A Service Oriented Architecture for Advertising Games

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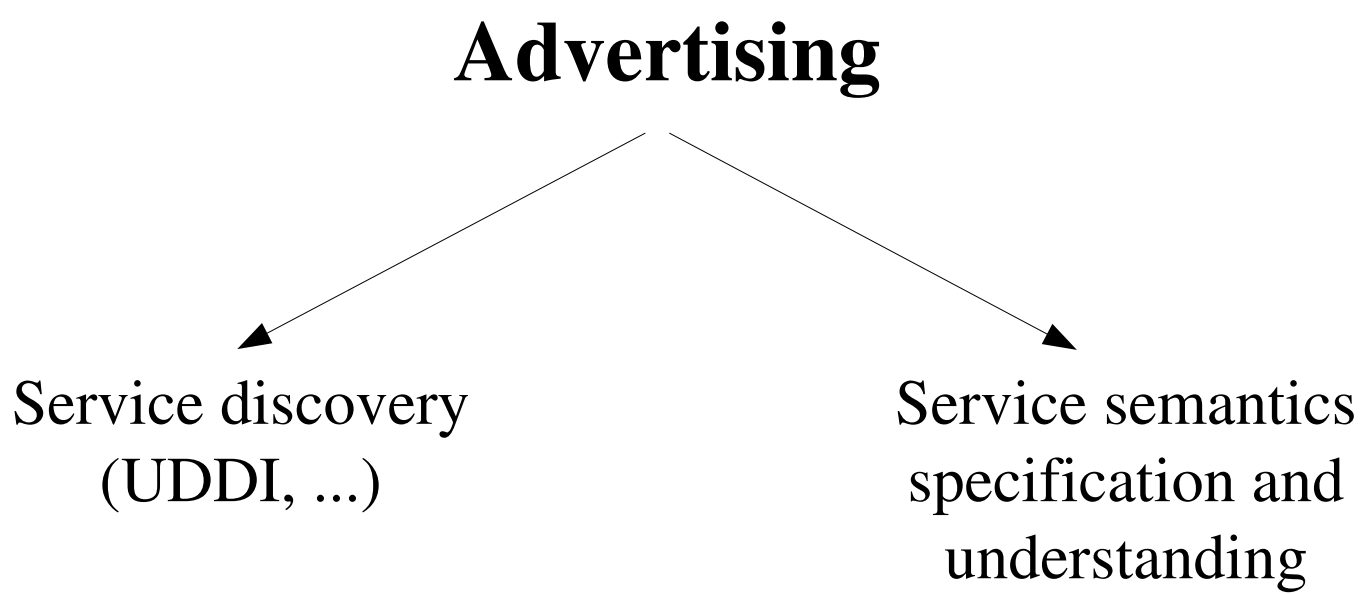
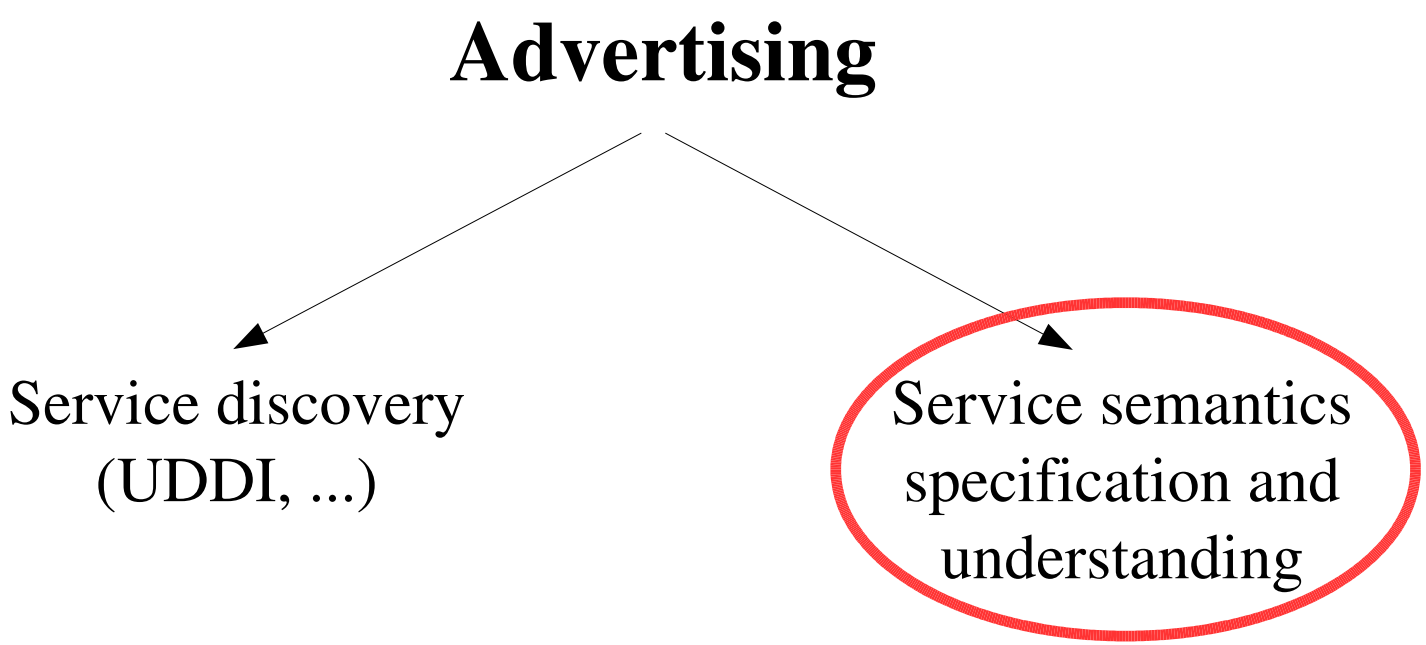
Service Advertising



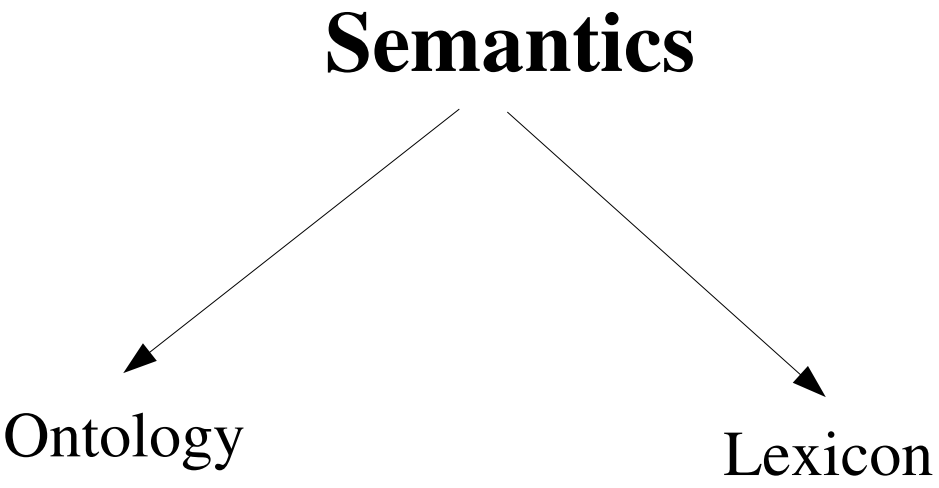
Goal: interoperability, service composition, ...

