International Space Parking Station

Domain description

This is a domain of a parking station that is located in space, hence the name International Space Parking Station (ISPS). It is a global service therefore its offices on planet Earth are spread across many countries. It has two main types of points of operation, the parking station in space and local offices on Earth.

The ISPS has two main objectives:

- Deliver the car to space and store it there.
- Return it back to its owner.

To achieve this the ISPS has to build a hard working team of people for the job and establish relations with its customers. To make all this work ISPS collects many types of data about their customers and their vehicles.

The ISPS employs mainly three types of employees.

- Managers - manage local offices
- Shop assistant - take care of customers
- Space guard - protect the parking station

Each of these play a crucial role in the workings of the ISPS. A team for a local office must consist of a manager and shop assistants. Managers are required to have a higher degree of education such as a university diploma or any other equivalent. A shop assistant must have successfully finished at least a high school. And finally a space guard must be a holder of a gun permit.

The first contact between a customer and the ISPS is a registration form. This form must be filled out and it must contain information about the car and its owner and/or owners. A single car can be “owned” by multiple people (for example a family car used by both parents and one of their children).

After registration a customer can place a so called “incoming order” for a car. An “incoming order” is an order where the car gets stored in the space parking station. (for purposes of keeping the scope of the domain narrower the process of sending a car into space in a rocket ship is being ignored).

A customer can send multiple cars into the parking station and for each of them call an “outgoing order”. An “outgoing order” is an order to start the process of returning the vehicle to the customer. This requires an address, where the car should be returned to, which must be provided by the customer. The price is calculated by the weight of the vehicle. ISPS collects quality feedback from its customers.

Constraints

1. Managers are required to have a diploma.
2. Shop assistants are required to have high school.
3. Space guards are required to hold a gun permit.
4. The minimal time a vehicle will be stored is one week, and the maximum one month.

OCL

1. Context Manager

   def: universityFinished:Boolean(Manager) = self.universityDegreeOwned:Boolean(Manager)
   inv: universityFinished->forAll(m | m.universityFinished)

2. Context Shop Assistant

   def: highSchoolFinished:Boolean(Shop Assistant) =
   self.highSchoolFnishingCertificateOwned:Boolean(Shop Assistant)
   inv: highScholEducationAcquired -> forAll(m | m.highSchoolFinished)

