

Software Engineering (ISW)

Theory Evaluation. Act 1.
(Grupo 3E) November 23th 2012
ETSInf-UPV

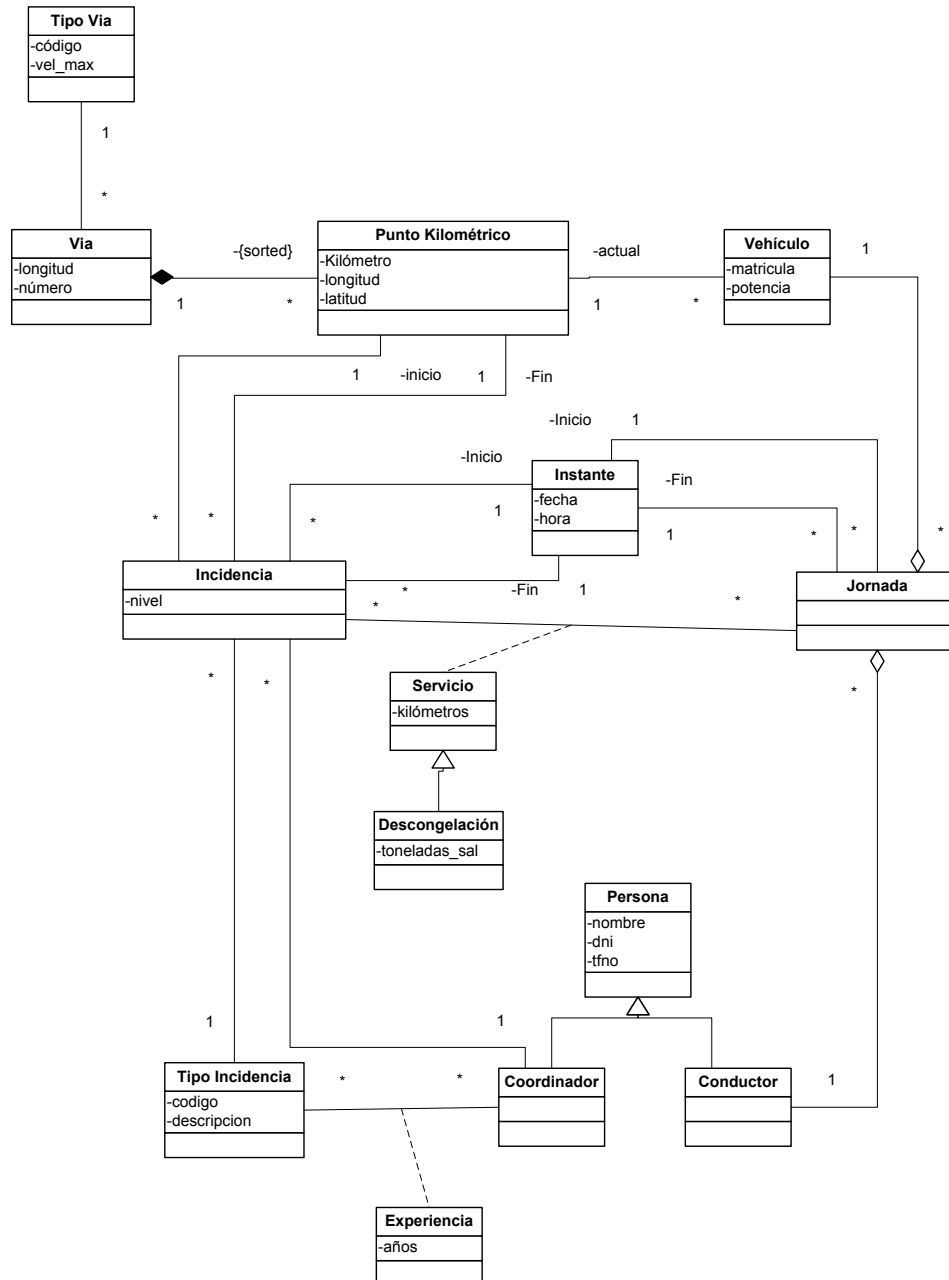
Problem (7 points) The Department of Transportation Driver and Vehicle Services needs a system for the management of incidences on the roads under its control. Each road has a number, a length in kilometers and a type. Every road type has a limit speed and a code ("HW" for highway, "N" for national road, ...). Additionally, for cartographic purposes, a road is a sequence of kilometric points, each point having the kilometer value, the latitude and the longitude. Each time something unusual occurs (accident, weather incident, traffic jam, etc) an incident is created. An incident takes place between two kilometric points of a road, has starting and ending instants (date and time), a level of dangerousness (numeric value 1 to 5), and belongs to a type of incident. Incident types are described with a numerical code and a description. In order to manage incidents, a coordinator is assigned. An assigned coordinator must be competent to manage such a type of incident and must have a minimum number of years of experience to manage such a type of incident. Additionally, every incident is assigned a number of vehicles that will participate to solve it. Each vehicle has a plate number, a power and is located at a kilometric point of a road (this information is updated in real time). Each vehicle participating in an incident is assigned to different drivers on different shifts. A shift has a starting and ending instant (date and time). To be able to manage productivity and cost billing we need to know the number of kilometers travelled by each vehicle in a shift for each incident. Persons are described in the system with a name, an id number and a phone number. The coordinator may be changed once the incident has occurred, new vehicles may be added or removed to participate in an incident. Vehicles and coordinators can be added and removed from the system. Once the incident is solved it is marked as closed. Drivers of cars are assigned for each shift associated to an incident. Shifts may be created for an incident with different durations depending on how tiring the activity is.