Service Advertising



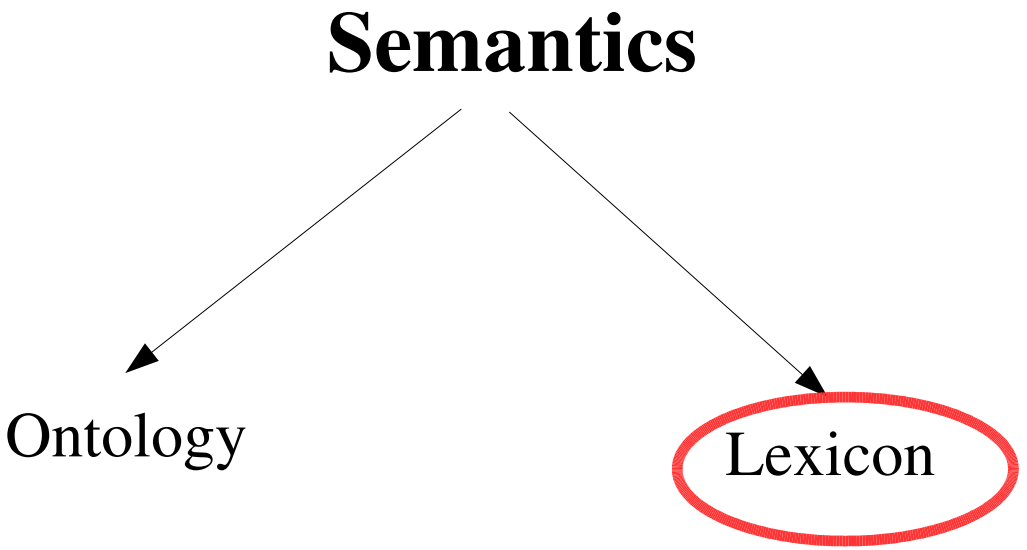
Goal: interoperability, service composition, ...

Service semantics problem



Autonomous and heterogeneous services:
hard problem!

Service semantics problem

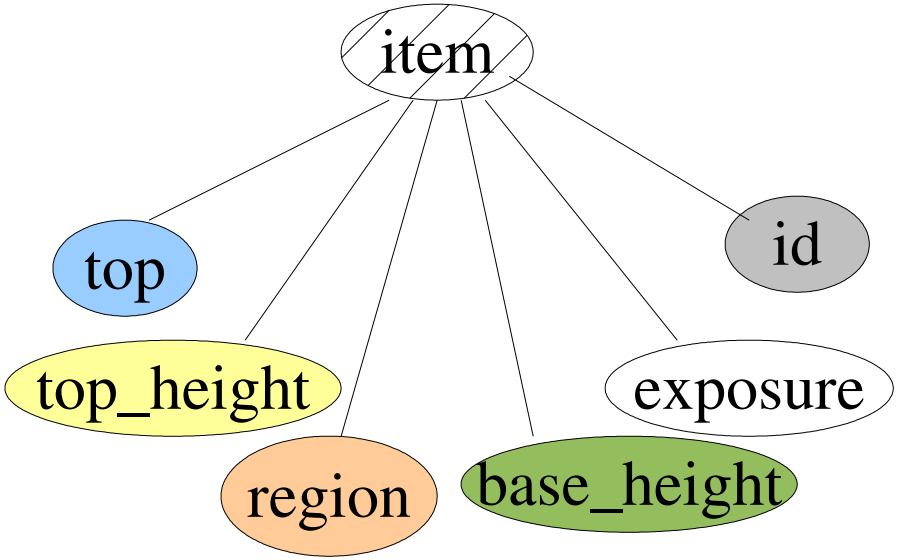


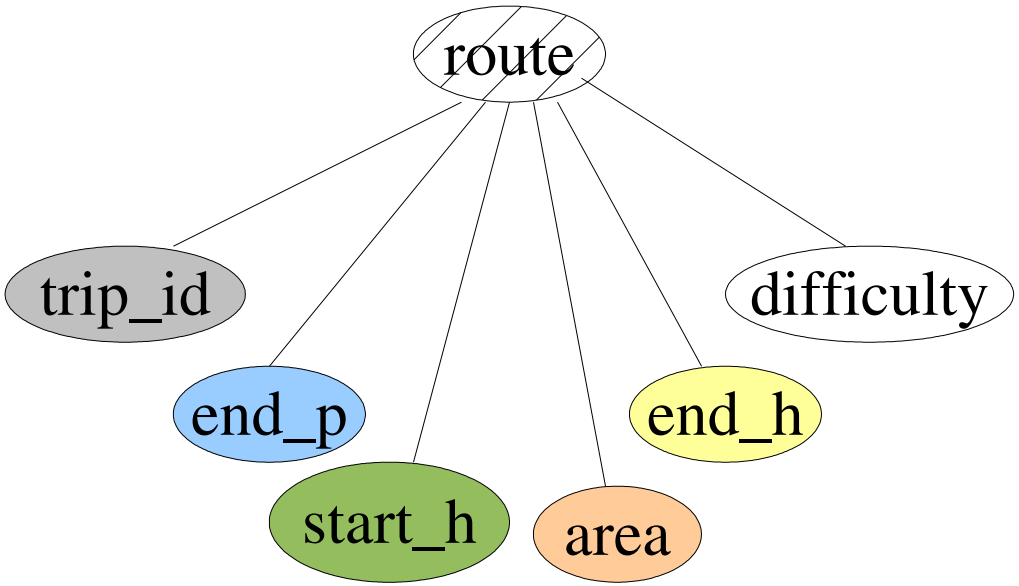
Autonomous and heterogeneous services:
hard problem!

