RAGE

Realising an Applied Gaming Eco-System

Competence Assessment Asset

T2.2C

created by TUGraz

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TU Graz

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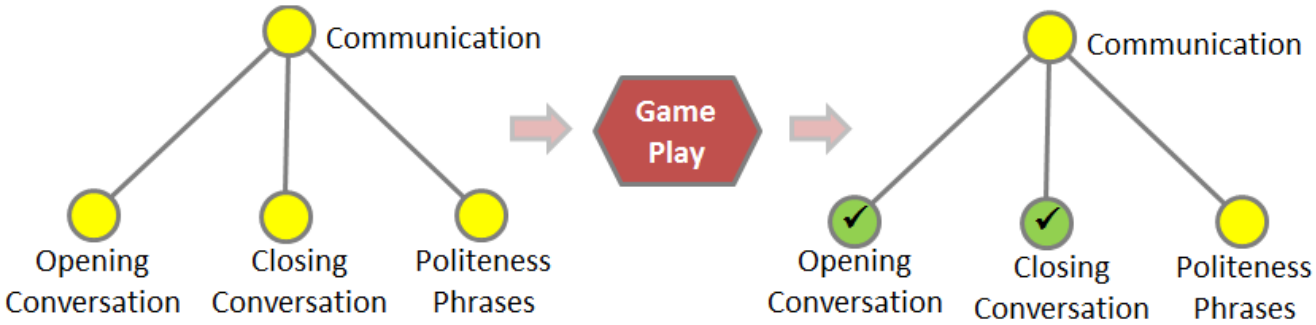
Idea and Pedagogocal Value

- 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



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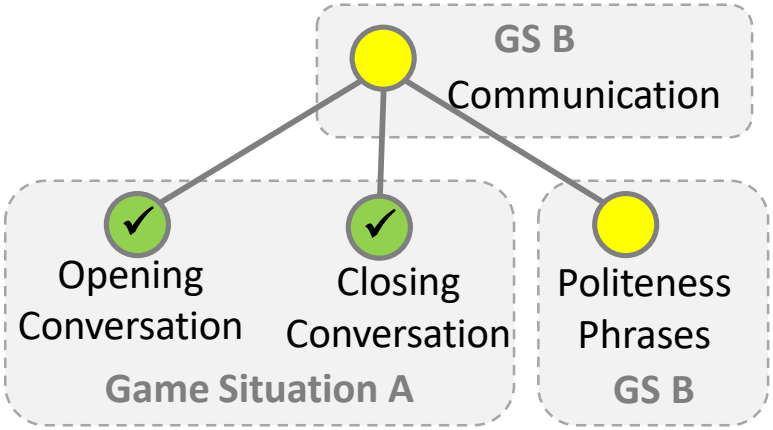
Asset Concept

- 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



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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	

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Integration – Setup

- The asset needs to be created:

```
CompetenceAssessmentAsset caas = CompetenceAssessmentAsset.Instance;
```

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

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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);
```


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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);
```


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Added Value

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

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Contact and More Information

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- 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

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