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Information Systems 01PDWOV

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

Thesis management in university. A thesis is a project made by a student under the supervision of a university teacher. Thesis management requires many steps.
First a teacher publishes a call for thesis. The thesis has a title, a description, a number of credits attached, a minimum duration. Students can access the list of theses published, inquire about them interacting with the teacher.
When teacher and student agree, and if the student can (rule: student has earned already a certain amount of credits) a student officially starts the thesis. This step must be recorded officially by the administration (thesis title is attached to a certain student, and start day is recorded).
The next step is end of thesis. The student asks to end the thesis. If the teacher approves (rule: number of credits earned >= number of credits of the thesis work && teacher approves work) administration records end of thesis, the students earns the credits attached to the thesis; the student also has to deliver a report about the thesis.
Finally is the defense of thesis, and acquisition of degree. The student asks to the administration to graduate in a certain session. The administration possibly agrees (rules: student has enough credits for graduation, has completed thesis, has delivered report, has paid a fee; the deadline to graduate for the session selected is not passed yet).

In the AS IS situation. Theses are published on a web portal. Start of thesis is managed via a paper form, with data about student, about thesis, signature of student and teacher. End of thesis is managed similarly via a paper form. The thesis is delivered as a paper document. Request to graduate is also managed via a paper form.
In the TO BE situation. Theses are published on a web portal (no change). Start of thesis, end of thesis, request to graduate are all managed through a web portal. Teachers receive an email to notify a student request, and then log in the web portal to manage it. Administration constantly accesses the web portal to manage all requests. The thesis is delivered as an electronic document in a standardized format (ex PDF) and uploaded on the same web portal.
In the following, model the TO BE situation.

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

Client: PC for administration, PC /smartphone for teacher/student
Server: web server, db server

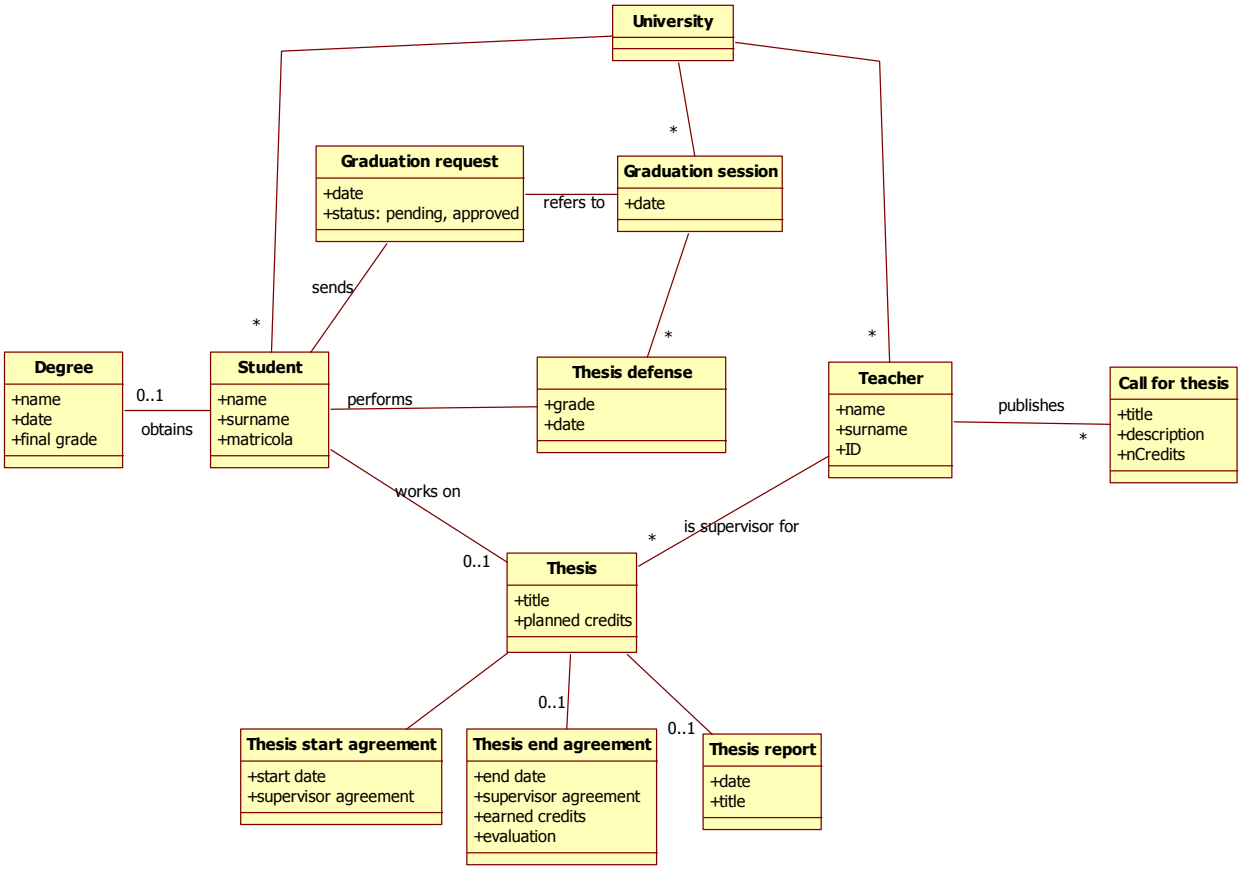
2 Organizational model: list roles or organizational units involved