Ontology based approach

```
<item>
  <id>5947</id>
  <top>Monte Cevedale</top>
  <region>Ortles</region>
  <exposure>W</exposure>
  <base_height>2600</base_height>
  <top_height>3757</top_height>
</item>
```

```
<route>
  <trip_id>2109</trip_id>
  <end_p>Cevedale (Monte)</end_p>
  <area>Alto Adige</area>
  <difficolty>BSA</difficolty>
  <start_h>2610</start_h>
  <end_h>3757</end_h>
</route>
```





Lexicon based approach

A lexicon holds associations <*label, object*>

Simple reference system

```
<item>
  <id>5947</id>
  <top>Monte Cevedale</top>
  <region>Ortles</region>
  <exposure>W</exposure>
  <base_height>2600</base_height>
  <top_height>3757</top_height>
</item>
```

label	object
L1	5947
...	...

```
<route>
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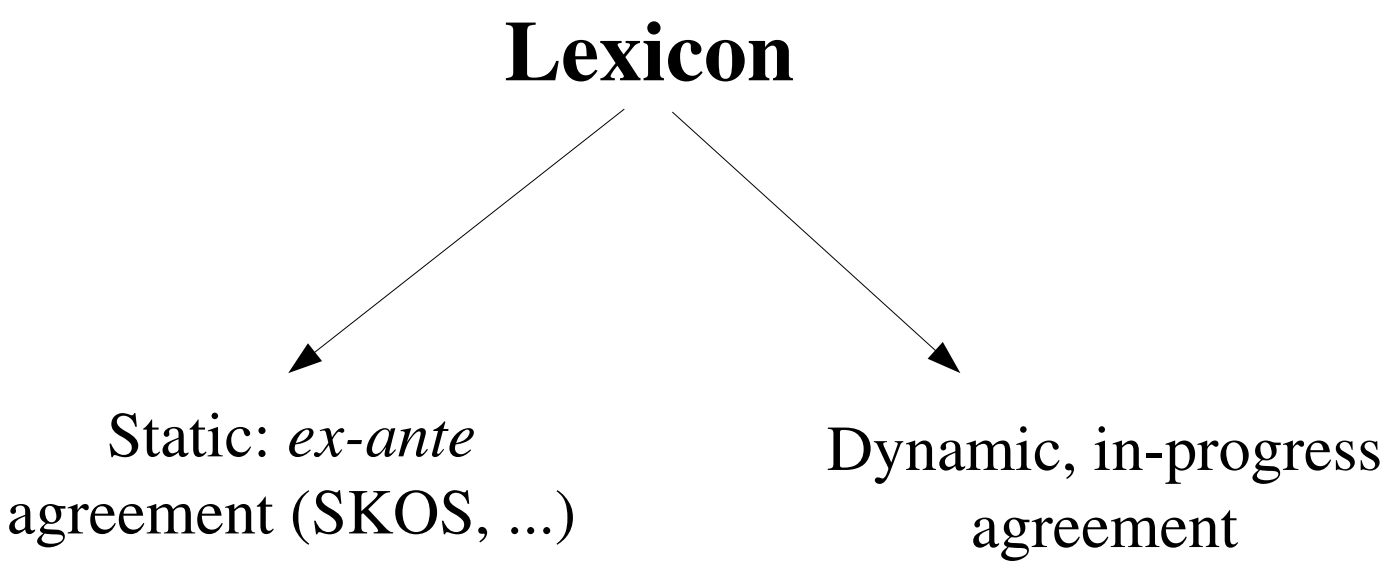
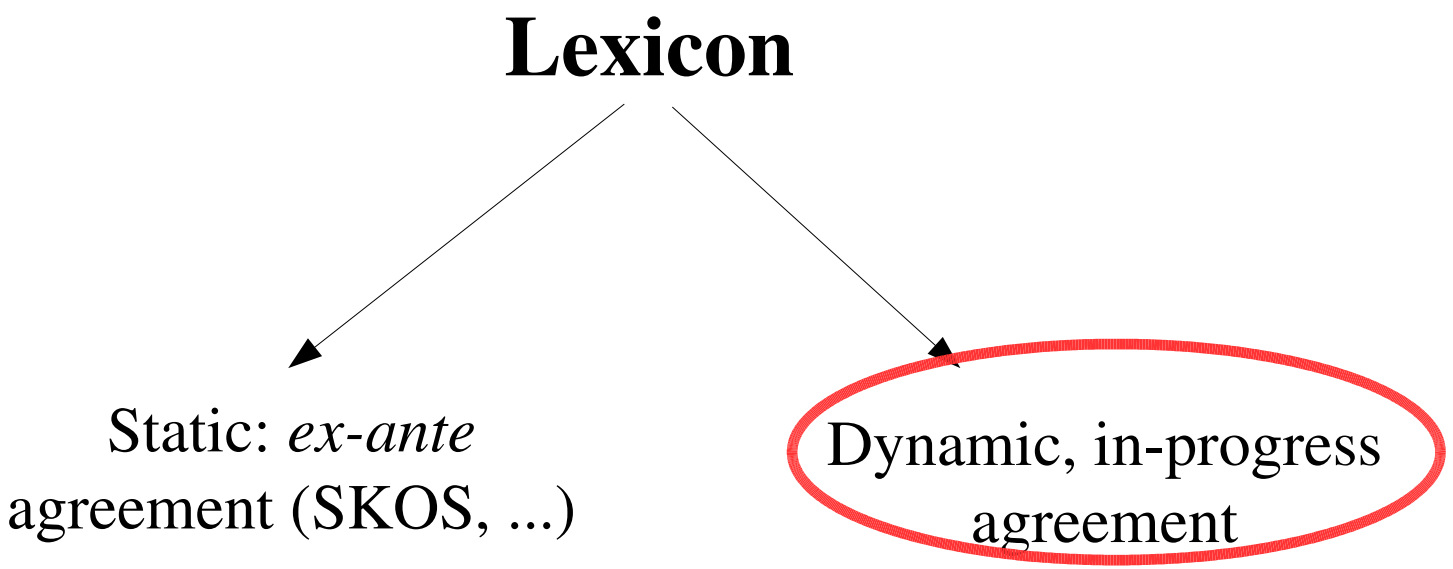
label	object
L1	2109
...	...

Lexicon


Lexicon
Static: *ex-ante* agreement (SKOS, ...)
Dynamic, in-progress agreement

Lexicon


Lexicon
Static: *ex-ante* agreement (SKOS, ...)
Dynamic, in-progress agreement

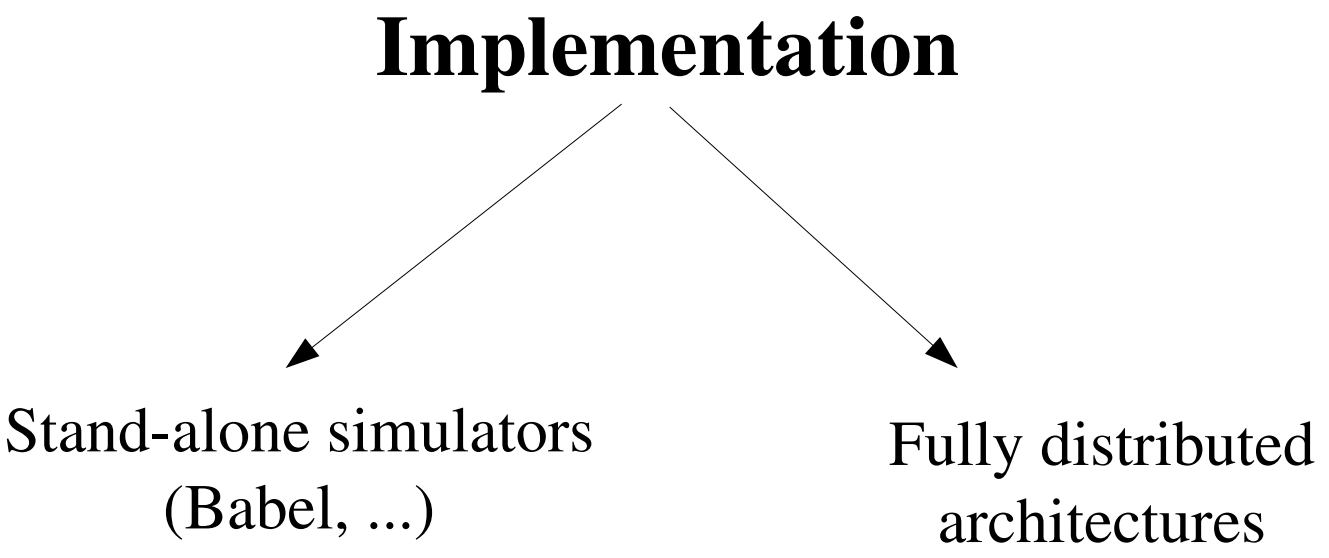
Language games model

Language games: **series** of **adaptive** interactions among peers that allow a common lexicon to emerge and continue to evolve.

