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Information Systems 01PDWOV

3 March 2017

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

Travel management in university.
Employees of companies and universities may travel for business. In this case expenses for the travel are paid by the company and accidents are covered by the company's insurance. However a specific procedure must be followed.

First the employee has to ask authorization to do the travel. If granted, the employee performs the travel and pays part or all of the expenses. Finally the employee asks for reimbursement. The company checks the expenses and reimburses all or part of them. Expenses are then written in the balance sheet of the company. Both for checks and for accounting each expense must be documented (invoice, note, ticket) and stored for 5 years. A number of rules defines the type of expenses that are reimbursed and the reimbursement level (for instance no trips in business class, or trips in any class but with a reimbursement ceiling).

In a certain university the AS IS situation is as follows. The university is organized in 11 departments. Each department has an administrative employee in charge of the process. The employee who needs to travel fills in a paper form (in fact an excel sheet with a defined template, that is later printed), attaches to it paper documentation to justify the travel (request from a superior in hierarchy or invitation from other university or else) signs and hands the paper folder to the administrative employee in the department. The administrative employee performs an initial check (all needed information and documents are available) and if positive submits all to the director of department. The director signs the authorization (or not if some rule is violated). The paper folder is sent back to the employee – this closes the authorization process.

After the travel the employee fills another paper form (again an excel sheet with a defined template) with the list of expenses done during the travel (hotels, trains/buses, food etc). The employee signs the form (declaring under his responsibility that the expenses are real). For each expense a (paper) evidence must be attached. All is added to the paper folder. The paper folder is handed again to the administrative employee in the department. The administrative employee checks the expenses, approves them or not (according to company rules), computes the amount to be reimbursed and performs the reimbursement. He also has to record the expenses in the accounting system. Also the reimbursement is done as a bank transfer to the employee, via the accounting system. Finally the employee stores the folder in a specific cabinet where it is kept for at least 5 years.

The TO BE situation is as follows. A web portal is set up with a web application to handle the process. The employee fills in the travel request with the same information but of course digital (documents are attached as files to the request), signs it electronically. Completeness checks are done automatically. Higher level checks are performed by an administrative employee. However, a new central office for the whole university is set up for these tasks (instead of 11 administrative employees, one per department). If all checks are passed the travel request is approved, and the employee is notified by the web portal.

Similarly, after the travel the employee fills the second form on the web portal, attaches for each expense evidence (in form of scan of documents, files etc), signs digitally. Again the central office checks, possibly approves, reimburses. The new application is linked directly with the accounting system to record all expenses, and to the banking system for the bank transfer to the employee. By

law paper evidence of expenses has still to be stored for 5 years. So in the end the employee collects (or prints) evidence and sends it by internal mail to the central office, that stores it for 5 years.

In the following, model the TO BE situation.

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

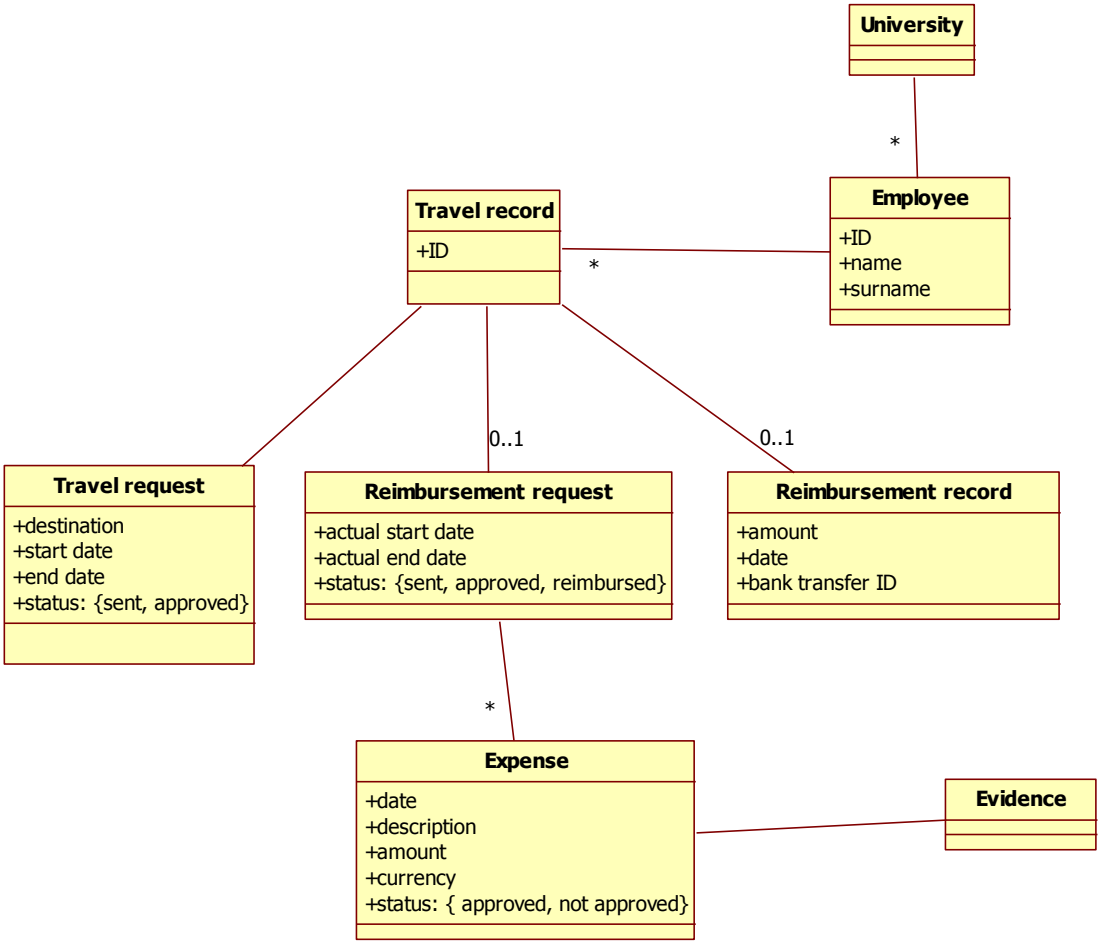
Client: PC (employees, director)
Server: Travel application, accounting application

