



RAGE

Realising an Applied Gaming Eco-System

Competence Assessment Asset

T2.2C

created by TUGraz

October 2016

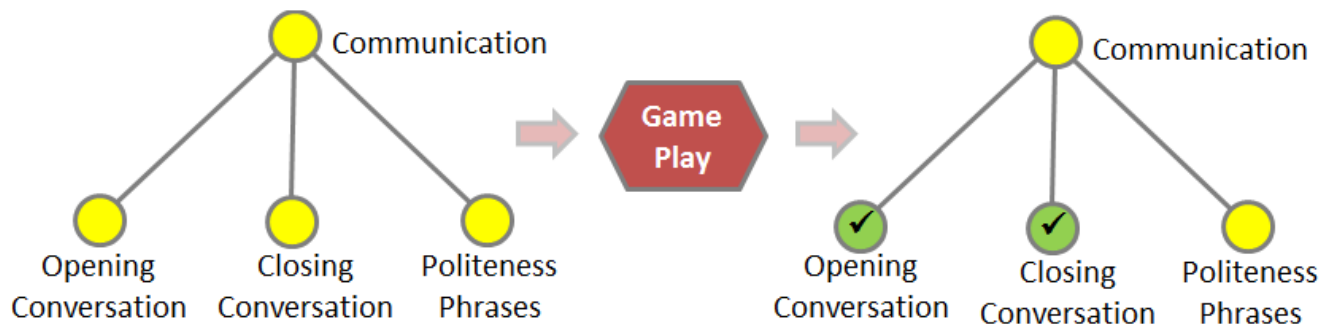


Co-funded by the Horizon 2020 Framework
Programme of the European Union



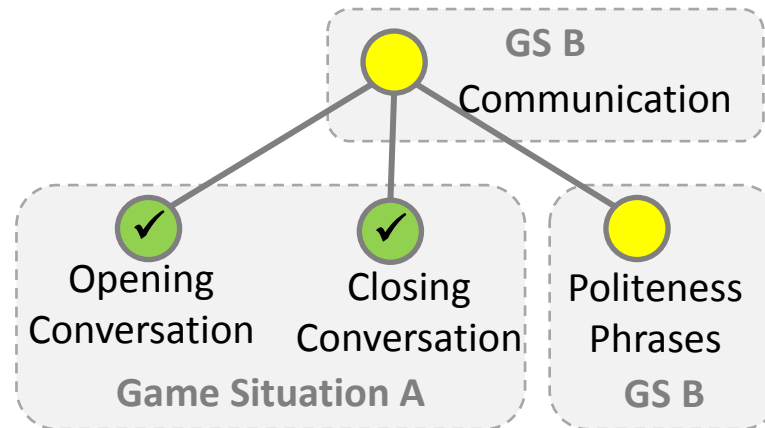
Idea and Pedagogical Value

- Non-invasive competence assessment during game play
 - Competences of the player are assessed by monitoring task completion
- Pedagogical value
 - Identification of the competence state can be used to support the learning process towards the learning goal



Asset Concept

- Assessment algorithm and theory based on Competence-based Knowledge Space Theory (CbKST)
- A domain model specifying and structuring the competences of a domain is the basis for the assessment
- Each game situation (tasks) is assigned with competences
- Based on correct/incorrect task solution for a game situation the probability values of the related competences are updated



Infrastructure / Context

- Implemented as Client side asset
- Loads Domain Model from Domain Model Asset
- Stores competence values locally and on the server

Needed/Optional Bridges	Needed/Optional Assets
ILog - optional	GameStorage - needed
IDataStorage – needed	TrackerAsset - needed
IWebServiceRequest - needed	DomainModelAsset - needed
ISerializer - needed	

Integration – Setup

- The asset needs to be created:

```
CompetenceAssessmentAsset caas = new CompetenceAssessmentAsset ();
```

- Furthermore, only the underlying Assets need to be created
 - GameStorage
 - TrackerAsset
 - DomainModel

Integration – Usage 1/2

- There are three ways of updating the competence state:
 - Direct update, by specifying the competences, the update information of which quality the update is (true means increase, false means decrease) and a list of information how strong the update should influence the possession probability.

```
List<String> compList = new List<string>();  
List<Boolean> evidenceList = new List<Boolean>();  
List<EvidencePower> evidencePowers = new List<EvidencePower>();  
compList.Add("C1");  
evidenceList.Add(true);  
evidencePowers.Add(EvidencePower.Medium);  
caa.updateCompetenceState(compList, evidenceList, evidencePowers);
```

Integration – Usage 2/2

- Updating competences based on activities. Therefore only the activity needs to be supplied, all other information is loaded from the domain model.

```
caa.updateCompetenceStateAccordingToActivity("doThingA");
```

- Updating competences according to a game situation. Therefore the game situation id needs to be supplied and the information if the game situation was mastered successfully (true) or not (false).

```
caa.updateCompetenceStateAccordingToGamesituation("gamesituation1",true);
```

Why should a game developer use the competence assets?

This asset allows an **easy handling of competence assessment within a game**

- Bringing in a psychological model of competence development into game design
- The asset enables non-invasive competence assessment
- The same domain model can be reused and shared across games

Contact and More Information

- Contact:
 - Matthias Maurer, mmaurer@tugraz.at
 - Alexander Nussbaumer, alexander.nussbaumer@tugraz.at
 - Christina Steiner, christina.steiner@tugraz.at
- More information on these assets:
 - <http://css-kti.tugraz.at/projects/rage/assets/>
- Video Demo
 - <http://css-kti.tugraz.at/projects/rage/assets/videos/Demonstration-CompetenceBasedAssets.mp4>