Student, teacher, administration (possibly also banking role for the payments)

Note: Technological systems (email gateway, web portal) are NOT organizational roles

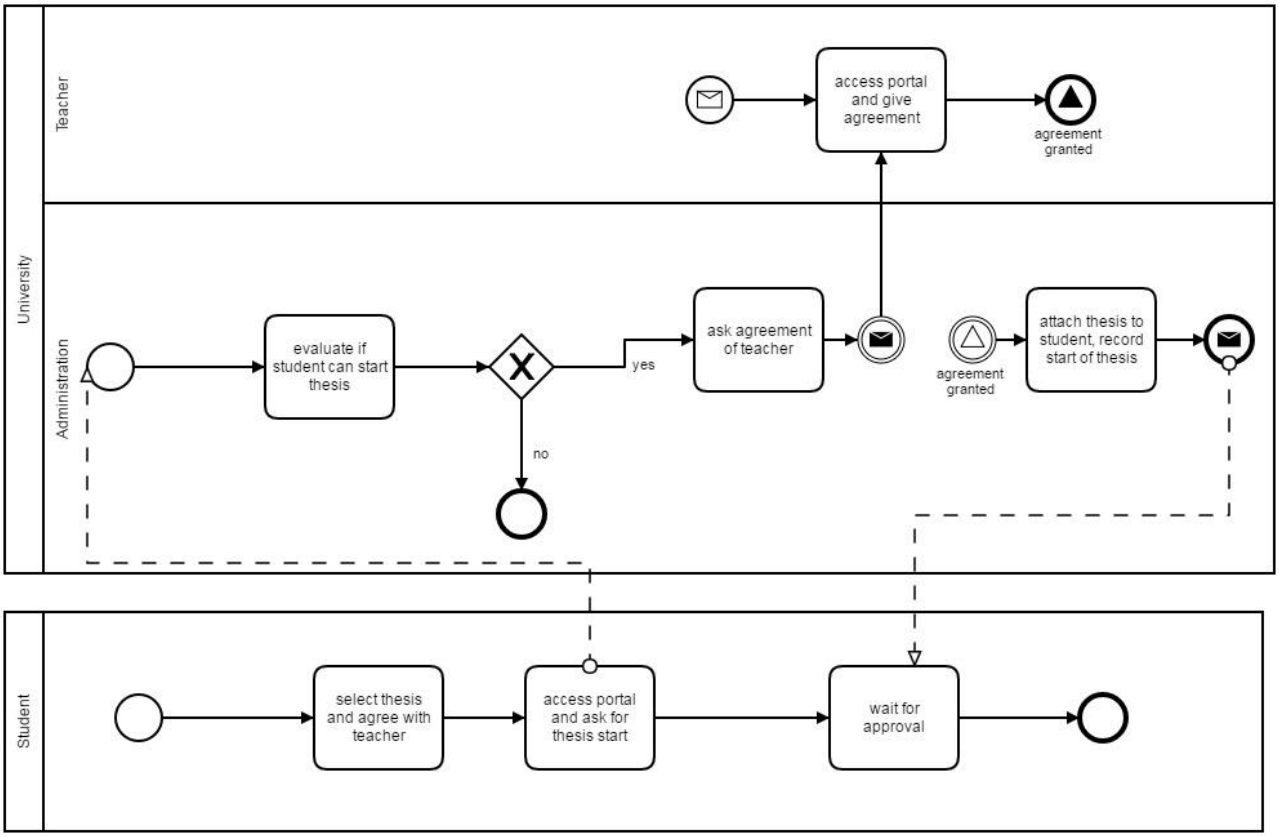
3 Functional model: Design and model (using UML activity diagrams with swimlanes + class diagram) the process (subdividing it as needed in subprocesses)

Most common mistakes:
Administration as a class is not needed (if University class is defined)
'List of' class (List of students, list of thesis, etc) is a mistake (is an implementation class that does not belong to a conceptual diagram)
Classes are models so their name is typically singular (Student, not Students)
Also 'Web portal', 'web server' or similar are implementation classes
Missing classes about key events (Graduation request) or periods (Graduation session)