2 Organizational model: list roles or organizational units involved

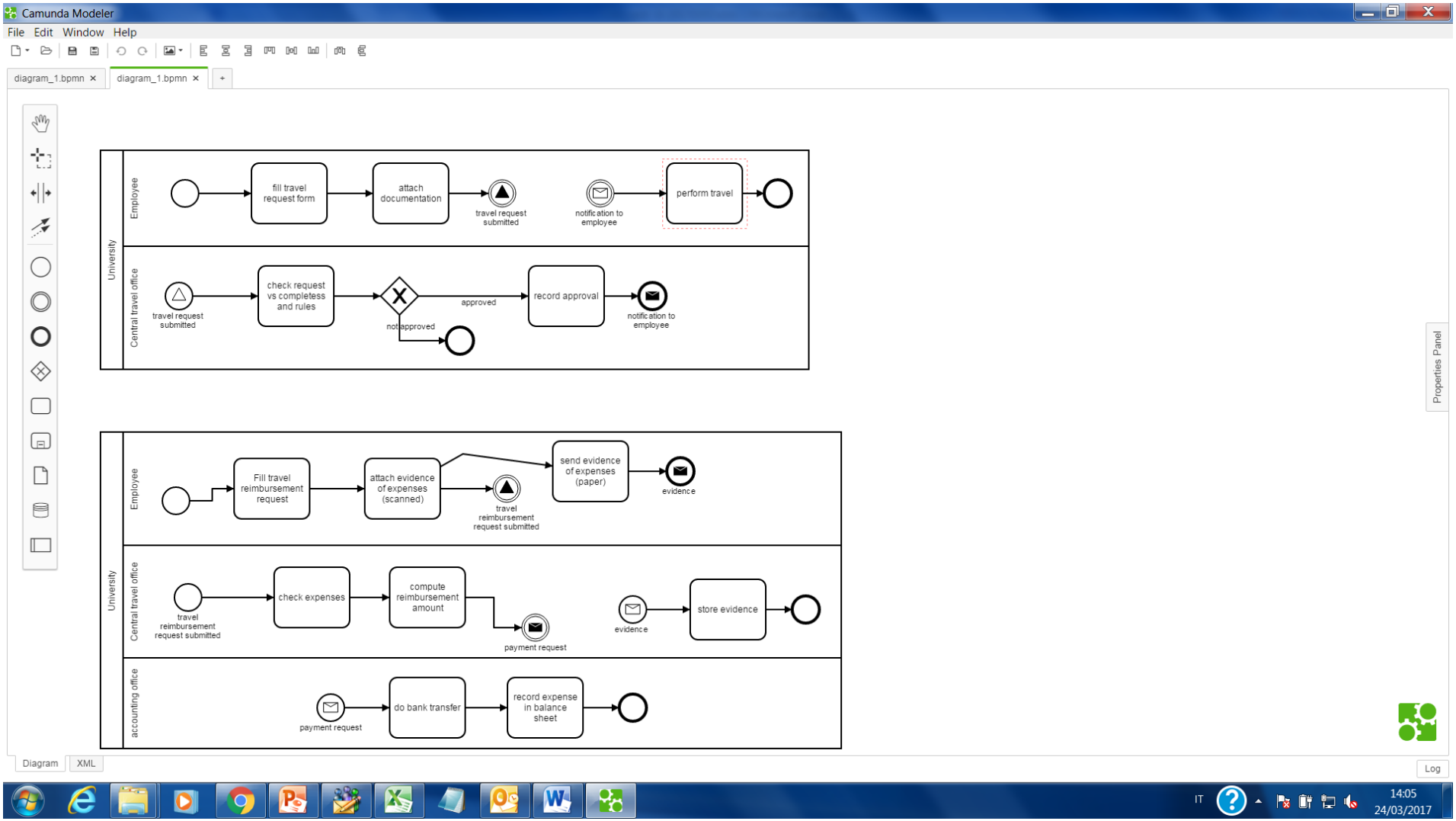
University
- Department
  - Employee (who travels)
- Travel office
  - Administrative employee