3. Context Space Guard

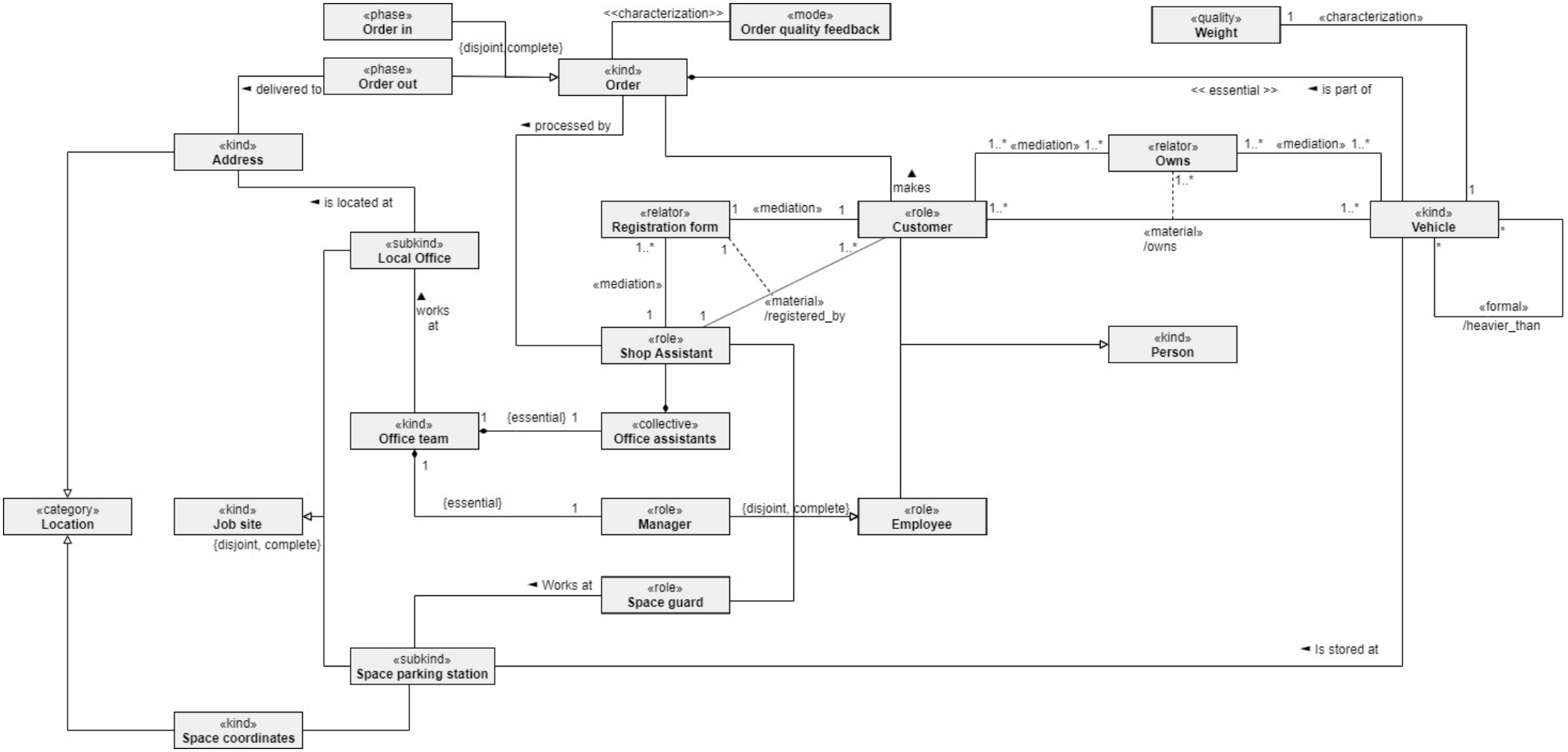
   def: validGunPermitOwned = self.gunPermitAcquired:Boolean(Guard) and
   self.gunPermitValidUntilDate:Date(Guard) > now.date:Date
   inv: validGunPermiitOwned -> forAll(m | m.validGunPermitOwned)

