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## Information Systems 01PDWOV

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

Gym company management. The company GYM manages many fitness centers in several cities (around 50 centers in 20 cities). Overall it has 50.000 customers, a dozen full time employees per each center plus a number of part time instructors. Each center typically has many facilities (swimming pool, spa, bar, weights room, etc), each center proposes a weekly schedule of activities (ex functional training in room x from time y to time z with instructor k). Each customer has a card that he/she must use to check in – checkout in a center, using turnstiles. A customer can access any center. A customer can pay in several ways, that consider the duration (access for one day, one week, one month, one year) and the type (access to all/part activities and facilities) of services used.

In the following you are requested to model the IS supporting this company, TO BE situation. Focus on the processes to handle payments of customers, management of the facilities (schedules etc), and access of customers to facilities.

In the AS IS situation the control of the right of a customer to access a certain service is made manually (an employee checks visually the card of the customer). This approach is not effective. In the TO BE situation each facility (room, pool, etc) is equipped with a card reader (without turnstile), that shows a red / green light to stop/grant access.

Besides, a typical problem in the AS IS is that sometimes activities are overcrowded. In the TO BE situation a customer can book an activity using a web site + app on smartphone. Customers with booking have precedence in accessing an activity.

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

Client: PC for employees , pc/smartphone for customers, turnstile, card reader

Server: DB with all customers (for all centers) and their status

Status of each gym center

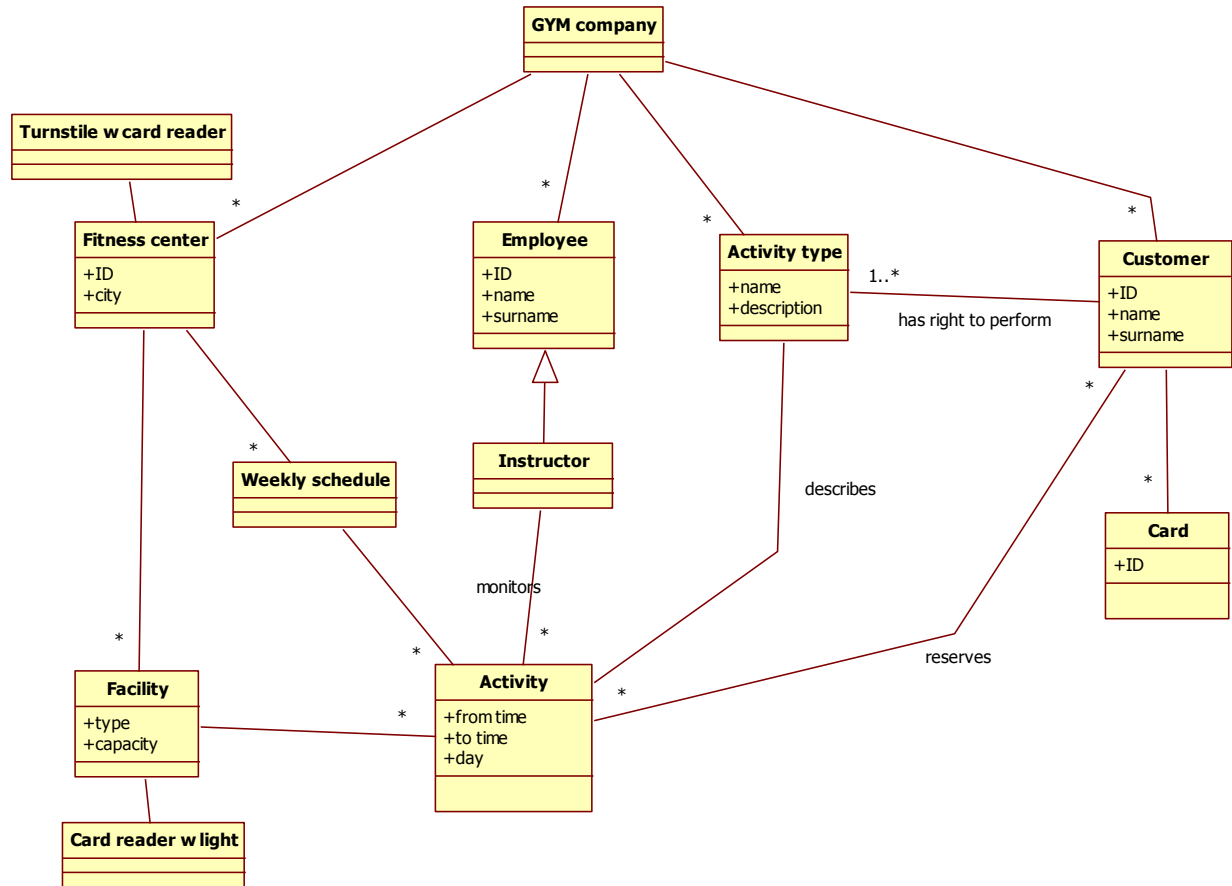
### 2 Organizational model: list roles or organizational units involved

