Web Services Compositions

1. Requirement
2. User's request and response
3. Component – Web Service Compositions
4. Issues

Requirement

- We want to build a Web Service Composition system that can perform automated processing of web services by machines, where all the services have well defined meanings

User's request and response

- Users provide INPUT –
  - How can system understand users' INPUT ?
  - Example INPUT: species name list, taxons, etc.
- Users require Designed OUTPUT . For example : tree
  - How can system understand users' OUTPUT
- INPUT and Designed OUTPUT have to encode to Logic Programming and Ontology (OWL)

Components

- 1. Web Services
  - We have a collection of web services
  - Each web service has an description (WSDL)
  - Each web service has an semantics (OWL – Ontology)
  - In order to use planning, each WSDL file has to convert to Logic Programming format
  - In order to use composition, each WSDL file has to integrate semantics.

Components

- 2. Web Services Registry
  - We built a Web Services Registry that used to store information of Web Services.
  - The most important thing of Web Service information is WSDL file that used to describe about Web Service's operations and how to invoke them.
  - At the moment, Web Service Registry is hosted in NMSU Phylotastic Server. It is still simple Web-based application with an Database that stores Web Service information and WSDL

Components

- 3. Search Engine
  - We have not implemented it yet. But we have expected to build a search engine that can automatically locate appropriates web services.

Components

- 4. Web Services Compositions/Execution

  4.1 : Web Service Execution : Execute Workflow that is discovered from WS compositions

  4.2 : Web Service Composition: Generate Workflow based on Web Service components and their description/meanings.

Components

- 4.1 : Web Service Execution
  - We have built a computer program that can execute an Web Service operation based on WSDL file, operation, its parameters.

Components

- 4.2 : Web Service Composition:
  - Discover Services : Effective way to discover web services
  - Composite Services : Composite by planning problem

Issues

- 1. Ontology – Semantics – Meanings
- 2. User Interactivities :
  - How to specify what users want ?
  - Visualization
- 3. Generate Workflow:
  - Answer Set Programming
  - Discover
  - Reliability : How to ensure that Workflow is correct ?
  - Preferences
  - Constraints: Conditions to generate the workflow (limit results, change priority services, etc.)

Issues

- 4. Contingency
  - Failure in generation: How to re-generate Workflow again ? How to bug the mistake and reduce workload for this process
  - Failure in execution: How to roll-back ?
- 5. Output:
  - Explanation : Describe detail information for the workflow
  - NLP : Generate Workflow as English language