Given the system described above:

- a) (3'5 points) Obtain the use cases graphical model for the system described above using UML 2.0
- b) (3'5 points) Obtain the class diagram (classes with attributes names and relationships with names) using UML 2.0

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Actors

Employee, Coordinator, Vehicle

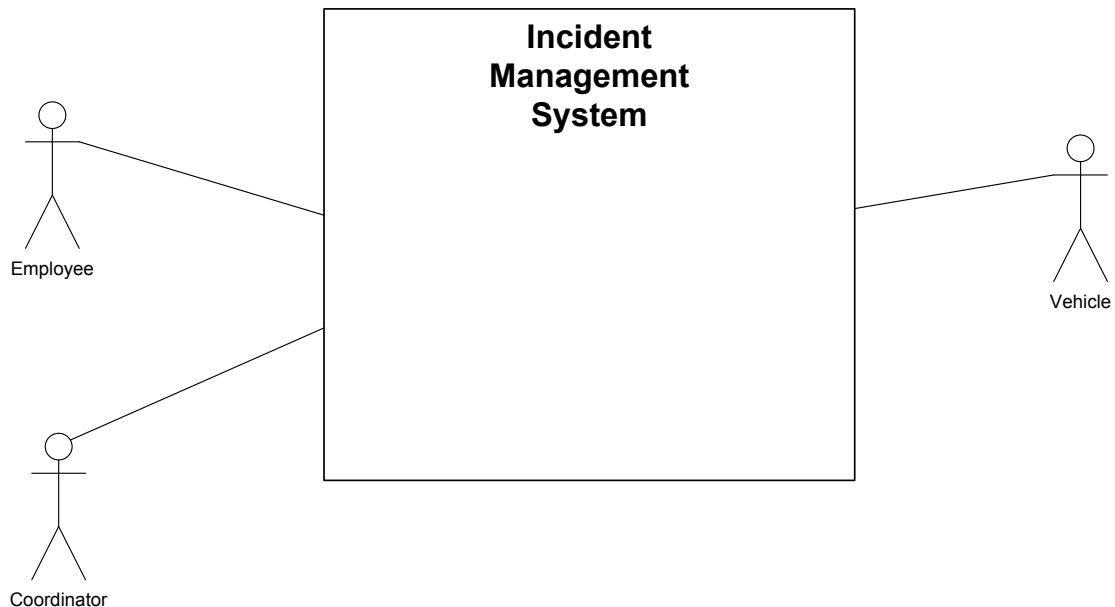
Incident Management

Add Incident
Close Incident
Change Coordinator
Remove Coordinator
Show Incident Information
Add Shift
Add Employees to Shift
Remove Employee from Shift

