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Information Systems 01PDWOV

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Books, notes are not allowed. Write only on these sheets.

New water connection for a new building.
The company WATER manages an aqueduct and water supply in a certain region.
An important process is the start of a new contract for a new building. In this case not only a water meter has to be installed, but also a new physical connection between the main water pipe of the building and the aqueduct has to be developed. The connection may be very expensive depending on the distance between the existing aqueduct and the building.

The current process (AS IS), is as follows.
The owner of the new building asks for a new contract and a new connection to the building. The request is written on a paper form that is sent to the commercial office of WATER.
The commercial office opens a dossier for the case, using the internal ERP system, assigns to it an internal ID. The commercial office sends the dossier to the technical office. The technical office receives the dossier, and schedules an appointment to visit the building. After the visit the technical office defines an estimate of the amount of work and resources needed to do the connection, and sends it to the commercial office. The commercial office prepares: an offer, containing the cost to be paid for the connection, and an estimate of when it could be ready; and a contract for water supply; and sends all to the building owner, by mail.
At this point the building owner can decide to accept the offer, or not.
In case of acceptance the building owner signs the contract and returns it to WATER. Then he or she has also to pay an amount defined in the contract to make the contract effective.
The commercial office receives the contract signed. When the accounting office receives the payment then it signals it to the commercial office. The commercial office contacts then the technical office that will in its turn contact the customer to agree when the connection will be made.
After the connection is made the water supply can start.
The process is typically slow, taking often months to complete, even if the actual work to do the connection is in the order of days or hours. Besides, typical issues are stuck dossiers because of mismatches between its parts (for instance payment vs dossier).
In the following model a TO BE situation that should be paperless and as effective (especially as fast) as possible. Feel free to reasonably modify the new process to improve it.

1 IT Model / Technological model: describe the hardware architecture of the system

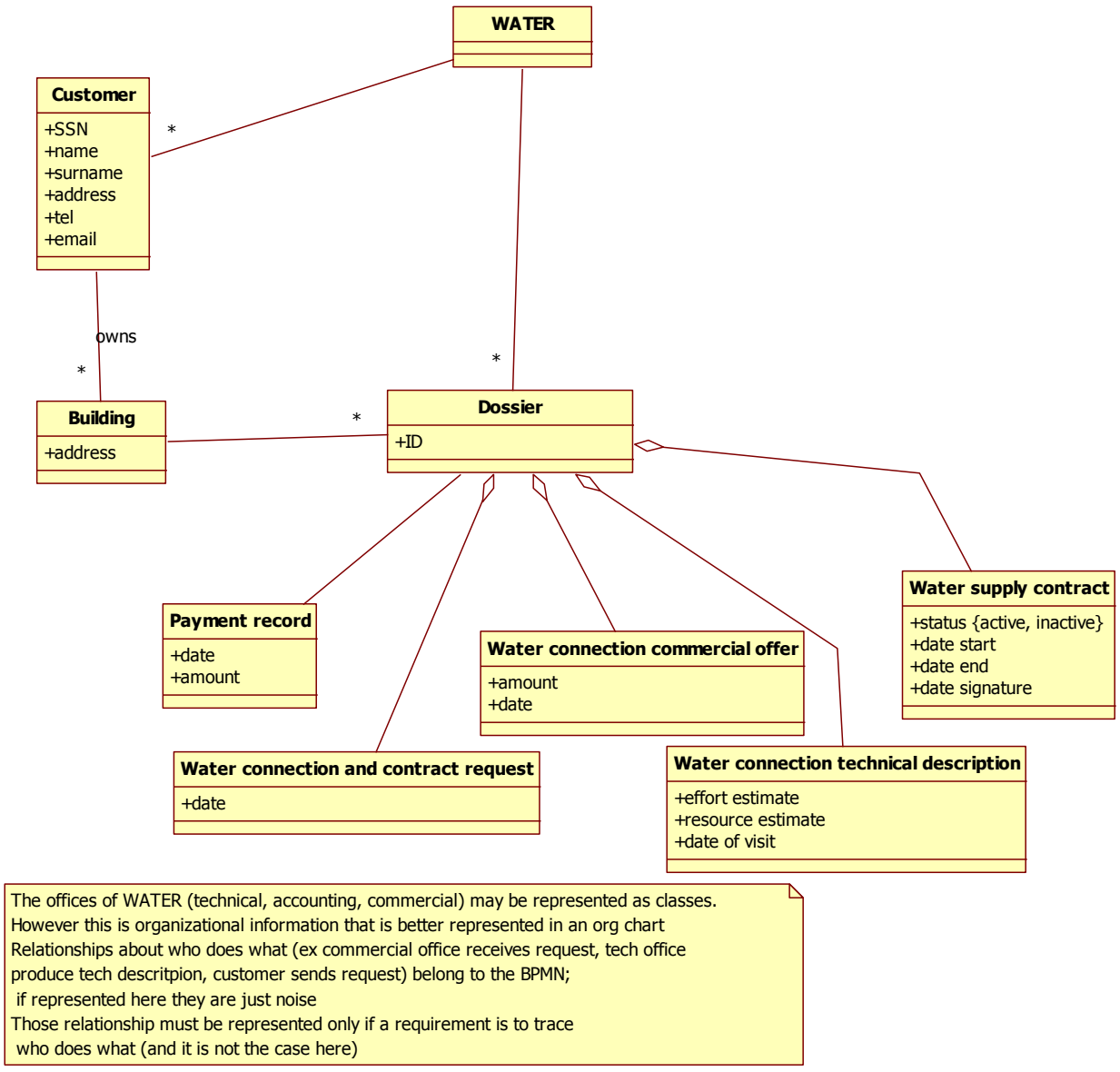
Client: PC for WATER employees, PC/Smartphone for customers
Server: web / application / data server for WATER

