

BI-KOM, Semestral Thesis

Enterprise Engineering and Demo

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### Abstract

In this semestral thesis, we are focusing on the modelling processes in the enterprise environment from the ontological point of view. We are using DEMO methodology which is suitable for the transaction modelling, and analyzing and representing business processes. It is developed since the 1980s by Jan Dietz and others, and is inspired by the language/action perspective. We are modelling abstract domain of the future Space Transportation Company. This domain also shows how big is the potential of the ontological disciplines, also in the far future.

*Keywords:* demo, modeling, space, transportation, business, processes, enterprise

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## Colored Domain Description

### T0

Space transportation company focuses on space traveling and cargo transportation within the Milky Way galaxy. The company services are used by both civil and military customers who are recognized as subjects in the internal terminology of the company. Civil subjects can order cargo and civil services. Military subjects are capable of ordering both civil and cargo but also military services. All of the necessary information is covered in the formal contract which is signed and agreed between the subject and the company.

A subject, willing to order some kind of service, can contact the company personally by visiting one of the branch offices designed to serve the customers. Another option is to contact the office using standard subspace communication.

### T1

The whole process starts with subject contacting one of the offices. The subject explains the nature of their needs and expectations of the contract. If the company is not capable of fulfilling the subject's needs, a responsible employee will try to negotiate an agreement between the company and the subject by altering the subject's requirements. If the employee fails to negotiate terms which would suit both sides, the subject's request is rejected.

### T2

In the case of successful agreement, the company informs the subject about standard procedure of the contract signing and executing. The company has three days to write up suitable terms of the contract and the execution plan based on the information gathered from the subject. As mentioned above, the type of contract is based on the nature of the subject's needs. The

responsible employee has to mention the station which will be executing the contract. After writing up all of the necessary information, the responsible employee sends the contract, in the form of electronic message, to the subject using standard subspace communication protocol.

### T3

After receiving the necessary documents, the subject has three days to go through the terms and pass any objections to the responsible employee using subspace communication. The employee can try to negotiate new terms with the subject or in the edge case is pushed to withdrawal from the contract. If the subject has no other objections, the contract is formally signed using electronic subspace signing protocol and the contract is passed to the particular station to execute it.

The time necessary to process and execute the contract by the station is written in the formal agreement between the subject and the company. The station is obligated to execute the contract in the agreed interval. The subject pays the initial deposit which is agreed, and the amount is written in the contract.

If the nature of the contract allows it, the subject can choose a formal representative who will oversee the contract and who will be capable of making any objections during the execution process. If the subject does not choose any representative, the company will be informing the subject about the execution process state using subspace communication.

### T4

The company is obligated to resolve any objections raised by the subject. Objections are rather successfully resolved, or they may lead to canceling of the contract execution. In that case, the company starts a formal trial with the subject to formally resolve the situation.

Once the contract is successfully executed, all of the **necessary information** is passed to the subject which has **14 days to raise any objections**. The company carefully **inspects the objections** and will try to **find the solution to fulfill** the subject's requirements. If the company is not capable of resolving the problem, it **starts a formal trial to resolve the situation formally**. If the trial is not successful, **the subject can reject the services and refuse to pay for the rest of the services**.

## T5

If the contract is successful, **the subject pays the rest of the money**, and **the contract is formally ended**.

## Transaction Product Table

<b>Transaction ID</b>	<b>T0</b>
<b>Transaction name</b>	<b>Order transportation service</b>
<b>Product</b>	<i>The service is completed</i>
<b>Request</b>	A subject requires a transportation service.
<b>Promise</b>	A project completer employee responds to the request.
<b>State</b>	A project completer employee offers visiting one of the branch offices or using the subspace communication to communicate details.
<b>Accept</b>	A subject accepts an contract.
<b>Decline</b>	A project completer employee responds that the company cannot fulfill the requests, because it is not a subject of the company's business or the company has no available resources to provide.
<b>Reject</b>	A subject doesn't accept the contract because it does not fulfill their needs.
<b>Revoke request</b>	A subject changes their mind that they do not need the service.
<b>Revoke promise</b>	The company discovers the order cannot be met.
<b>Revoke statement</b>	A subject doesn't want to visit the branch office or to communicate.
<b>Revoke acceptance</b>	Negotiate an agreement or withdrawal.