Gym company (IT administrator, CEO)

Gym center (admin employee, instructor)

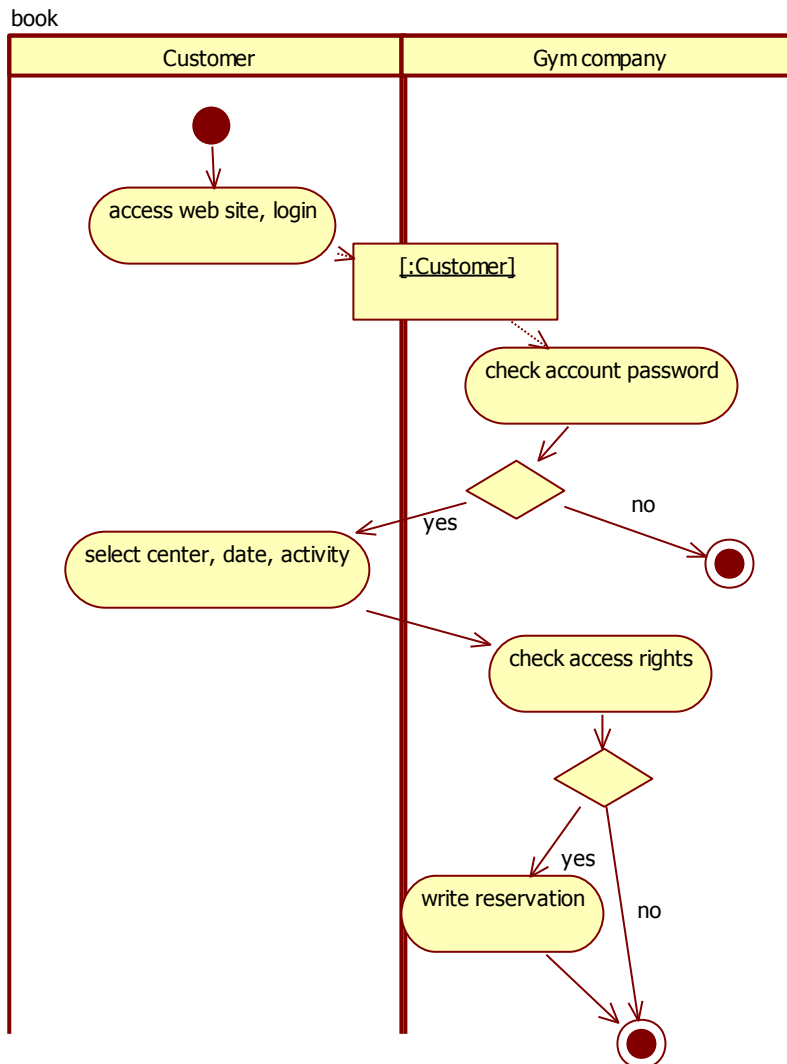
Customer

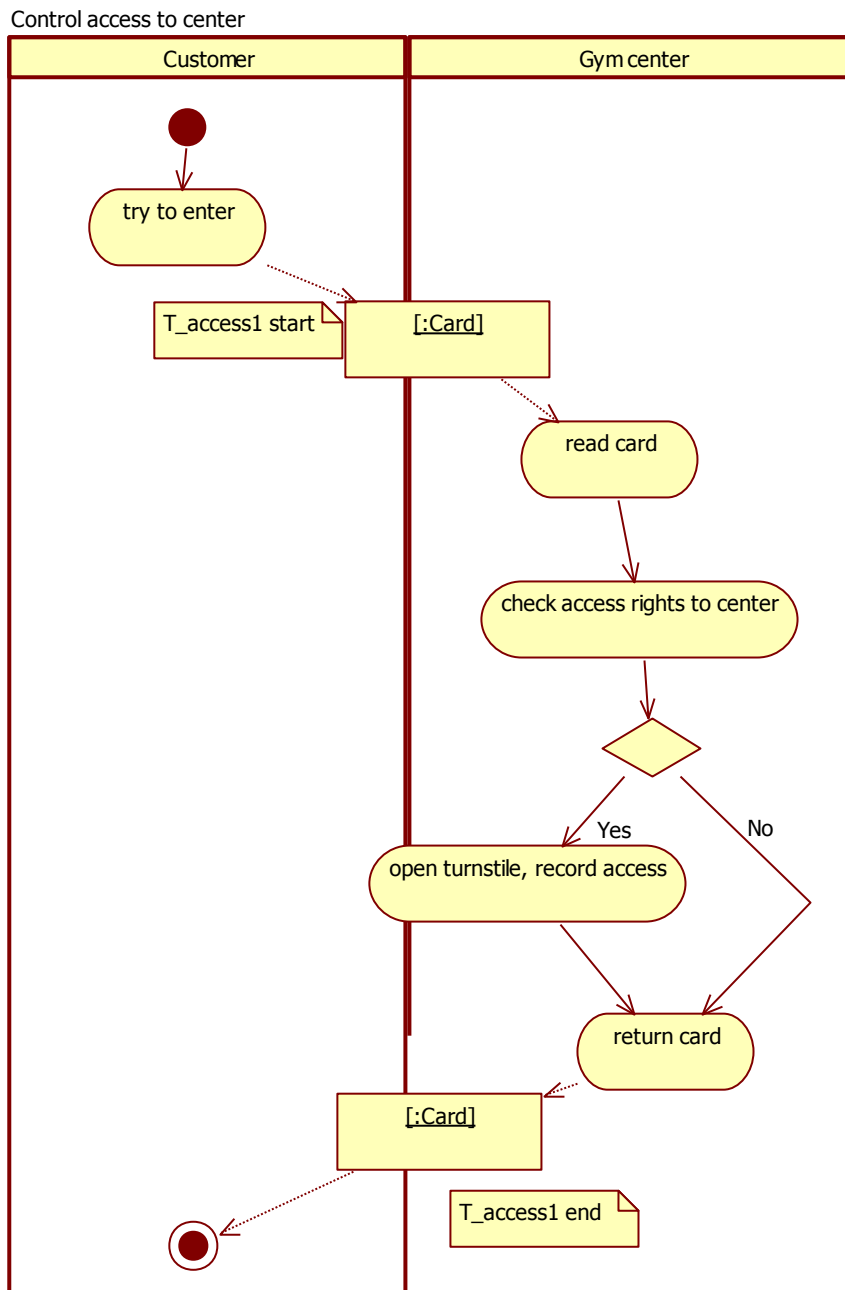
- 3 Functional model: Design and model (using UML activity diagrams with swimlanes + class diagram) the needed processes (subdividing it as needed in subprocesses)



The Gym company has many centers, employees, customers. Each customer has a RFID card issued by the Gym company. Each center has facilities (weight rooms or pool or else). Each Fitness center has turnstiles to grant access to customers, each facility has a card reader for the same purpose. An activity is described by an Activity type (ex functional training), happens in a certain day / time, in a certain facility. A weekly schedule lists the activities performed in a week in a center. A customer has certain rights of access, in general to a subset of activity types (not of activities – access to an activity is granted or not checking the access right of the customer to the activity type).