Vehicles Management

Assign Driver
Insert Vehicle
Remove Vehicle
Assign Vehicle to Incident
Show Vehicle Incident Information
Update Vehicle Position

Context Diagram



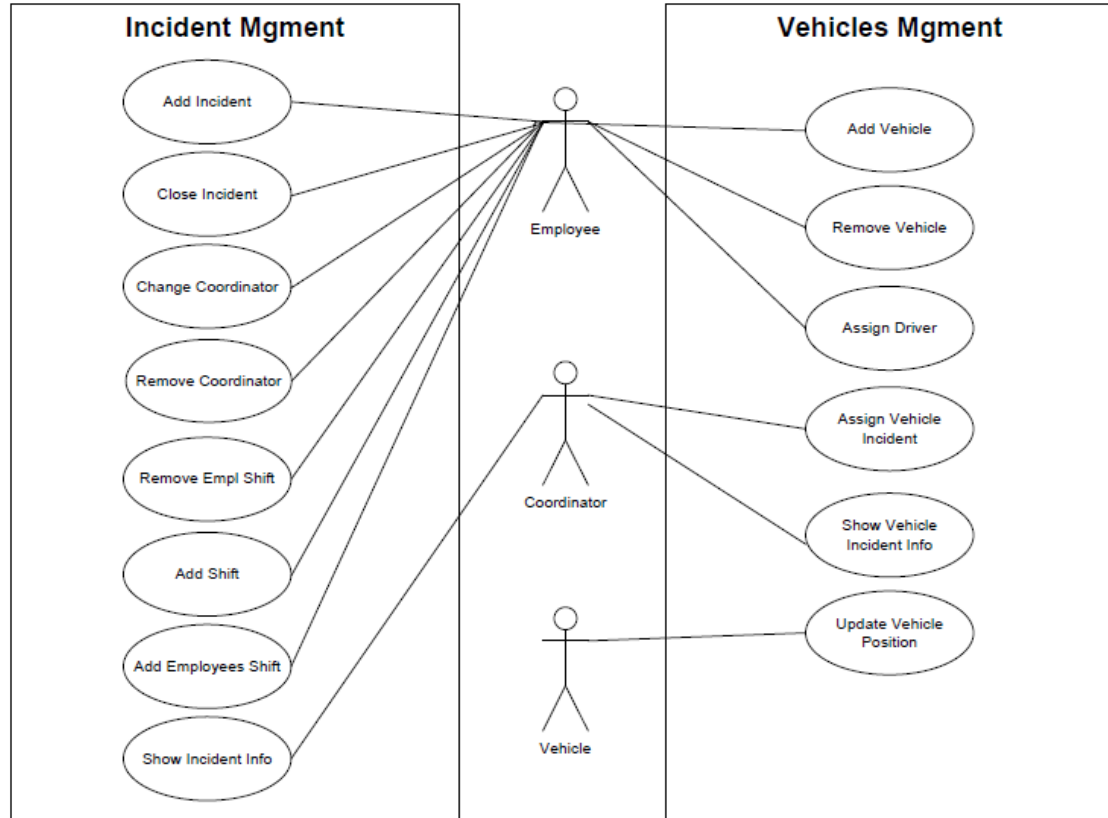
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Initial Diagram



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Structured Diagram

(Non-Exhaustive list of extensions, some error conditions not considered)