Characteristics:

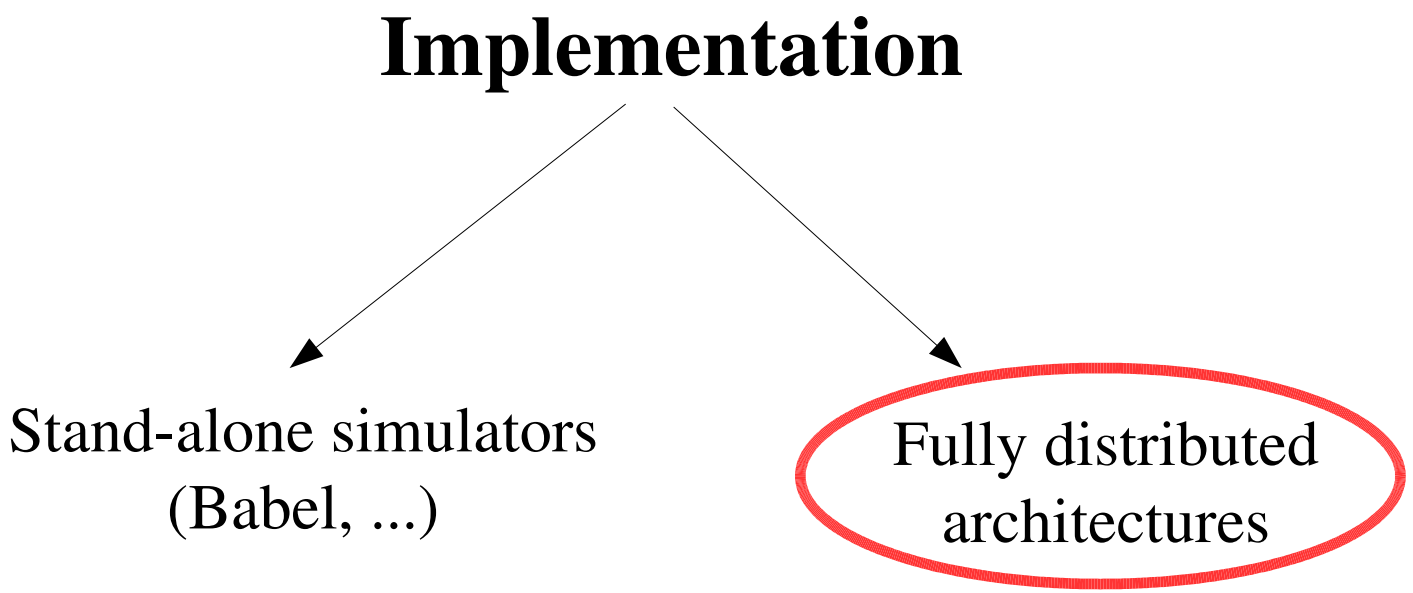
- **Coevolving** process
- **Distributed** process

Model implementations



Up to now, only simulators available

Model implementations



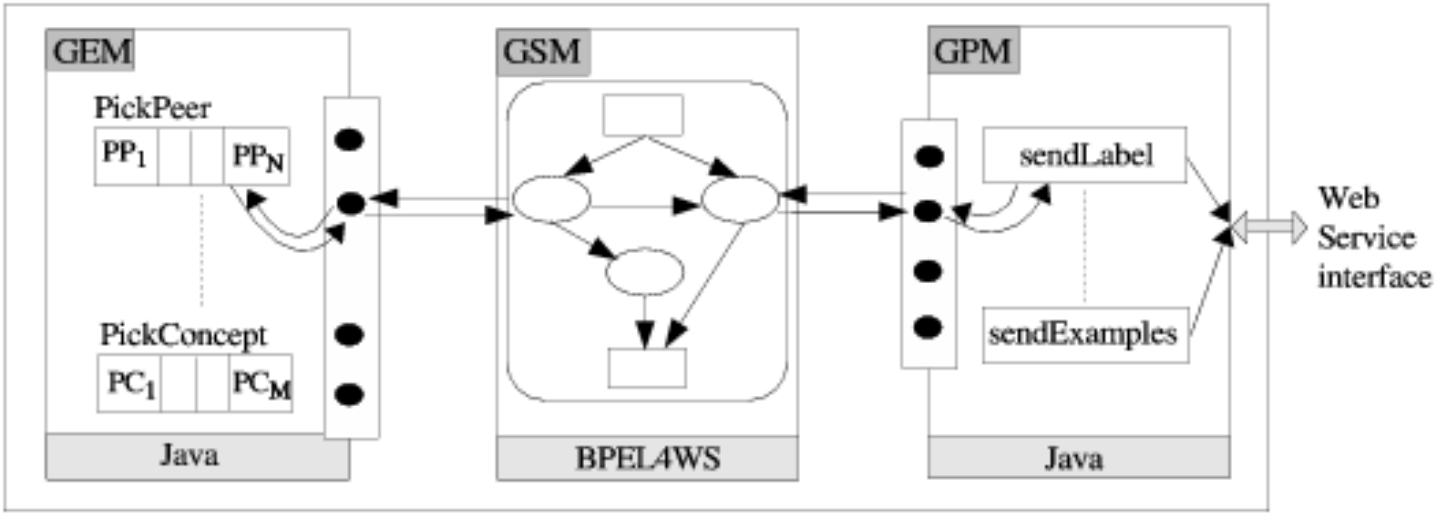
Up to now, only simulators available

Solution requirements

- Minimize *ex-ante* **agreement**
- Preserve **autonomy**
- Make possible **evolution**
