014

„IS 510 Process Management“

Name and first name:	_____
Course of study:	_____
Final degree:	Master ☐ Diploma ☐ Bachelor ☐ Other ☐
Stud.-#:	_____
Room and place#:	_____
Signature:	_____

Important remarks:

- The exam assignment is provided in English!
- You may answer in English **or** German!
- Select **one task out of two!**
- Time budget: **60 minutes (+ 5 minutes reading)**
- Please acknowledge time budget distribution over questions as indicated!
- Auxiliary devices: anything, except notebook computers, PDAs and cell phones

Task 1

The AHA GmbH, a mid-sized company in the heating technologies sector, specializing in after sales service, has hired you to analyze their service order process. After two decades in the industry, the company has grown to 8 employees of which 5 are working in field services and 3 in the office. You are tasked with the service request scheduling process. After the incoming service request has arrived, customer information from the CRM System is checked together with the identification of the service request. The service request can be either "heating defect" or "maintenance request". Although seldom, some customers report a defect and request maintenance simultaneously. If a heating defect has been determined, a possible service technician is identified. After that, an appointment is scheduled between the technician and the customer with the help of paper calendars. If a maintenance request has been determined, the assistant looks up if a service contract exists in the paper based contract folders. If no contract exists, a service contract is setup and then sent to the customer. After the contract lookup, the season is checked. If it currently is winter, the appointment is postponed to summer and a reminder is setup to call the customer back in the summer ending this process branch. If it is summer, then an appointment is scheduled between the technician and the customer with the help of paper calendars. For all requests, a service order is entered into the ERP system as a next step. Then this service order is transmitted from the ERP to the technician via mobile data link. Finally, the technician is called to notify him of a new service order and appointment he has to drive to.

a) Model this process as an extended EPC (eEPC) according to existing eEPC rules. Please include information objects, organizational units and application systems if applicable.

(15 minutes)

b) Transform the designed eEPC into a P/T net according to existing design rules.

(15 minutes)

c) The company's general manager has gained first insights into workflow management systems, but has some open questions.

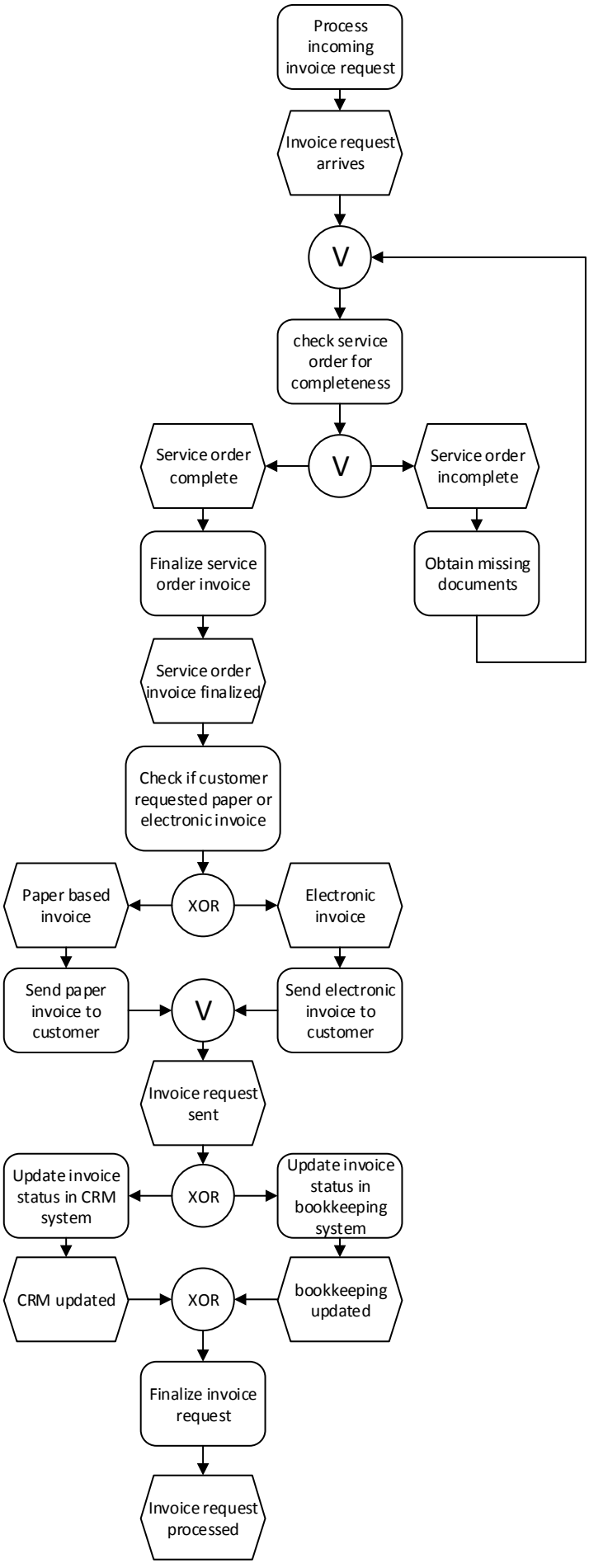
1. Please give him a short introduction into the different categories of workflows and workflow systems.
2. What are the advantages of separating the process and application layer in the workflow system?
3. Would you recommend the introduction of a workflow management system in his company? Please elaborate on your recommendation.

