

# UML Static Structure Report

## Model: Static Model

**FullPath:** UML System::StaticModel  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**Contains Package(s):** UML System::StaticModel::TopPackage

### TaggedValues

**documentation**

The diagrams in this model were drawn using up to three different perspectives:

**Conceptual:** a diagram represents the concepts in the domain under study. These concepts naturally relate to the classes that implement them, but there may be no direct mapping. This perspective is mostly the result of domain analysis and requirements and provides a good description of the system that is language-independent.

**Specification:** a diagram represents the interfaces of the software system rather than the implementation. Interface-based description is a powerful concept in OO technique because an interface can have many classes that implements it.

**Implementation:** a diagram represents with bare implementation of the behavior. This diagrams are used only to illustrate a particular implementation technique.

## Model Element Statistic Summary

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Number of interfaces:	6
Number of classes:	10
Number of attributes:	4
Number of parameters:	47
Number of operations:	14
Number of methods:	15
Number of dependencies:	7
Number of associations:	11
Number of association ends:	22
Number of nodes:	2
Number of components:	2
Number of comments:	2
Number of tagged values:	358
Number of arguments:	15
Number of objects:	6
Number of collaborations:	2
Number of interactions:	2
Number of messages:	18
Number of classifier roles:	10
Number of packages:	8
Number of adornments:	10

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### Package: Agent

**Contains Package(s):** UML System::StaticModel::TopPackage::Agent::Controller  
 UML System::StaticModel::TopPackage::Agent::Learner  
 UML System::StaticModel::TopPackage::Agent::Planner  
 UML System::StaticModel::TopPackage::Agent::Model

**Contains Subsystem(s):** <None>

**FullPath:** UML System::StaticModel::TopPackage::Agent  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**Dependents**

	Rel. Name	Rel. Type	Related Element
1	Dependency6	Depends on	UML System::Static Model::Top Package::Agent::Model
2	Dependency5	Depends on	UML System::Static Model::Top Package::Agent::Controller
3	Dependency2	Depends on	UML System::Static Model::Top Package::Agent::Planner
4	Dependency3	Depends on	UML System::Static Model::Top Package::Agent::Learner

**1. Dependency6**

**Stereotype:**  
**Description:**

**2. Dependency5**

**Stereotype:**  
**Description:**

**3. Dependency2**

**Stereotype:**  
**Description:**

**4. Dependency3**

**Stereotype:**  
**Description:**

**TaggedValues**

**documentation** SpecificationPerspective:

The Applicationpackage is the main package of the TL system. It contains the main application module and the description of the interfaces for the subcomponents used by the main module.

**Classifier: ModuleFactory**

**FullPath:** UML System::StaticModel::TopPackage::Agent::ModuleFactory  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**IsActive:** No

**Operations**

**1. newPlanner**

**Visibility:** public  
**OwnerScope:** classifier  
**IsPolymorphic:** No  
**IsQuery:** No  
**CallConcurrency:** sequential

**Specification:**

**Language:**

**MethodBody:**

**Return Type Expression:** Planner

**Parameters**

**1.1. parameters**

**Type Expression:** Element  
**Kind:** in  
**DefaultValue:**

**1.2. class**

**Type Expression:** string  
**Kind:** in

**2. newController**

Visibility: public  
 OwnerScope: classifier  
 IsPolymorphic: No  
 IsQuery: No  
 CallConcurrency: sequential  
 Specification:  
 Language:  
 MethodBody:  
 Return Type Expression: Controller  
 Parameters

**2.1. class**

Type Expression: string  
 Kind: in  
 DefaultValue:

**2.2. parameters**

Type Expression: Element  
 Kind: in  
 DefaultValue:

**3. newLearner**

Visibility: public  
 OwnerScope: classifier  
 IsPolymorphic: No  
 IsQuery: No  
 CallConcurrency: sequential  
 Specification:  
 Language:  
 MethodBody:  
 Return Type Expression: Learner  
 Parameters

**3.1. parameters**

Type Expression: Element  
 Kind: in  
 DefaultValue:

**3.2. class**

Type Expression: string  
 Kind: in  
 DefaultValue:

**TaggedValues**

**documentation** SpecificationPerspective:

The factory class returns application modules given their class and parameters.