4. Context Registration Form

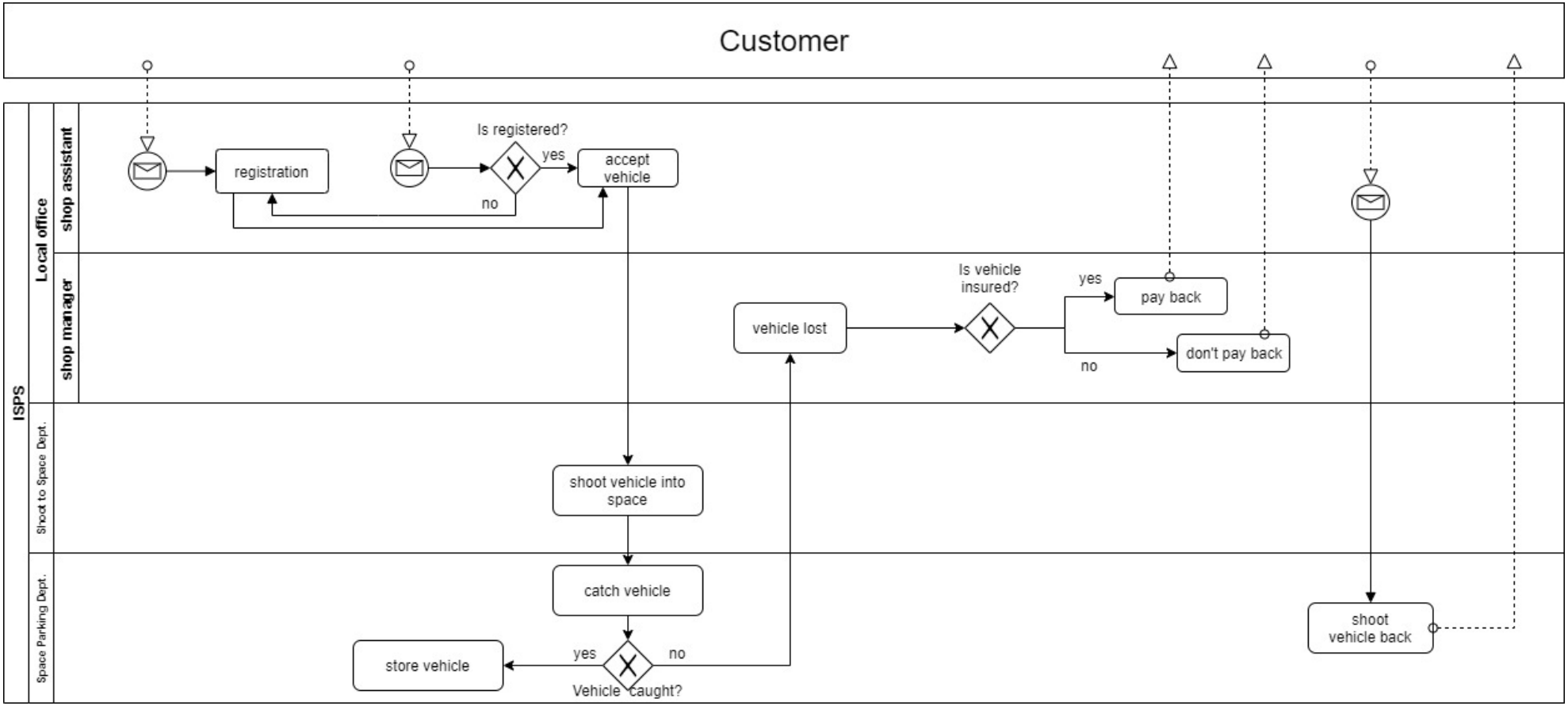
   def: isCustomer(Registration Form) = self.customer:Person
   def: isShopAssistant(Registration Form) = self.shopAssistant:Person
   inv: customerNotAssistant(Registration Form) -> forAll(m | m.customer <> m.ShopAssitant)

Table

Construct	Occurences	Total count
Kind	Order, Address, Job site, Person, Vehicle, Space coordinates	6
Subkind	Local office, Space parking station	2
Role	Employee, Shop assistant, Manager, Space guard, Customer	5
Phase	Order in, Order out	2
Category	Location	1
RoleMixin	-	0
Mixin	-	0
Whole	Office team	-
Parts	Vehicle, Manager, Office assistants, Shop assistants	-
Quantity	-	0
Collective	Office assistants	1
Quality	Weight	1
Mode	Order quality feedback	1
Relator	Registration form	1
Formal	Vehicle	1
Event	-	0


«phase»
Order in
{disjoint, complete}
<<characterization>>
«mode»
Order quality feedback
«quality»
Weight
1
«characterization»
«phase»
Order out
«kind»
Order
delivered to
<< essential >>
is part of
processed by
«kind»
Address
1..* «mediation» 1..*
«relator»
Owns
1..* «mediation» 1..*
makes
1..*
1
is located at
«relator»
Registration form
1
«mediation»
1
«role»
Customer
1..*
1..*
«kind»
Vehicle
«material»
/owns
«subkind»
Local Office
1..*
1
1..*
«mediation»
«material»
/registered_by
«formal»
/heavier_than
works
at
1
1
«role»
Shop Assistant
«kind»
Person
«kind»
Office team
1
{essential} 1
«collective»
Office assistants
1
«category»
Location
«kind»
Job site
{disjoint, complete}
{essential}
1
«role»
Manager
{disjoint, complete}
«role»
Employee
Works at
«role»
Space guard
Is stored at
«subkind»
Space parking station
«kind»
Space coordinates

BPNM model


Customer
ISPS
Local office
shop assistant
shop manager
Shoot to Space Dept.
Space Parking Dept.
registration
Is registered?
yes
no
accept vehicle
vehicle lost
Is vehicle insured?
yes
no
pay back
don't pay back
shoot vehicle into space
catch vehicle
store vehicle
yes
no
Vehicle caught?
shoot vehicle back

Transactions

T0:

The ISPS provides services of such sort as vehicle storage in space and delivery of vehicle back to earth to an address provided by the customer. The first step in this process is, registration of the customer. The customer has to provide ISPS with a vehicle to be stored. In order to accept the vehicle the customer has to be registered. Then the vehicle is stored in space.