<b>Transaction ID</b>	<b>T1</b>
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Transaction name	Demands formulation
<b>Product</b>	<i>Demands of the service</i>
<b>Request</b>	A subject contacts the company with their needs.
<b>Promise</b>	A demands employee accepts the needs.
<b>State</b>	A demands employee starts to negotiate the demands.
<b>Accept</b>	A subject accepts the demands formulation if they agree with it.
<b>Decline</b>	If the company cannot fulfill the requests, because it is not a subject of the company's business or the company has no available resources to provide, a demands employee declines the request.
<b>Reject</b>	A subject doesn't accept the demands because it does not fulfill their needs.
<b>Revoke request</b>	
<b>Revoke promise</b>	
<b>Revoke statement</b>	
<b>Revoke acceptance</b>	

<b>Transaction ID</b>	<b>T2</b>
<b>Transaction name</b>	<b>Contract formulation</b>
<b>Product</b>	<i>Contract of the service to be signed</i>
<b>Request</b>	Using the demands employee, a subject submits demands for contract to the company.
<b>Promise</b>	A contract employee accepts the demands and mentions a suitable station.
<b>State</b>	A demands employee starts to negotiate the demands.
<b>Accept</b>	A subject accepts the contract if it fulfill their needs.
<b>Decline</b>	If the company cannot fulfill the requests, because it is not a subject of the company's business or the company has no available resources to provide, a contract employee declines the request.
<b>Reject</b>	A subject doesn't accept the demands because it does not fulfill their needs.
<b>Revoke request</b>	
<b>Revoke promise</b>	
<b>Revoke statement</b>	

<b>Revoke acceptance</b>	
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<b>Transaction ID</b>	<b>T3</b>
<b>Transaction name</b>	<b>Contract signing</b>
<b>Product</b>	<i>Signed contract and a service in progress</i>
<b>Request</b>	A subject approves the contract and all necessary documents (in the given time), possibly with the objections.
<b>Promise</b>	If there are any objections, a contract employees starts negotiations.
<b>State</b>	A company manager hands over a signed contract.
<b>Accept</b>	A subject signs the contract and pays an initial deposit. The contract goes to the particular station executing the service. The subject might choose a formal representative.
<b>Decline</b>	
<b>Reject</b>	A subject doesn't accept the demands because it does not fulfill their needs.
<b>Revoke request</b>	
<b>Revoke promise</b>	Withdrawal from the contract.
<b>Revoke statement</b>	Withdrawal from the contract.
<b>Revoke acceptance</b>	Withdrawal from the contract.

<b>Transaction ID</b>	<b>T4</b>
<b>Transaction name</b>	<b>Resolve objections</b>
<b>Product</b>	<i>Resolved objections</i>
<b>Request</b>	A formal representative hands over some objections.
<b>Promise</b>	An objections employee takes a look and handle them.
<b>State</b>	An objections employee makes sure the objections are fixed in given time.
<b>Accept</b>	A formal representative accepts the way how objections are handled.
<b>Decline</b>	If the company is not capable of resolving the problem, it starts a formal trial to resolve the situation formally.
<b>Reject</b>	If the trial is not successful, a formal representative can reject the services and refuse to pay for the rest of the services.
<b>Revoke request</b>	