2 Organizational model: list roles or organizational units involved
WATER: commercial office, technical office, accounting office
Customer

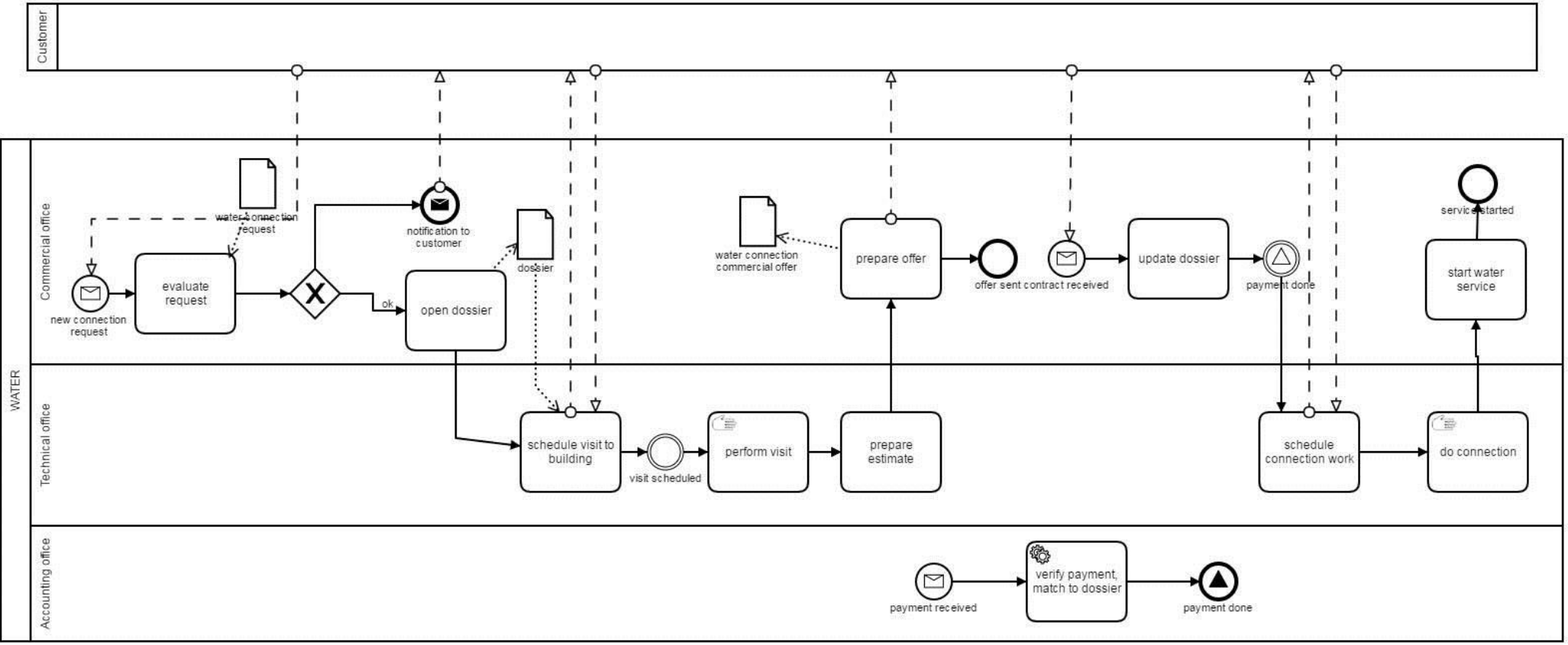
3 Business rule: write (in plain English, or in pseudocode) a business rule at your choice from the process described above.

The person who asks a water connection must own the building
Discount on commercial offer <= 10%
Connection starts after payment
Contract starts after connection

4 Functional model: Design and model (using BPMN + UML class diagram) the process (subdividing it as needed in subprocesses)



The BPMN process below is quite similar to the AS IS situation, just some activities have been automated (submission of request is made via web site and not on paper, the dossier is digital). Another key point is the activity to match payment and dossier, that is automated too.
These changes should improve the process.
Another option is to have the technical office receive the request of connection and open the dossier. This avoids one transmission of the dossier from commercial to technical office.
A bolder change (not in the BPMN below) is to merge technical and commercial office. This change of course implies political issues to be solved inside WATER.