- Avoid single **centralized** point of failure

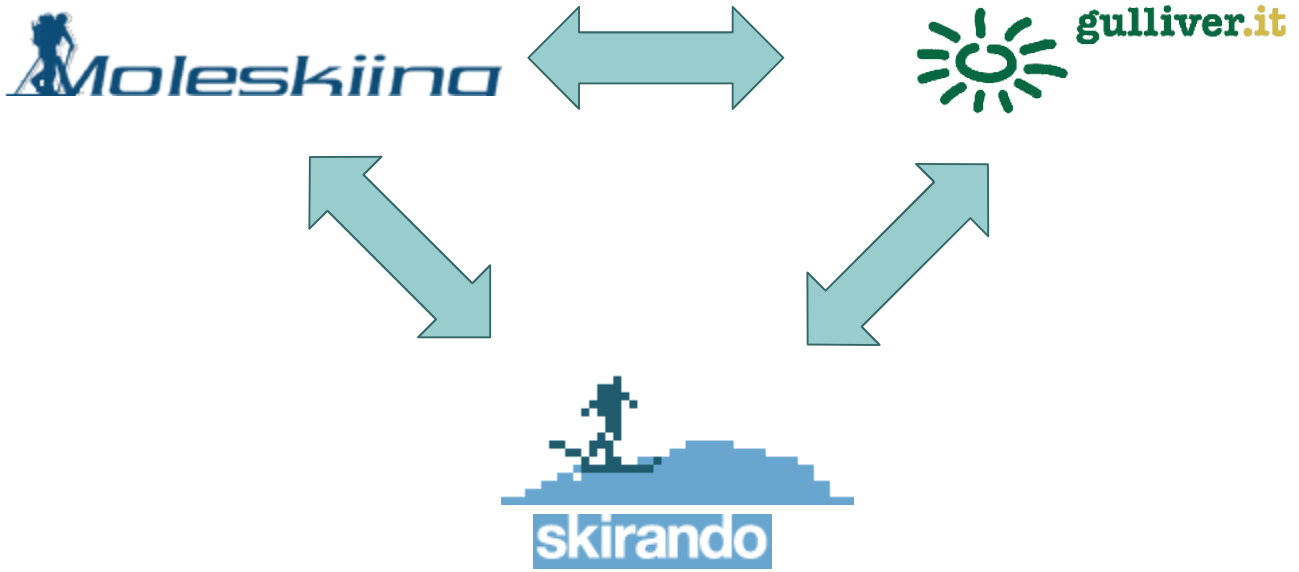
Implementation

3 layer service oriented architecture:



Component	*Autonomy*
Game Engine Module	High
Game Strategy Module	Medium
Game Protocol Module	Low

An application



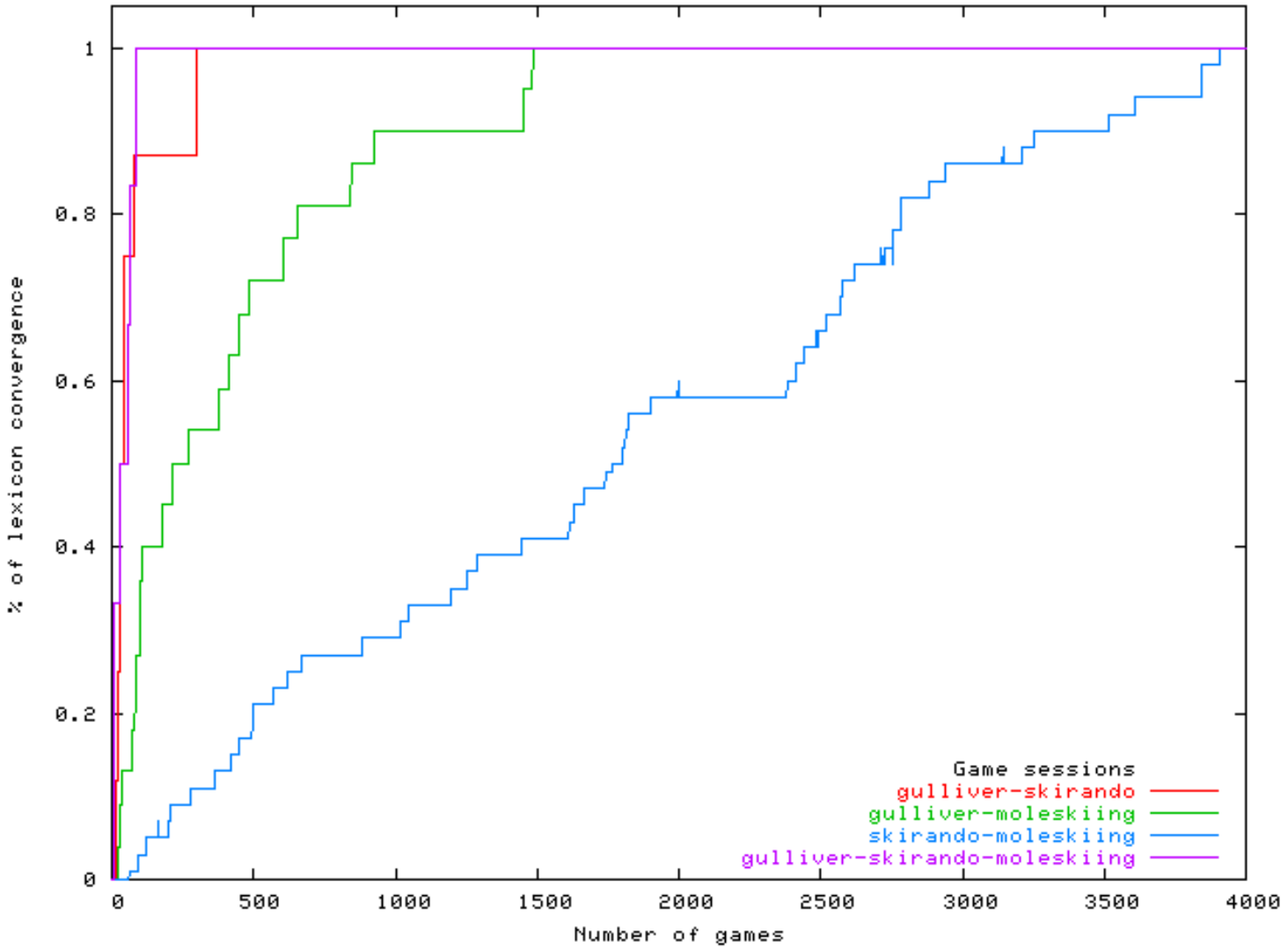
- 3 ski mountaineering online communities
- Services: ski routes catalog and ski trips annotations