T1:

The shop assistant sends the vehicle to the Shoot Vehicle into space Dept.(StSD) for it to be shot into space. The Shoot Vehicle into space Dept.(StSD) loads up all the cars into a rocket ship and shoots them into space.

T2:

After that the Space Parking Dept.(SPD) is responsible for catching the rocket in space and storing the vehicles.

T3:

In case the vehicle doesn't get caught by SPD, they must notify the shop manager about this event. The notification must contain a vehicle loss report for the shop manager.

T4:

The shop manager then checks whether the customer has insured the lost vehicle against vehicle space loss. In case the vehicle was insured a recompensation payment along with a letter of apology is sent to the customer.

T5:

In case the vehicle has been successfully caught it is stored until the customer requests a return of the vehicle. This request can only be made on stored vehicles. If the vehicle is in storage the SPD shoots the vehicle back to earth to the provided address.

Transaction ID	**T0**
Transaction name	**Customer wants his vehicle stored in space.**
Product	*Vehicle in space*
Request	Shooting vehicle into space
Promise	ISPS will store the vehicle in space
State	Vehicle is stored in space.
Accept	Customer accepts the fact that his car is in space.
Decline	The customer isn't registered.
Reject	Customer changes his mind and requests his car to be sent back.
Revoke request	
Revoke promise	
Revoke statement	
Revoke acceptance	

Transaction ID	**T1**
Transaction name	**Vehicle passing between shop assistant and StSD.**
Product	*Vehicle in space*
Request	Shooting vehicle into space

Promise	The StSD replies that they accept the car, and will shoot it into space.
State	StSD sends a notification about shooting the vehicle into space.
Accept	Shop assistant accepts the notification.
Decline	
Reject	Customer changes his mind and requests his car to be sent back.
Revoke request	SA requests StSD sends car back.
Revoke promise	
Revoke statement	
Revoke acceptance	

Transaction ID	**T2**
Transaction name	**StSD shoots vehicle into space. SPD catches it.**
Product	*Caught vehicle*
Request	Catch vehicle in space.
Promise	SPD promises to catch the vehicle and store it afterwards.
State	Car handled by SPD in space.
Accept	Shop manager accepts the notification.
Decline	-
Reject	-
Revoke request	
Revoke promise	
Revoke statement	
Revoke acceptance	