Customer
WATER
Commercial office
Technical office
Accounting office
water connection request
new connection request
evaluate request
ok
notification to customer
open dossier
dossier
water connection commercial offer
prepare offer
offer sent
contract received
update dossier
payment done
service started
start water service
schedule visit to building
visit scheduled
perform visit
prepare estimate
schedule connection work
do connection
payment received
verify payment, match to dossier
payment done

5 Define the KPIs, considering these high level business goals (or CSF), CSF1 increase customer satisfaction, CSF2 reduce the cost of the process. In the table below show the correspondence CSF – KPI

CSF name	KPI Category (General, cost ..)	KPI Name	KPI Description	Unit of measure
	General	NR	Number of new connection requests per year	
		NC	Number of new connections (and contracts) implemented per year (remark in this case probably NC < NR)	
		NE	Number of employees involved in administrative work relative to the process	
CSF2	Efficiency	UC	Unit cost to manage a connection request (Must not include cost to implement physically the connection, this is not an administrative activity that IT can modify)	euro
CSF1		EC	Effort of customer to handle the process (submit request, manage visits, payment, contract)	Hours
CSF1	Service	LT1	From new connection request to visit scheduled (see BPMN events)	Calendar days
CSF1		LT2	From contract received to service started (see BPMN events)	Calendar days
CSF1, CSF2	Quality	E	Connection requests with errors /NR Possible errors: wrong customer data, misunderstandings in visit appointments, payments not matched to dossiers, lost dossiers	%

6 Compare the previous and the current situation, using the KPIs defined above

KPI	AS IS	TO BE
NR		Probably no change (monopolistic service)
NC		Same as for NR
UC		Should be less. IT infrastructure is a new cost, but personnel cost decreases.
EC		Should be considerably less, interaction via web and not physical
LT1		Possibly less, but most of LT depends on schedules of the technical office. Besides, availability of the customer is also a factor that can increase LT1, and is not under control of WATER
LT2		Same as for LT1
E		Should decrease substantially, no manual data entry, no paper dossiers to be lost.

Define the TCO to shift to the TO BE situation

Phase	Cost
Construction C	Development of new IT infrastructure (web portal)
Deployment D	Deployment of functions of IT portal, training of employees
Operation maintenance OM	Hardware infrastructure operation and maintenance, web application operation and maintenance (for one year)
Dismissal DS	Uninstall web app, Data porting to new future IT infrastructure

7 Considering a 5 years period, define costs and savings (ROI analysis) by adopting the TO BE situation

Year/ cost or saving	Year 1	Year2	Year3	Year4	Year5
Cost	C+D				
Cost	OM	OM	OM	OM	OM
Saving	S	S	S	S	S

Assuming no dismissal after 5 years
TCO = C+D+5*OM
Cost_infrastructure _per year = TCO/nyears to be used == 5
S = (Cost_personnel_after -cost_personnel_before) + cost paper-ink

UC_before= (cost_personnel_before + cost paper-ink)/NR
UC_after = (cost_personnel_after + cost_infrastructure_per_year)/NR
Cost_personnel_after < cost_personnel_before to have savings

9 Considering the KPIs and the ROI, is the TO BE situation better? (answer Yes or No):

Why?
Yes

The main winner is the customer, with an important reduction of EC
LT1 and LT2 may or may not be reduced, since they include parts not directly under the control of WATER, and physical works not influenced by IT
E should decrease, with indirect positive effect on UC and customer satisfaction
There is an initial investment in IT (C+D), besides yearly costs (OM), but they should be recovered the faster, the higher is (Cost_personnel_after -cost_personnel_before)

10 What are the key factors to consider in the decision about outsourcing an IT activity?

The activity is a commodity vs is specific
The activity is related to a competitive advantage for the organization or not
The activity manages sensitive data or not
The activity can be described precisely and controlled (ie it is possible to define effective SLAs)
Lock in is avoidable (there are more vendors for the activity and switching is feasible)
Cost and quality – cost should include visible (search, negotiation, contract) and especially hidden costs
The organization can loose the know how regarding the activity (and possibly regain it in case of insourcing back later)

11 The WATER company uses a module of an ERP package to manage technical activities (planning and monitoring of water connection jobs). Discuss if this decision makes sense or not

Using an ERP is an outsourcing decision (support for technical activities is made through a package acquired outside, and not built internally)
The decision makes sense. The activity is not strategic, not unique, is a commodity, data is not sensitive

12 Describe the multi side business model, and provide an example of it.

See slides

13 The WATER company covers the Piedmont region. It has one technical office and one commercial office in each province of Piedmont. Headquarters, HR, accounting and IT are in Turin. What kind of organizational structure is this?

Functional (headquarters, HR, accounting IT) + geographic (tech + commercial offices)

14 Describe the 'Service desk' according to ITIL v3,

See slides