- Goal: **distributed sharing of heterogeneous annotations**

Conclusions

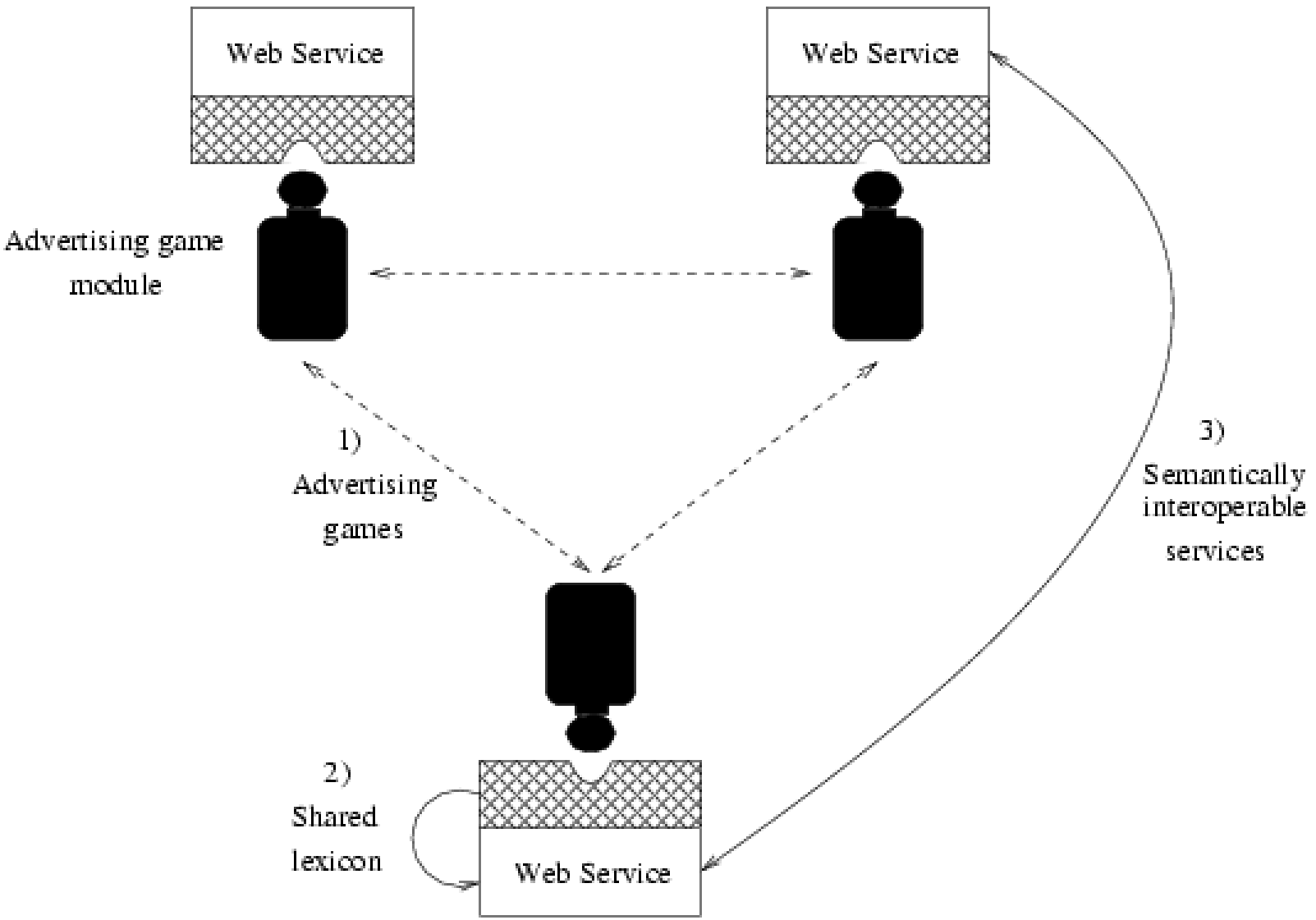
Contributions:

- Design of a component that brings the advertising games technique in a fully distributed environment;
- Implementation of this component for the web service world;
- Initial testing.

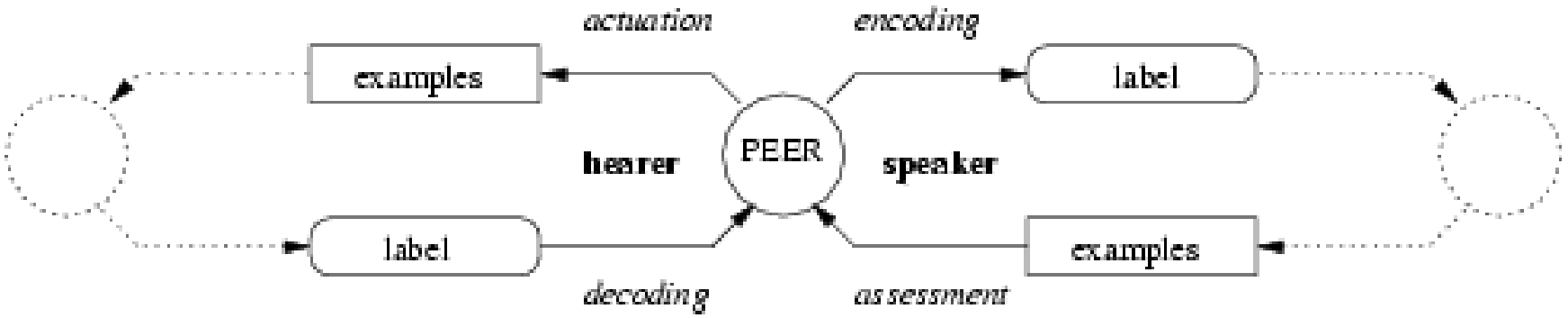
Does it work?


