

# SCORM 2004 - 3<sup>RD</sup> EDITION

## RUNTIME CMI / ADL NAV DATAMODEL

**cmi\_version** (characterstring, RO) Represents the version of the data model

**cmi.comments\_from\_learner\_children** (comment,location.timestamp, RO) Listing of supported data model elements

**cmi.comments\_from\_learner\_count** (non-negative integer, RO) Current number of learner comments

**cmi.comments\_from\_learner.n.comment** (localized\_string\_type (SPM: 4000), RW) Textual input

**cmi.comments\_from\_learner.n.location** (characterstring (SPM: 250), RW) Point in the SCO to which the comment applies

**cmi.comments\_from\_learner.n.timestamp** (time (second,10,0), RW) Point in time at which the comment was created or most recently changed

**cmi.comments\_from\_lms\_children** (comment,location.timestamp, RO) Listing of supported data model elements

**cmi.comments\_from\_lms\_count** (non-negative integer, RO) Current number of comments from the LMS

**cmi.comments\_from\_lms.n.comment** (localized\_string\_type (SPM: 4000), RO) Comments or annotations associated with a SCO

**cmi.comments\_from\_lms.n.location** (characterstring (SPM: 250), RO) Point in the SCO to which the comment applies

**cmi.comments\_from\_lms.n.timestamp** (time(second,10,0), RO) Point in time at which the comment was created or most recently changed

**cmi.completion\_status** (state (completed, incomplete, not attempted, unknown), RW) Indicates whether the learner has completed the SCO

**cmi.completion\_threshold** (real(10,7) range (0..1), RO) Used to determine whether the SCO should be considered complete

**cmi.credit** (state (credit, no\_credit), RO) Indicates whether the learner will be credited for performance in the SCO

**cmi.entry** (state (ab\_initio, resume, ""), RO) Asserts whether the learner has previously accessed the SCO

**cmi.exit** (state (timeout, suspend, logout, normal, ""), W) Indicates how or why the learner left the SCO

**cmi.interactions\_children** (id,type,objectives.timestamp,correct\_responses,weighting,learner\_response,result,latency,description, RO) Listing of supported data model elements

**cmi.interactions\_count** (non-negative integer, RO) Current number of interactions being stored by the LMS

**cmi.interactions.n.id** (long\_identifier\_type (SPM: 4000), RW) Unique label for the interaction

**cmi.interactions.n.type** (state (true\_false, multiple\_choice, fill\_in, long\_fill\_in, matching, performance, sequencing, likert, numeric, other), RW) Which type of interaction is recorded

**cmi.interactions.n.objectives\_count** (non-negative integer, RO) Current number of objectives (i.e., objective identifiers) being stored by the LMS for this interaction

**cmi.interactions.n.objectives.n.id** (long\_identifier\_type (SPM: 4000), RW) Label for objectives associated with the interaction

**cmi.interactions.n.timestamp** (time(second,10,0), RW) Point in time at which the interaction was first made available to the learner for learner interaction and response

**cmi.interactions.n.correct\_responses\_count** (non-negative integer, RO) Current number of correct responses being stored by the LMS for this interaction

**cmi.interactions.n.correct\_responses.n.pattern** (format depends on interaction type, RW) One correct response pattern for the interaction

**cmi.interactions.n.weighting** (real (10,7), RW) Weight given to the interaction relative to other interactions

**cmi.interactions.n.learner\_response** (format depends on interaction type, RW) Data generated when a learner responds to an interaction

**cmi.interactions.n.result** (state (correct, incorrect, unanticipated, neutral, real (10,7) ), RW) Judgment of the correctness of the learner response

**cmi.interactions.n.latency** (timeinterval (second,10,2), RW) Time elapsed between the time the interaction was made available to the learner for response and the time of the first response

**cmi.interactions.n.description** (localized\_string\_type (SPM: 250), RW) Brief informative description of the interaction

**cmi.launch\_data** (characterstring (SPM: 4000), RO) Data provided to a SCO after launch, initialized from the dataFromLMS manifest element

**cmi.learner\_id** (long\_identifier\_type (SPM: 4000), RO) Identifies the learner on behalf of whom the SCO was launched

**cmi.learner\_name** (localized\_string\_type (SPM: 250), RO) Name provided for the learner by the LMS

**cmi.learner\_preference\_children** (audio\_level,language,delivery\_speed,audio\_captioning, RO) Listing of supported data model elements

**cmi.learner\_preference.audio\_level** (real(10,7), range (0..\*), RW) Specifies an intended change in perceived audio level

**cmi.learner\_preference.language** (language\_type (SPM 250), RW) The learner's preferred language for SCOs with multilingual capability

**cmi.learner\_preference.delivery\_speed** (real(10,7), range (0..\*), RW) The learner's preferred relative speed of content delivery

**cmi.learner\_preference.audio\_captioning** (state (-1,0,1), RW) Specifies whether captioning text corresponding to audio is displayed