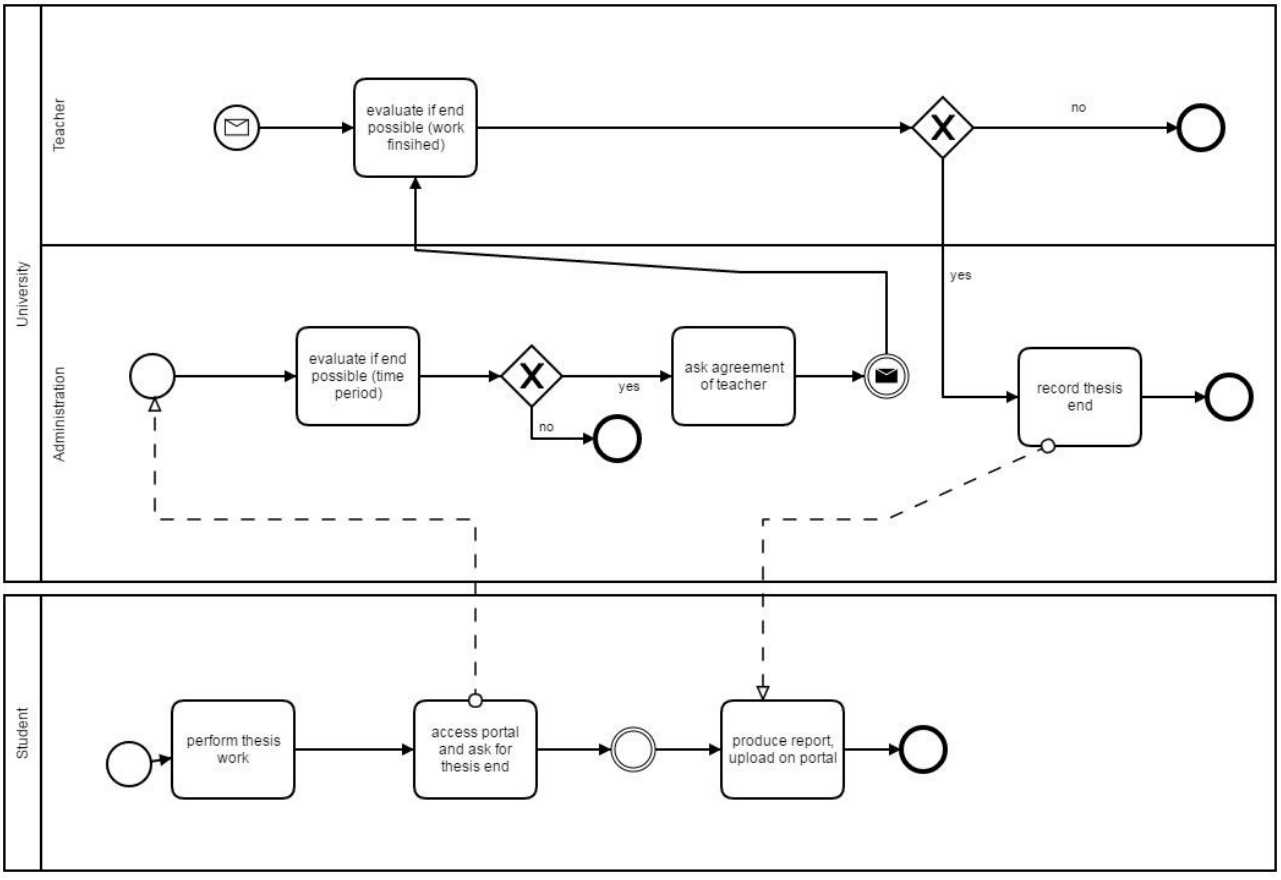


Important subprocesses

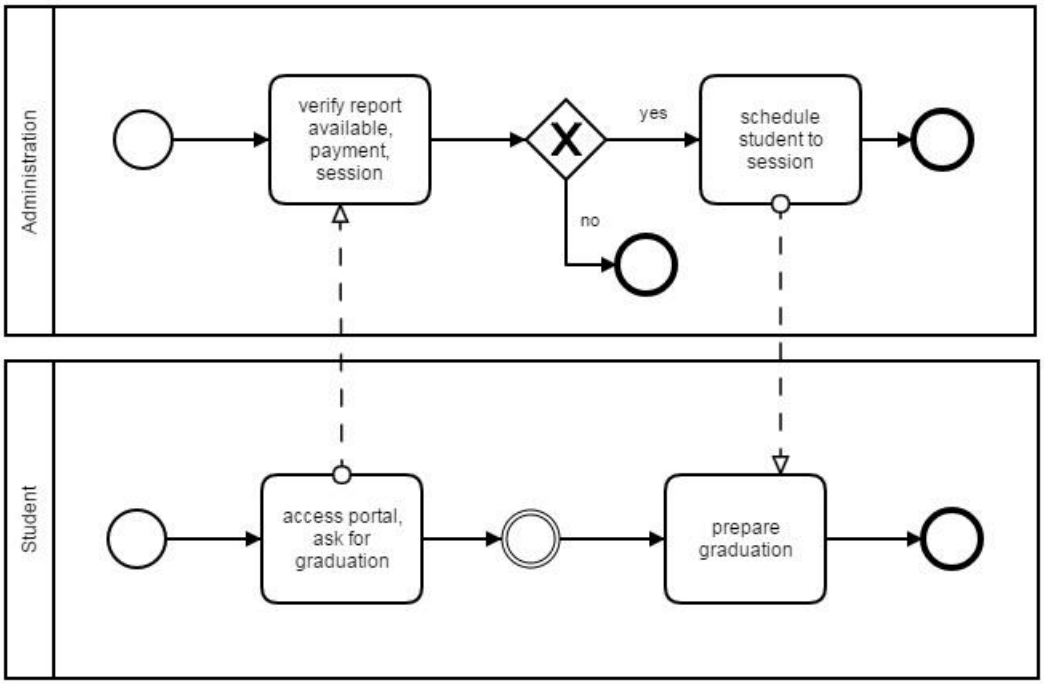
Start of thesis



End of thesis



Graduation


Administration
verify report available, payment, session
yes
schedule student to session
no
Student
access portal, ask for graduation
prepare graduation

4 Define the KPIs, considering these high level business goals (or CSF), CSF1 increase student satisfaction, CSF2 minimize cost of the thesis management process. In the table below show the correspondence CSF – KPI

CSF name	KPI Category (General, cost ..)	KPI Name	KPI Description	Unit of measure
	General	NT	Number of thesis started per year	
CSF2	efficiency	UC	Unit cost to manage one thesis = (effort administration*hour cost admin + effort teacher *hour cost teacher + cost infrastructure) /NT Effort: in human activities defined in BPMN Cost $infrastructure_{asis}$ = web portal, paper forms Cost $infrastructure_{tobe}$ = web portal extended	Euro
CSF1	Service	LT1	Lead time start thesis process	t
CSF1		LT2	Lead time end thesis process	t
		LT3	Lead time graduation (scheduling)	t
CSF1, CSF2	Quality	Q1	Errors in thesis management per year /NT Errors = lost requests, names misspelling, signatures lost/missing, etc	%

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

KPI	AS IS	TO BE
NT		No change
UC		Effort lowers Cost $infrastructure_{tobe}$ higher Overall UC should decrease a lot (effort is variable, high cost proportional to NT, cost infrastructure is fixed)
LT		Possibly reduction in LTs (electronic exchanges instead of paper)
Q1		Should decrease (automation, less data entry)

6 Define the TCO for the university to shift to the TO BE situation

Phase	Cost
Construction	Development of new IT infrastructure (extension of web portal)
Deployment	Deployment of new functions of IT portal, training of employees
Operation maintenance	Hardware infrastructure operation and maintenance, web application operation adn maintenance