The important processes are: subscription of customer, payment, reservation of an activity, access control at gym center, access control at facility, definition/modification of weekly schedule.  
In the following we model





Control access to facility is same as above, except green/red light is operated instead of turnstile

4 Define the KPIs, considering these high level business goals (or CSF), CSF1 increase customer satisfaction, CSF2 minimize cost of the access monitoring 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_customers (per year), N_cards, N_center, N_employees, N_activities	
		C_ATOT	Cost of access monitoring (personnel effort, infrastructure, IS to support – in one year)	Euro
CSF2	Efficiency	UC	Unit cost = C_ATOT/ N_customers	Euro
CSF2	Efficiency	C_A	Cost of personnel effort for access monitoring	Euro
CSF1	Service	T_Access1 T_Access2	Response time to grant access to center Response time to grant access to facility	t
CSF1	Quality	N_O	Number of overcrowded activities / N_activities	%
CSF2	Quality	N_A	Number of activities accessed by customers without access right / N_Activities	%

C\_A (cost ONLY for access monitoring) is essential for ROI analysis, and must consider only access monitoring, because the change between ASIS and TOBE is only on access monitoring

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

KPI	AS IS	TO BE
N_customers (per year), N_cards, N_center, N_employees, N_activities		No change
C_ATOT		Infrastructure cost increases (more card readers), effort could decrease – but overall this decrease cannot be used to reduce personnel – so in total slight increase
C_A		Should decrease (but probably not enough to reduce personnel)
T_access1		No change
T_access2		There was no control in as is
N_O		Could decrease
N_A		Should decrease

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

Phase	Cost
Construction	C_C (acquire card readers for facilities, modify IS)
Deployment	C_D (install card readers)
Operation	C_O (electricity, effort personnel)
Maintenance	C_M (repair card readers)
Dismissal	C_Dis (uninstall card readers)

Costs above only for the changed part (adding card readers in facilities). The existing access control system (turnstiles, IS) is not considered, as already in place.

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_C, C_D, C_O	C_O, C_M	C_O, C_M	C_O, C_M	C_O, C_M C_dis
Saving	$C_{A_{TOBE}} - C_{A_{ASIS}}$	$C_{A_{TOBE}} - C_{A_{ASIS}}$	$C_{A_{TOBE}} - C_{A_{ASIS}}$	$C_{A_{TOBE}} - C_{A_{ASIS}}$	$C_{A_{TOBE}} - C_{A_{ASIS}}$

Costs are sure, savings uncertain sin

In practice there are no money savings but only increased costs

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

Why?

On the cost side (CSF2, roi) there are no money savings, but investments to acquire and install the card readers. This cost, considered over a 5 years period, is probably negligible if compared with the turnover of the company.

On the customer satisfaction side (CSF1) there should be a meaningful improvement, and this is the main reason to do the change.

9 In the GYM case the management of the IS is completely subcontracted to an external IT company. GYM has only one employee that plays the role of CIO, overlooks to all IT needs of the company, monitors the operation of IT and interacts with the subcontract.

- Propose a few SLAs to monitor the outsourcing relation between GYM and the external IT provider.

Cost of service per year

Availability of service

Protection of customer data

- Considering the 3 outsourcing dimensions, place this outsourcing case over the 3 dimensions

Site: off site (servers and software personnel outside GYM) + in site (Pcs for personnel, card readers + turnstiles)

Unicity: not unique (commercial package to handle gym companies, with some customized parts)

Activity: infrastructure (servers) + application (to handle GYM) (remark it is not outsourcing of processes, processes are all handled by GYM employees)

10 Propose an organization chart for GYM. Write clearly what organizational model you use.

Functional

finance, HR, accounting, marketing are centralized in headquarters

Geographical

‘manufacturing’ (in sense of operating the centers) and sales (in sense of managing payments from customers) are replicated in each center

remark it is not divisional. The product / service offered is the same by all centers, so it is geo+functional

11 Consider a bank. What are the main high level business processes they have to set up and operate?

See slides