**Classifier: SimpleAgent**

FullPath: UML System::StaticModel::TopPackage::Agent::SimpleAgent  
 Visibility: public  
 Stereotype:  
 IsRoot: No  
 IsLeaf: No  
 IsAbstract: No  
 IsActive: No  
 Dependents

Rel. Name	Rel. Type	Related Element
1 Dependency4	Depends on	ModuleFactory

**1. Dependency4**

Stereotype:  
Description:

**TaggedValues**

documentation

SpecificationPerspective:

SimpleAgent is a module that instantiate specific instances of Planner, Controller, Learner according to a configuration given in an XML node.

The SimpleAgent invokes the modules as follows:

1. Controller.Percieve
2. Planner.Decide
3. Controller.Control
4. Learner.Learn

**Interface: Agent**

**FullPath:** UML System::StaticModel::TopPackage::Agent::Agent

**Visibility:** public

**IsRoot:** No

**IsLeaf:** No

**IsAbstract:** No

**Operations**

**1. Initialize**

**Visibility:** public

**OwnerScope:** instance

**IsPolymorphic:** Yes

**IsQuery:** No

**CallConcurrency:** sequential

**Specification:**

**Return Type Expression:** Element

**Parameters**

**1.1. props**

**Type Expression:** Element

**Kind:** in

**DefaultValue:**

**TaggedValues**

documentation

SpecificationPerspective:

This method indicates the beginning of a run. The module should initialize all its components and reset its internal state.

**2. executeCycle**

**Visibility:** public

**OwnerScope:** instance

**IsPolymorphic:** Yes

**IsQuery:** No

**CallConcurrency:** sequential

**Specification:**

**Return Type Expression:** bool

**TaggedValues**

documentation

SpecificationPerspective:

This method is invoked at every step for the duration of the session. The module should invoke all its components to execute the percive-decide-control-learn cycle. The method returns false to indicate the end of the session or true to continue.

**3. Terminate**

**Visibility:** public

**OwnerScope:** instance

**IsPolymorphic:** Yes

**IsQuery:** No

**CallConcurrency:** sequential

**Specification:**

**Return Type Expression:**

**TaggedValues**

SpecificationPerspective:

This method indicates the ending of a run. The module should terminate all its components.

TaggedValues  
documentation

SpecificationPerspective:

The Agent interface specifies the operations that Agent modules should implement. An instance of an agent runs at a given level in the problem solving space: (e.g., strategic, tactical, reactive).

## Package: Controller

Contains Package(s): <None>

Contains Subsystem(s): <None>

FullPath: UML System::StaticModel::TopPackage::Agent::Controller  
 Visibility: public  
 Stereotype:  
 IsRoot: No  
 IsLeaf: No  
 IsAbstract: No  
 Depends

	Rel. Name	Rel. Type	Related Element
1	Dependency7	Depends on	UML System::Static Model::Top Package::External

### 1. Dependency7

Stereotype:  
Description:

## Classifier: BasicController

FullPath: UML System::StaticModel::TopPackage::Agent::Controller::BasicController  
 Visibility: public  
 Stereotype:  
 IsRoot: No  
 IsLeaf: No  
 IsAbstract: No  
 IsActive: No  
 TaggedValues  
 documentation

SpecificationPerspective:

Basic implementation of a Controller module.

## Interface: Controller

FullPath: UML System::StaticModel::TopPackage::Agent::Controller::Controller  
 Visibility: public  
 IsRoot: No  
 IsLeaf: No  
 IsAbstract: No

### Operations

#### 1. perceive

Visibility: public  
 OwnerScope: instance  
 IsPolymorphic: Yes  
 IsQuery: No  
 CallConcurrency: sequential

#### Specification:

Return Type Expression: State

#### Parameters

##### 1.1. current

Type Expression: State

**Kind:** in  
**DefaultValue:**

**2. activate**

**Visibility:** public  
**OwnerScope:** instance  
**IsPolymorphic:** Yes  
**IsQuery:** No  
**CallConcurrency:** sequential  
**Specification:**  
**Return Type Expression:** Action

**Parameters**

**2.1. action**

**Type Expression:** Action  
**Kind:** in  
**DefaultValue:**

**3. deactivate**

**Visibility:** public  
**OwnerScope:** instance  
**IsPolymorphic:** Yes  
**IsQuery:** No  
**CallConcurrency:** sequential  
**Specification:**  
**Return Type Expression:** string

**Parameters**

**3.1. actionId**

**Type Expression:** string  
**Kind:** in  
**DefaultValue:**

**Package: Driver**

**Contains Package(s):** <None>

**Contains Subsystem(s):** <None>

**FullPath:** UML System::StaticModel::TopPackage::Driver  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**Dependents**

Rel. Name	Rel. Type	Related Element
1 Dependency1	Depends on	Agent

**1. Dependency1**

**Stereotype:**

**Description:**

**TaggedValues**

**documentation** SpecificationPerspective:

The Driver package contains the applicationmodules that control the flow of execution of a session.