Dismissal	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	Construction, deployment				
cost		Op, maint	Op, maint	Op, maint	Op maint
saving	Effort of personnel (teachers, administration)	Effort of personnel (teachers, administration)	Effort of personnel (teachers, administration)	Effort of personnel (teachers, administration)	Effort of personnel (teachers, administration)

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

Why?

UC should decrease very much (many activities automated, employee effort reduced, on the long term this recovers the investment to extend the web portal)
LT should decrease (so student satisfaction increases)
Q1 improves

9 A company develops internally its web site (that supports all information on its products plus ecommerce) and deploys it on a virtual machine rented by an external provider. Besides, it uses a complete call center operated by another company to provide assistance to customers for the ecommerce site. Characterize this case in terms of the 3 outsourcing dimensions.

Web application: Activity= application; location=onsite; unicity= dedicated
Hardware: Activity= IT infrastructure; location=offsite; unicity= shared
Call center: Activity= process; location=offsite; unicity= dedicated (the specific CRM service) + shared (the call center infrastructure and personnel)

Propose a few SLAs to monitor the relationship with the call center company
% of satisfied customers
Unit average cost for an interaction with a customer
Average, min, max Time the customer must wait at telephone line before operator answers

10 Considering the thesis management case, and considering the Business Model Canvas approach, characterize CR (customer relationship) and the CHANNEL between the student and the university.

CR: self service (no customized service, no dedicated personnel)
Channel: web portal

11 Sketch below an organizational chart for a company organized in divisions.

See slides