(15 minutes)

d) A previous consultant left behind an EPC of the invoice request process (see next page). Please identify mistakes, state the reason of the mistake and suggest a correction.

(15 minutes)

Good luck!


Process incoming invoice request
Invoice request arrives
V
check service order for completeness
Service order complete
V
Service order incomplete
Finalize service order invoice
Obtain missing documents
Service order invoice finalized
Check if customer requested paper or electronic invoice
Paper based invoice
XOR
Electronic invoice
Send paper invoice to customer
V
Send electronic invoice to customer
Invoice request sent
Update invoice status in CRM system
XOR
Update invoice status in bookkeeping system
CRM updated
XOR
bookkeeping updated
Finalize invoice request
Invoice request processed

Task 2

The AHA GmbH, a mid-sized company in the heating technologies sector, specializing in after sales service, has hired you to analyze their service order process. You are tasked with the service request scheduling process (SRVSCH). During the 8 hours the one office assistant accepts service requests, these arrive equally distributed between 6 and 12 minutes apart. The assistant (ASSIST) needs between 1 and 7 minutes (equally distributed) to record the service request. 80% of the calls are requests concerning a "heating defect", the rest are requests for a maintenance appointment. The "heating defect" requests need to be assigned to a technician by the assistant (ASSIST), which takes between 0 and 2 minutes (equally distributed). 75% of the maintenance appointment requests are from customers who already have a maintenance contract, for the other 25% a contract needs to be setup, which takes the assistant (ASSIST) 12±4 minutes (equally distributed). After this, all requests need to be scheduled, for which the assistant (ASSIST) needs between 1 and 5 minutes (equally distributed). The request scheduling process is then completed.

a) Model this situation as a GPSS model that has all details about the waiting queue and the time that applications spend in the process as output. Please use the names in brackets as identifiers for the modeling symbols.

(20 minutes)

b) Your GPSS program has yielded the following results:

Facility	(1) Average utilization	(2) Number of entries	(3) Average time/trans
ASSIST	87.03	138	3.03

Result: Stations

Queue or AD set	(1) Maximum contents	(2) Average contents	(3) Total entries	(4) Zero entries	(5) Percent zeros
SRVSCH	3	1.29	52	0	0.00
ASSIST	3	0.42	139	78	56.12

Queue or AD set	(6) Average time/trans	(7) $Average time/trans	(8) Current contents
SRVSCH	11.94	11.94	2
ASSIST	1.46	3.33	1

$Average time/trans=average time/trans excluding zero entries

Result: Queue/AD

Table SRVSCH

(1) Entries	(2) Mean AD set time	(3) St. dev.	(4) Total time	(5) Minimum	(6) Maximum
50	12.06	5.65	602.94	4.43	22.48

Range	Observed frequency	Per cent of total	Cumulative percentage	Cumulative remainder
- 0	0	0.00	0.00	100.00
0.01 - 1	0	0.00	0.00	100.00
1.01 - 2	0	0.00	0.00	100.00
2.01 - 3	0	0.00	0.00	100.00
3.01 - 4	0	0.00	0.00	100.00
4.01 - 5	2	4.00	4.00	96.00
5.01 - 6	6	12.00	16.00	84.00
6.01 - 7	2	4.00	20.00	80.00
7.01 - 8	4	8.00	28.00	72.00
8.01 - 9	4	8.00	36.00	64.00
9.01 - 10	6	12.00	48.00	52.00
10.01 - 11	2	4.00	52.00	48.00
11.01 - 12	5	10.00	62.00	38.00
12.01 - 13	2	4.00	66.00	34.00
13.01 - 14	1	2.00	68.00	32.00
14.01 - 15	0	0.00	68.00	32.00
15.01 - 16	2	4.00	72.00	28.00
16.01 - 17	0	0.00	72.00	28.00
17.01 - 18	0	0.00	72.00	28.00
18.01 - 19	5	10.00	82.00	18.00
Overflow	9	18.00	100.00	0.00

(7) Average value of overflow 20.87

Result: Tables

The general manager wants to know what to expect from their current service request scheduling process and would like to have following questions answered:

1. How many service requests were completely processed during work hours?
2. How many requests spent more than 5 minutes and up to 10 minutes in this process?
3. What was the mean time to fully process a service request?
4. How many requests arrived during work hours?
5. What was the minimum time an application spent in the process?
6. How can the total processing speed of requests be increased? How can this be modeled in GPSS? Give two examples.

(10 minutes)

c) The companies general manager has gained first insights into workflow management systems, but has some open questions.