**cmi.location** (characterstring (SPM: 1000), RW) The learner's current location in the SCO

**cmi.max\_time\_allowed** (timeinterval (second,10,2), RO) Amount of accumulated time the learner is allowed to use a SCO

**cmi.mode** (state (browse, normal, review), RO) Identifies one of three possible modes in which the SCO may be presented to the learner

**cmi.objectives\_children** (id,score,success\_status,completion\_status,description, RO) Listing of supported data model elements

**cmi.objectives\_count** (non-negative integer, RO) Current number of objectives being stored by the LMS

**cmi.objectives.n.id** (long\_identifier\_type (SPM: 4000), RW) Unique label for the objective

**cmi.objectives.n.score\_children** (scaled,raw,min,max, RO) Listing of supported data model elements

**cmi.objectives.n.score.scaled** (real (10,7) range (-1..1), RW) Number that reflects the performance of the learner for the objective

**cmi.objectives.n.score.raw** (real (10,7), RW) Number that reflects the performance of the learner, for the objective, relative to the range bounded by the values of min and max

**cmi.objectives.n.score.min** (real (10,7), RW) Minimum value, for the objective, in the range for the raw score

**cmi.objectives.n.score.max** (real (10,7), RW) Maximum value, for the objective, in the range for the raw score

**cmi.objectives.n.success\_status** (state (passed, failed, unknown), RW) Indicates whether the learner has mastered the objective

**cmi.objectives.n.completion\_status** (state (completed, incomplete, not attempted, unknown), RW) Indicates whether the learner has completed the associated objective

**cmi.objectives.n.progress\_measure** (real (10,7) range (0..1), RW) Measure of the progress the learner has made toward completing the objective

**cmi.objectives.n.description** (localized\_string\_type (SPM: 250), RW) Provides a brief informative description of the objective

**cmi.progress\_measure** (real (10,7) range (0..1), RW) Measure of the progress the learner has made toward completing the SCO

**cmi.scaled\_passing\_score** (real(10,7) range (-1 .. 1), RO) Scaled passing score required to master the SCO

**cmi.score\_children** (scaled,raw,min,max, RO) Listing of supported data model elements

**cmi.score.scaled** (real (10,7) range (-1..1), RW) Number that reflects the performance of the learner

**cmi.score.raw** (real (10,7), RW) Number that reflects the performance of the learner relative to the range bounded by the values of min and max

**cmi.score.min** (real (10,7), RW) Minimum value in the range for the raw score

**cmi.score.max** (real (10,7), RW) Maximum value in the range for the raw score

**cmi.session\_time** (timeinterval (second,10,2), WO) Amount of time that the learner has spent in the current learner session for this SCO

**cmi.success\_status** (state (passed, failed, unknown), RW) Indicates whether the learner has mastered the SCO

**cmi.suspend\_data** (characterstring (SPM: 64000), RW) Provides space to store and retrieve data between learner sessions

**cmi.time\_limit\_action** (state (exit,message, continue,message, exit,no message, continue,no message), RO) Indicates what the SCO should do when cmi.max\_time\_allowed is exceeded

**cmi.total\_time** (timeinterval (second,10,2), RO) Sum of all of the learner's session times accumulated in the current learner attempt

**adl.nav.request** (request(continue, previous, choice, exit, exitAll, abandon, abandonAll, \_none\_), RW) Navigation request to be processed immediately following Terminate()

**adl.nav.request\_valid.continue** (state (true, false, unknown), RO) Used by a SCO to determine if a Continue navigation request will succeed.

**adl.nav.request\_valid.previous** (state (true, false, unknown), RO) Used by a SCO to determine if a Previous navigation request will succeed.

**adl.nav.request\_valid.choice** (state (true, false, unknown), RO) Used by a SCO to determine if a Choice navigation request for a particular activity will succeed.

### API\_14B4\_11

```
Initialize( "" ) : bool
Terminate( "" ) : bool
GetValue( element : CMIElement ) : string
SetValue( element : CMIElement, value : string ) : bool
Commit( "" ) : bool
GetLastError() : CMIErrCode
GetErrorString( errorCode : CMIErrCode ) : string
GetDiagnostic( errorCode : CMIErrCode ) : string
```



PROVIDED BY:

**RUSTICI**  
SOFTWARE

WWW.SCORM.COM

### SEQUENCING ACTIVITY STATE DATA

#### Activity Information

##### Activity Progress Status controls:

*Activity Attempt Count* – which is the number of attempts the learner has made on this activity

##### Attempt Progress Status controls:

*Attempt Completion Amount* – which is the measure of the learner's progress towards completion and is related to cmi.progress\_status

*Attempt Completion Status* – which indicates whether an attempt is complete and is related to cmi.completion\_status

#### Objective Information

##### Objective Progress Status controls:

*Objective Satisfied Status* – which indicates whether an objective is satisfied and is related to cmi.success\_status

##### Objective Measure Status controls:

*Objective Normalized Measure* – which is the measure of the score for an objective and is related to cmi.score\_scaled

# SEQUENCING PSEUDO CODE