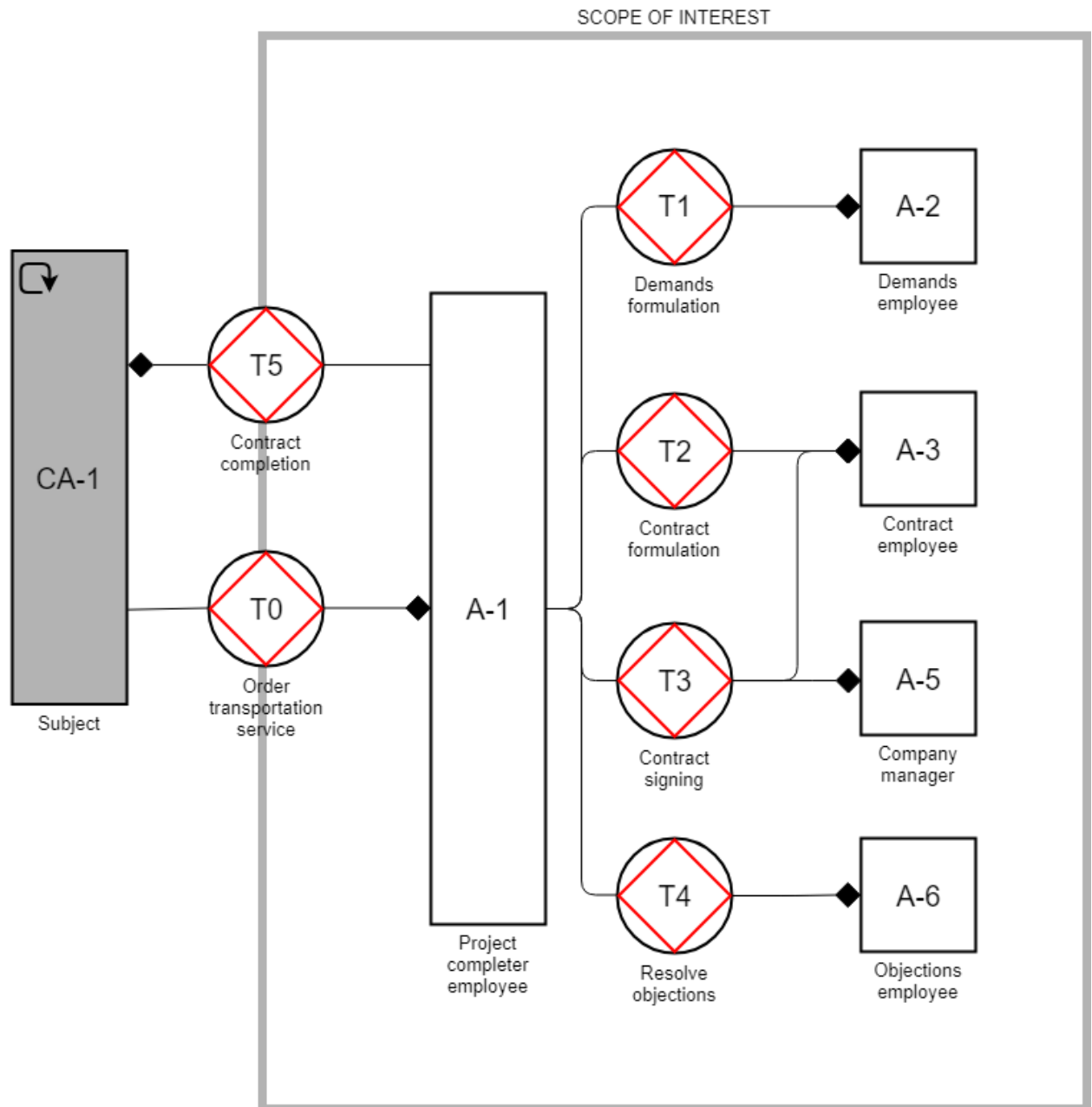


<b>Revoke promise</b>	
<b>Revoke statement</b>	
<b>Revoke acceptance</b>	

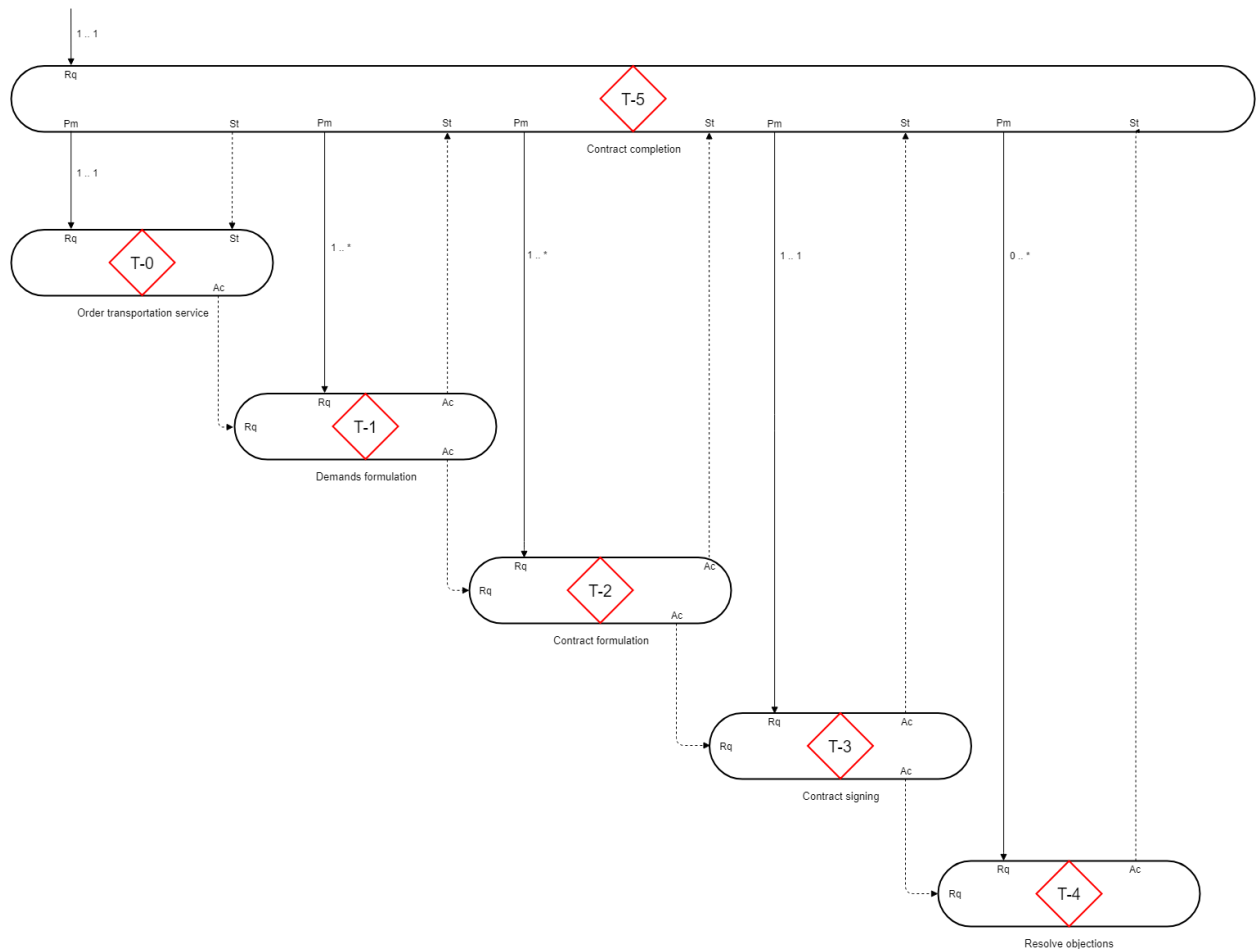
<b>Transaction ID</b>	<b>T5</b>
<b>Transaction name</b>	<b>Contract completion</b>
<b>Product</b>	<i>Completed service</i>
<b>Request</b>	A formal representative confirms the completion of the service.
<b>Promise</b>	A completion employee confirms the completion of the service.
<b>State</b>	A completion employee requests the subject to pay the rest of the money.
<b>Accept</b>	A subject pays the rest of the money and the contract is formally ended.
<b>Decline</b>	
<b>Reject</b>	
<b>Revoke request</b>	
<b>Revoke promise</b>	
<b>Revoke statement</b>	
<b>Revoke acceptance</b>	

## Diagrams

### Organization Construction Diagram – OCD



## Process Structure Diagram – PSD



### Response and Wait Links Explanation

*Contract completion* is the main transaction of the whole process. Its successful execution depends on the successful execution of the *Order transportation service*, *Demands formulation*, *Contract formulation*, *Contract signing* and *Resolve objections*. Cardinality between these transactions explains the character of the mutual dependency.

Dependency of the other transactions and the mutual dependency between them is described using “down-top” principle. *Resolve objections* can be executed once the *Contract signing* is finished which can be executed only once the *Contract formulation* is executed and analogically for the other transactions.