% of lexicon convergence
Number of games
0
0.2
0.4
0.6
0.8
1
0
500
1000
1500
2000
2500
3000
3500
4000
Game sessions
gulliver-skirando
gulliver-moleskiing
skirando-moleskiing
gulliver-skirando-moleskiing

Architecture

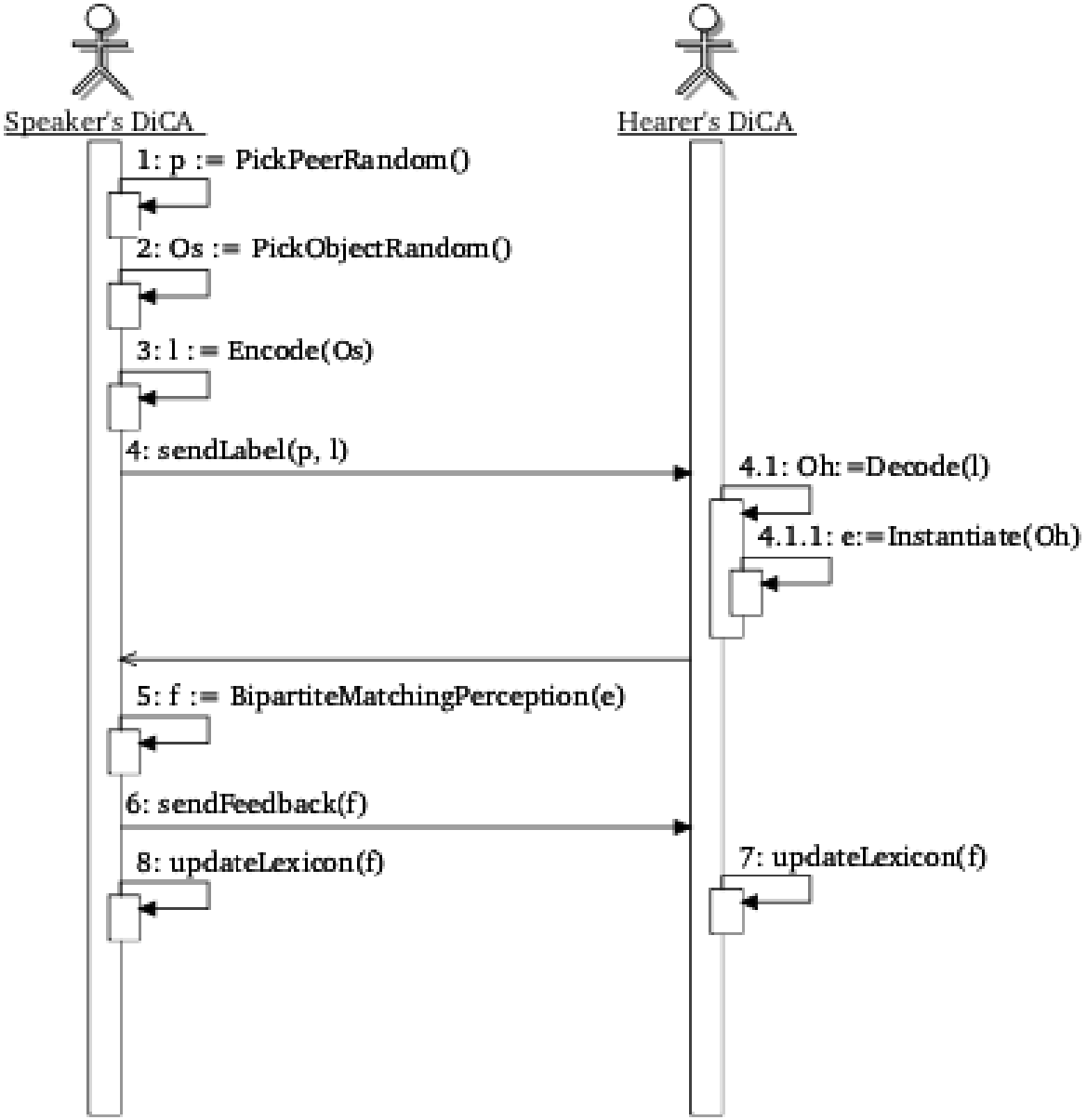


Advertising games illustrated

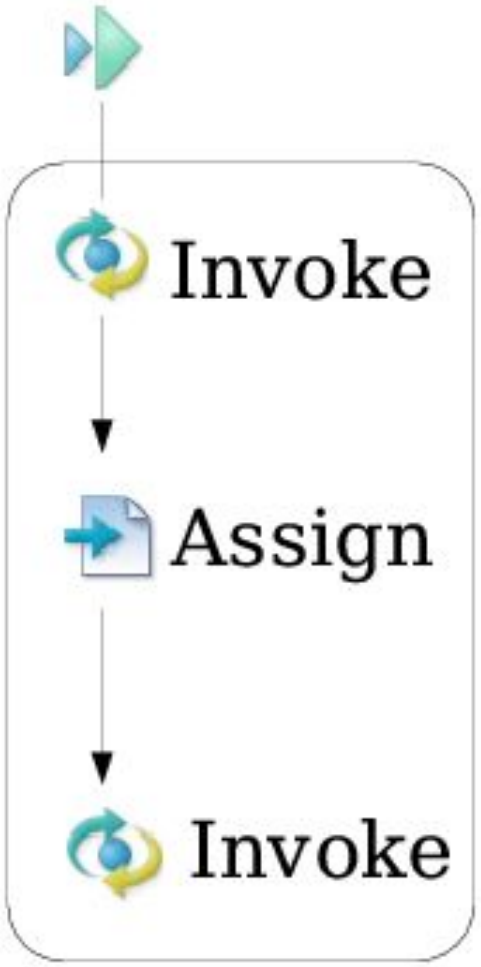


- *Encoding*: what is the best label for a concept?
- *Decoding*: what is the best concept for a label?
- *Actuation*: get the examples that exemplify a concept
- *Assessment*: do the examples fit the original concept?

An advertising game session



BPEL4WS



1) Invoke a primitive operation (in GEM)

2) Manipulate the result

3) Invoke a communication primitive (in GPM)