**Package: External**

**Contains Package(s):** <None>

Contains Subsystem(s): <None>

**FullPath:** UML System::StaticModel::TopPackage::External  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No

## Package: Learner

Contains Package(s): <None>

Contains Subsystem(s): <None>

**FullPath:** UML System::StaticModel::TopPackage::Agent::Learner  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**TaggedValues**  
     **documentation** SpecificationPerspective:

The Learner package contains the implementation modules for different learners. Every learner must implement the Learner interface. The main objective of a learner module is to modify/update the action items in the action library.

## Classifier: BasicLearner

**FullPath:** UML System::StaticModel::TopPackage::Agent::Learner::BasicLearner  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**IsActive:** No  
**TaggedValues**  
     **documentation** SpecificationPerspective:

Basic implementation of a Learner module.

## Interface: Learner

**FullPath:** UML System::StaticModel::TopPackage::Agent::Learner::Learner  
**Visibility:** public  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No

### Operations

#### 1. learn

**Visibility:** public  
**OwnerScope:** instance  
**IsPolymorphic:** Yes  
**IsQuery:** No  
**CallConcurrency:** sequential

**Specification:**  
**Return Type Expression:** Blackboard

#### Parameters

##### 1.1. blackboard

**Type Expression:** Blackboard  
**Kind:** in  
**DefaultValue:**

**Package: Model**

Contains Package(s):	<None>
Contains Subsystem(s):	<None>
FullPath:	UML System::StaticModel::TopPackage::Agent::Model
Visibility:	public
Stereotype:	
IsRoot:	No
IsLeaf:	No
IsAbstract:	No

**Classifier: Action**

FullPath:	UML System::StaticModel::TopPackage::Agent::Model::Action
Visibility:	public
Stereotype:	
IsRoot:	No
IsLeaf:	No
IsAbstract:	No
IsActive:	No
Attributes	
<u>1. id</u>	
Visibility:	public
InitialValue:	
Multiplicity:	1
Changeable:	none
OwnerScope:	instance
TargetScope:	instance
Type Expression:	string

**Classifier: Blackboard**

FullPath:	UML System::StaticModel::TopPackage::Agent::Model::Blackboard
Visibility:	public
Stereotype:	
IsRoot:	No
IsLeaf:	No
IsAbstract:	No
IsActive:	No
Attributes	
<u>1. currentActions</u>	
Visibility:	public
InitialValue:	
Multiplicity:	*
Changeable:	none
OwnerScope:	instance
TargetScope:	instance
Type Expression:	Action[]
<u>2. currentState</u>	
Visibility:	public
InitialValue:	
Multiplicity:	1
Changeable:	none
OwnerScope:	instance
TargetScope:	instance
Type Expression:	State

**Operations**

**1. updateState**

**Visibility:** public  
**OwnerScope:** instance  
**IsPolymorphic:** No  
**IsQuery:** No  
**CallConcurrency:** sequential  
**Specification:**  
**Language:**  
**MethodBody:**  
**Return Type Expression:** State  
**Parameters**

**1.1. nextState**

**Type Expression:** State  
**Kind:** in  
**DefaultValue:**

**2. updateAction**

**Visibility:** public  
**OwnerScope:** instance  
**IsPolymorphic:** No  
**IsQuery:** No  
**CallConcurrency:** sequential  
**Specification:**  
**Language:**  
**MethodBody:**  
**Return Type Expression:** Action  
**Parameters**

**2.1. currentAction**

**Type Expression:** Action  
**Kind:** in  
**DefaultValue:**

**Classifier: State**

**FullPath:** UML System::StaticModel::TopPackage::Agent::Model::State  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**IsActive:** No

**Package: Planner**

**Contains Package(s):** <None>

**Contains Subsystem(s):** <None>

**FullPath:** UML System::StaticModel::TopPackage::Agent::Planner  
**Visibility:** public  
**Stereotype:**  
**IsRoot:** No  
**IsLeaf:** No  
**IsAbstract:** No  
**TaggedValues**  
**documentation** SpecificationPerspective:

The Planner package contains the implementation modules for different planners. Every planner must implement the Planner interface. The main objective of the planner is to decide the action that the controller should execute next given the current context (goal and current state).