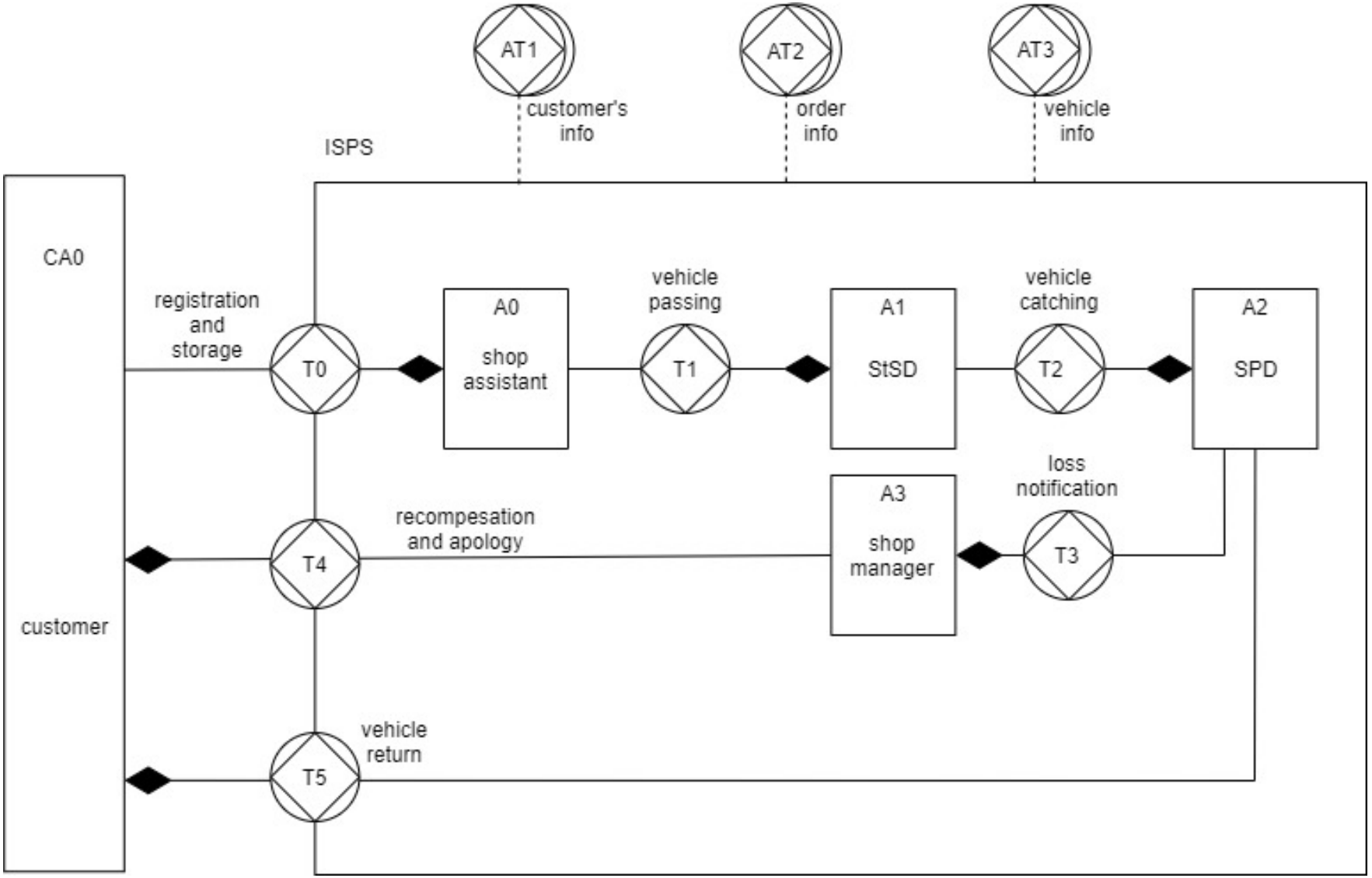
Transaction ID	**T3**
Transaction name	**Car lost in space notification.**
Product	*Car loss event handled*
Request	SPD requests the shop manager to solve the issue. Provides necessary information about the incident through a detailed report.
Promise	Shop manager promises to resolve the problem with the customer.
State	Car lost in space.
Accept	SPD accepts the fact that this is out of their competence and leaves the issue to be resolved by the shop manager.
Decline	-
Reject	-
Revoke request	
Revoke promise	
Revoke statement	
Revoke acceptance	

Transaction ID	**T4**
Transaction name	**Resolving the issue of a lost vehicle.**
Product	*Letter of apology and recompensation payment*
Request	SPD requests vehicle loss resolution.
Promise	Shop manager promises to resolve the issue of the lost vehicle.
State	Shop manager checks whether the vehicle has been insured.