1. Please give him a short introduction into the different categories of workflows and workflow systems.
2. What are the advantages of separating the process and application layer in the workflow system?
1. Would you recommend the introduction of a workflow management system in his company? Please elaborate on your recommendation.

(15 minutes)

d) A colleague of yours suggests a Queuing Theory approach for quantitative process analysis. Which are suitable purposes for Queuing Theory and Simulation? Please elaborate shortly.

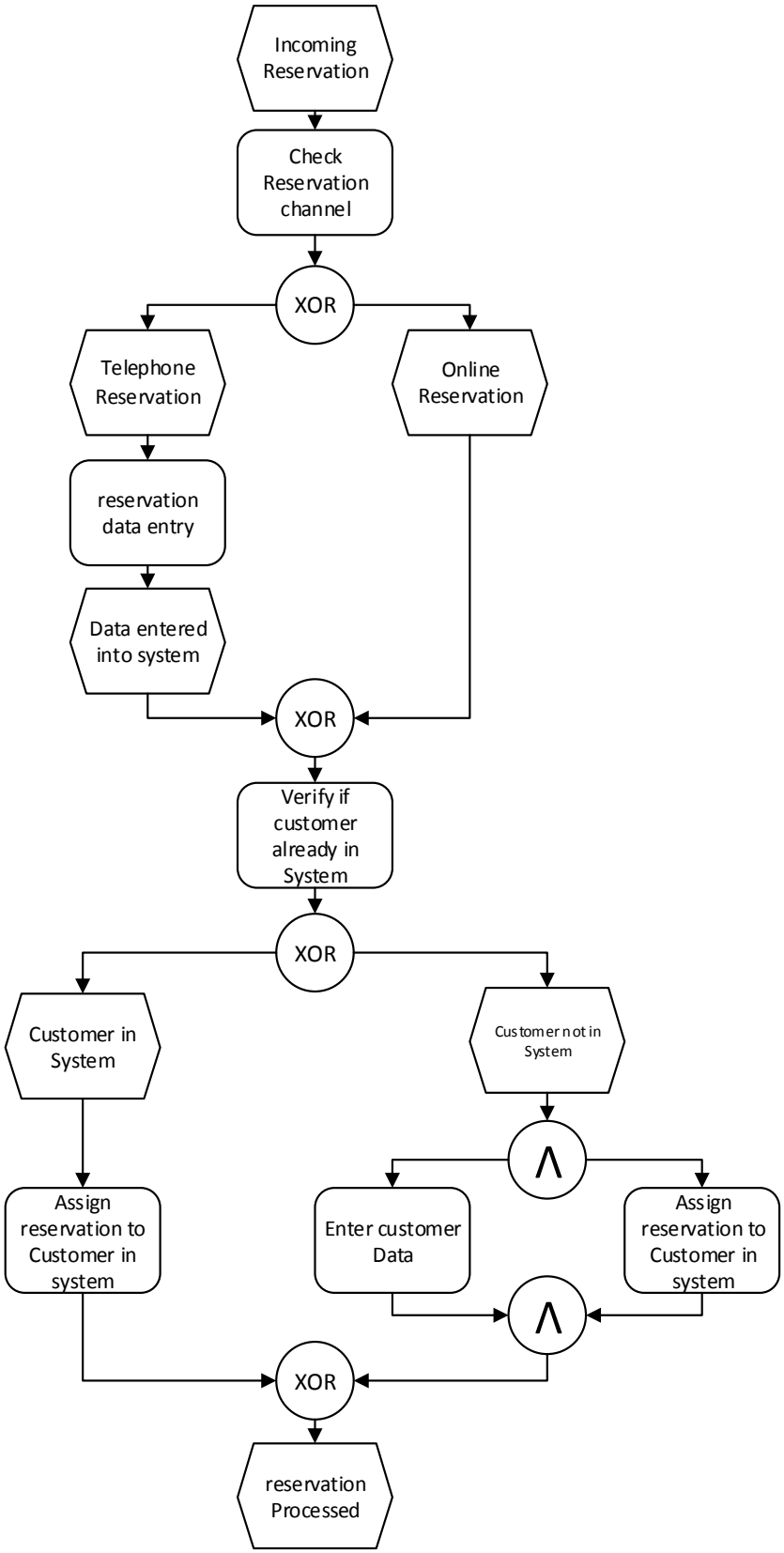
(5 minutes)

e) Another client of yours, a rental car company, has structured their reservation process as indicated on the following page.

This process has previously been modeled as an EPC. Please transform the presented EPC on the following page into a P/T net according to existing design rules.

(10 minutes)

Good luck!


Incoming Reservation
Check Reservation channel
XOR
Telephone Reservation
Online Reservation
reservation data entry
Data entered into system
XOR
Verify if customer already in System
XOR
Customer in System
Customer not in System
Λ
Assign reservation to Customer in system
Enter customer Data
Assign reservation to Customer in system
Λ
XOR
reservation Processed