Accounting system / bank system

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



Travel record is the entry point for all information about a travel (initial request, reimbursement request, reimbursement record). It has a unique ID that identifies also initial request, reimbursement request and reimbursement record, since multiplicity with them is 0-1. (It corresponds to the paper folder).


Camunda Modeler
File Edit Window Help
diagram_1.bpmn
diagram_1.bpmn
University
Employee
fill travel request form
attach documentation
travel request submitted
notification to employee
perform travel
Central travel office
travel request submitted
check request vs completess and rules
not approved
approved
record approval
notification to employee
Employee
Fill travel reimbursement request
attach evidence of expenses (scanned)
travel reimbursement request submitted
send evidence of expenses (paper)
evidence
Central travel office
travel reimbursement request submitted
check expenses
compute reimbursement amount
payment request
evidence
store evidence
accounting office
payment request
do bank transfer
record expense in balance sheet
Properties Panel
Diagram
XML
Log
IT
14:05
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4 Define the KPIs, considering these high level business goals (or CSF), CSF1 increase employee (who travels) satisfaction, CSF2 minimize cost of the travel 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	N_T	Number of travel requests per year	
		N_R	Number of travel reimbursement requests per year (should be nearly equal to N_T)	
		N_P	Number of administrative personnel to manage the process	
CSF2	Efficiency	UC_T	Unit cost to handle travel request + reimbursement (effort of admin employees + effort traveling employee + effort director + storage cost + infrastructure cost)/N_T Effort is for activities in BPMN only Infrastructure = IT + paper	Euro
CSF1	Service	LT_req	Lead time to obtain authorization (from traveling employee sends request to notification of accept/reject)	Days
CSF1		LT_reimb	Lead time for reimbursement (from time travel employee sends request of reimbursement to time of bank transfer started) Better to exclude time for bank transfer because this depends on the bank, not on the university	Days
CSF1, CSF2	Quality	N_err	Number of travel process instances with an error, per year / N_T Error: instance lost, reimbursement wrong, bank transfer wrong, rule applied wrongly, ..	%

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

KPI	AS IS	TO BE
N_T, N_R		No change
N_P		Should decrease radically (economy of scale, one central office instead of 11, and no more repeated data entry)
UC_T		Should decrease (no more repeated data entry, many rules applied automatically)
LT_req, LT_reimb		Should decrease (same reason as above, electronic data transmission faster than paper transmission)
N_err		Should decrease (same reason as above, electronic data transmission more reliable than paper transmission)

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 and maintenance
Dismissal	Uninstall web app, Data porting to new future IT infrastructure

6 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	$UC\_T_{tobe} - UC\_T_{asis}$	$UC\_T_{tobe} - UC\_T_{asis}$	$UC\_T_{tobe} - UC\_T_{asis}$	$UC\_T_{tobe} - UC\_T_{asis}$	$UC\_T_{tobe} - UC\_T_{asis}$

$UC\_T_{tobe} - UC\_T_{asis}$ is due mostly to saving in administrative employee effort (automated checks instead of manual, less errors and less time spent to fix them) and traveling employees (less effort in doing and managing the travel paperwork). No change in storage of paper evidence, unfortunately.

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

Why?

All KPIs improve (lead times, quality) while unit cost decreases.

9 Consider the travel management process of point 1. Identify in it the categories of agency costs (according to agency theory)

Monitoring: admin employee effort + director effort to control travel request (avoid cheating of employees) , admin employee effort to control travel reimbursement request (avoid cheating, false evidence etc).
Bonding: traveling employee effort to justify travel, to justify expenses
Residual loss: cost of travel higher than needed

10 Considering the Business Model Canvas approach, describe briefly the multi sided business model, and provide an example of it.

Provision of different services to different customers (== sides)
Two sided: google search engine (free for end users, paid for companies who want to appear in top 4 position of SEERP)
Two sided: commercial TV (free content for end users, paid ad time for companies)

11 The ERP model proposes ‘data sharing’ instead of ‘legacy islands’ in information systems. Explain briefly

Legacy islands are applications working on local data that is replicated (ex list of customers replicated between application to support marketing and application to support warehouse and shippings). Data replication implies inconsistencies in data and cost of tools to support data consistency.

12 In terms of CRM, give an example of a complete, end-to-end service chain

Receiving order of item from customer, planning and executing production of item, shipping item, monitoring user satisfaction, providing assistance in using item.