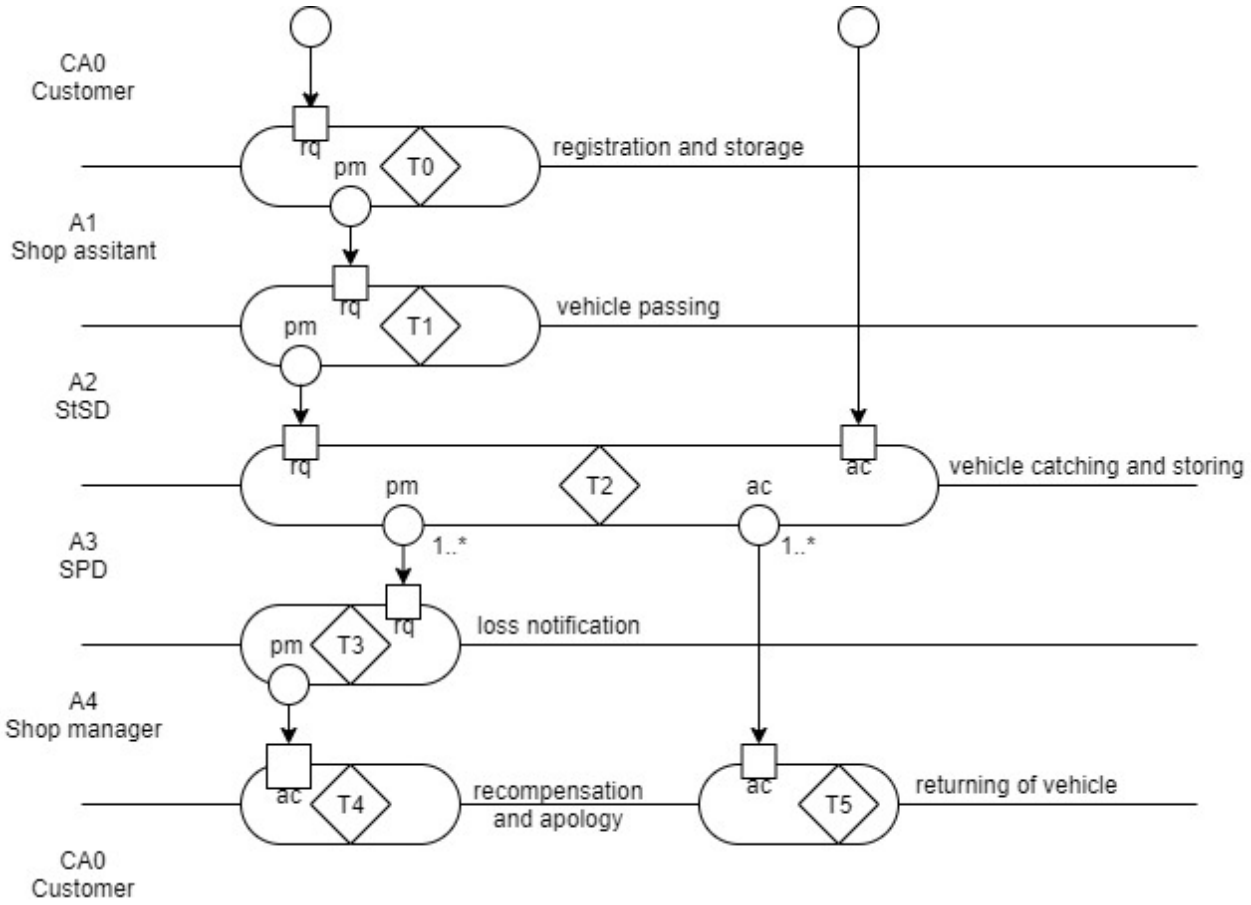
Accept	Customer accepts the fact that his car has been lost and accepts the apology and recompensation payment.
Decline	-
Reject	-
Revoke request	
Revoke promise	
Revoke statement	
Revoke acceptance	

Transaction ID	**T5**
Transaction name	**Return of vehicle to customer**
Product	*Returned vehicle*
Request	Customer requests to get his vehicle back.
Promise	ISPS promises to return vehicle back.
State	Shoot vehicle back at the location provided by the customer.
Accept	Customer accepts the vehicle at the location.
Decline	-
Reject	Customer didn't receive the right vehicle.
Revoke request	
Revoke promise	
Revoke statement	
Revoke acceptance	Complaint - sending the right car.

OCL


AT1
AT2
AT3
customer's info
order info
vehicle info
ISPS
CA0
registration and storage
T0
A0
shop assistant
vehicle passing
T1
A1
StSD
vehicle catching
T2
A2
SPD
A3
shop manager
loss notification
T3
recompesation and apology
T4
customer
vehicle return
T5

PSD


CA0
Customer
rq
pm
T0
registration and storage
A1
Shop assitant
rq
pm
T1
vehicle passing
A2
StSD
rq
ac
pm
T2
ac
vehicle catching and storing
1..*
1..*
A3
SPD
rq
pm
T3
loss notification
A4
Shop manager
ac
T4
recompensation
and apology
ac
T5
returning of vehicle
CA0
Customer