



Collaboration and Knowledge Sharing in Grid Applications

Michal Laclavik
Institute of Informatics, SAS
Slovakia



Overview

- Applications
- Motivation, history
- Experience Management Approach
- EMBET Architecture
- Ontology
- GUI
- Examples



Objectives, Application of the system

- Collaboration among users
- Knowledge Sharing
- Recommendation

- Representation of Experience or Knowledge
 - Text Notes



Motivation, problem area

- In Pellucid IST Project
 - Active Hint approach
 - AH = **action** on **resource(s)** in **context** + **explanation**
 - Many AHs in Pellucid:
 - **See Text Note** in this **context** because **is useful**
- In K-Wf Grid project
 - Need for sharing of expert knowledge
- Text Notes
 - Natural way for people
 - If we are able to detect context of note - note can help others better than other formalized knowledge
 - People like to enter notes or memos to remind something to themselves or others



Research Challenges

- Experience (Knowledge) Management
- Text Processing
- Knowledge, Semantic, Ontologies
- Semantic Annotation
- Domain Models (Flood Prediction, Traffic Simulation, ...)
- User Interaction
- Knowledge Relevance, Problem detection



Use In Grid Application

- Detection of Appropriate ...
 - WSRF Services from user text input
 - Expected Output data
- It returns ontology concepts (semantic info) for workflow construction
- Collaboration and Knowledge Sharing
 - Knowledge inserted by users about models, services, data, application ...
 - Active provision of knowledge when needed



Experience Management Approach

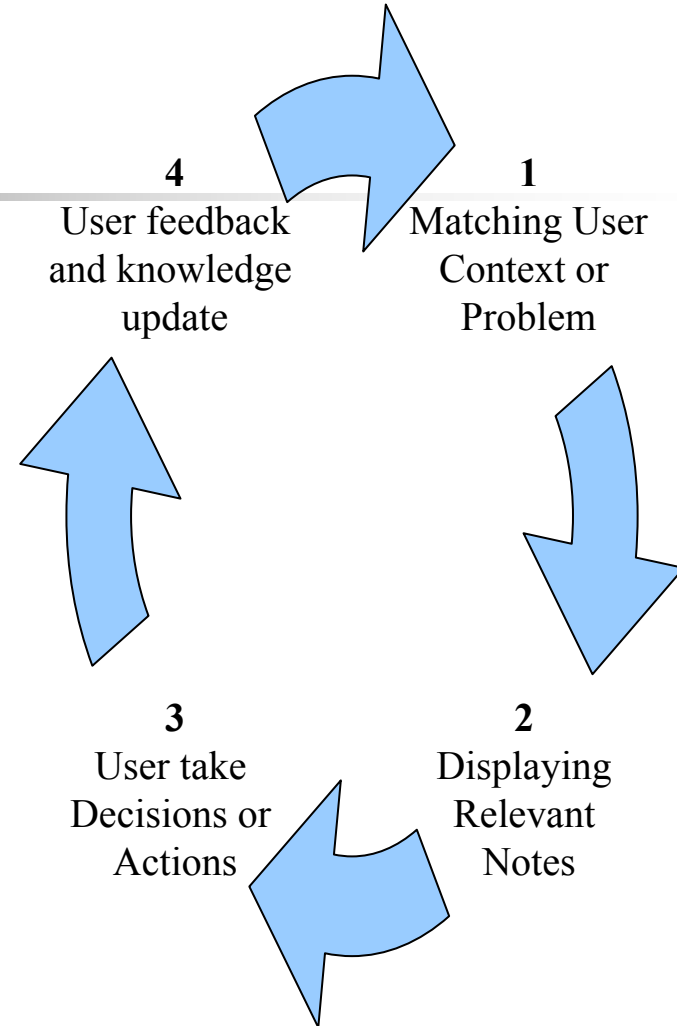
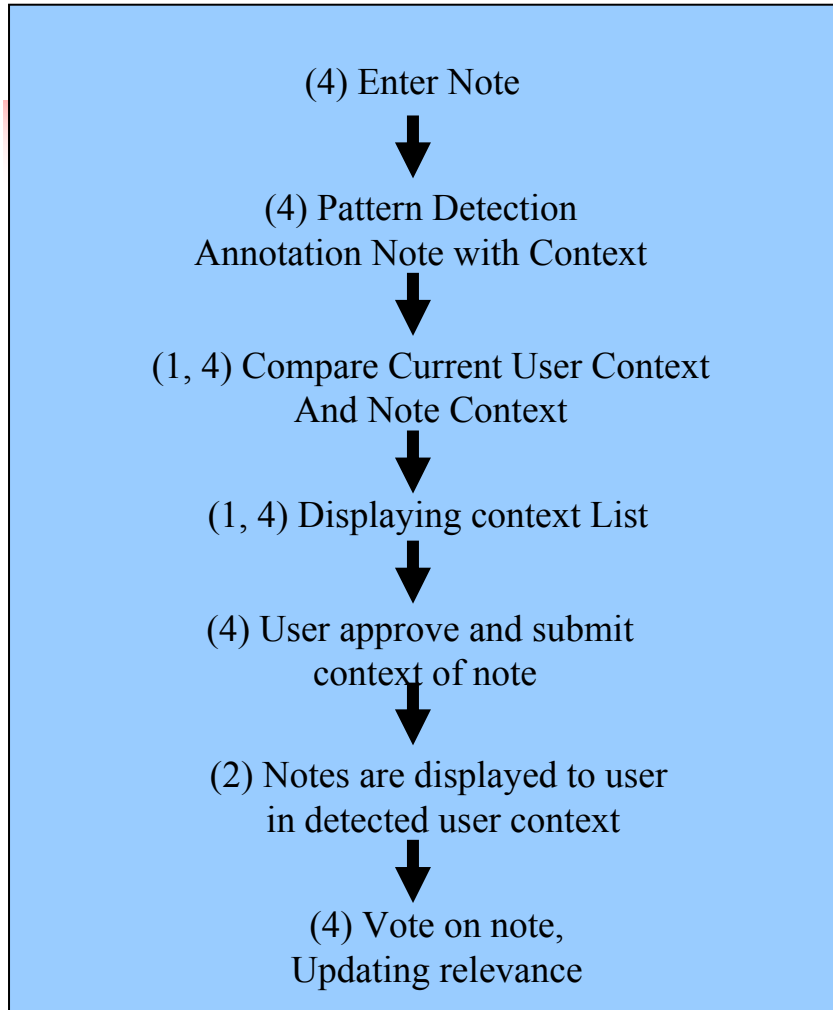
- Problem p
- Problem Space (P)
- In EMS Case-Lesson pairs (c, l)
 - Case Space (C)
 - lesson space (L).
- maps problem space to case space
 - $c = f(p)$



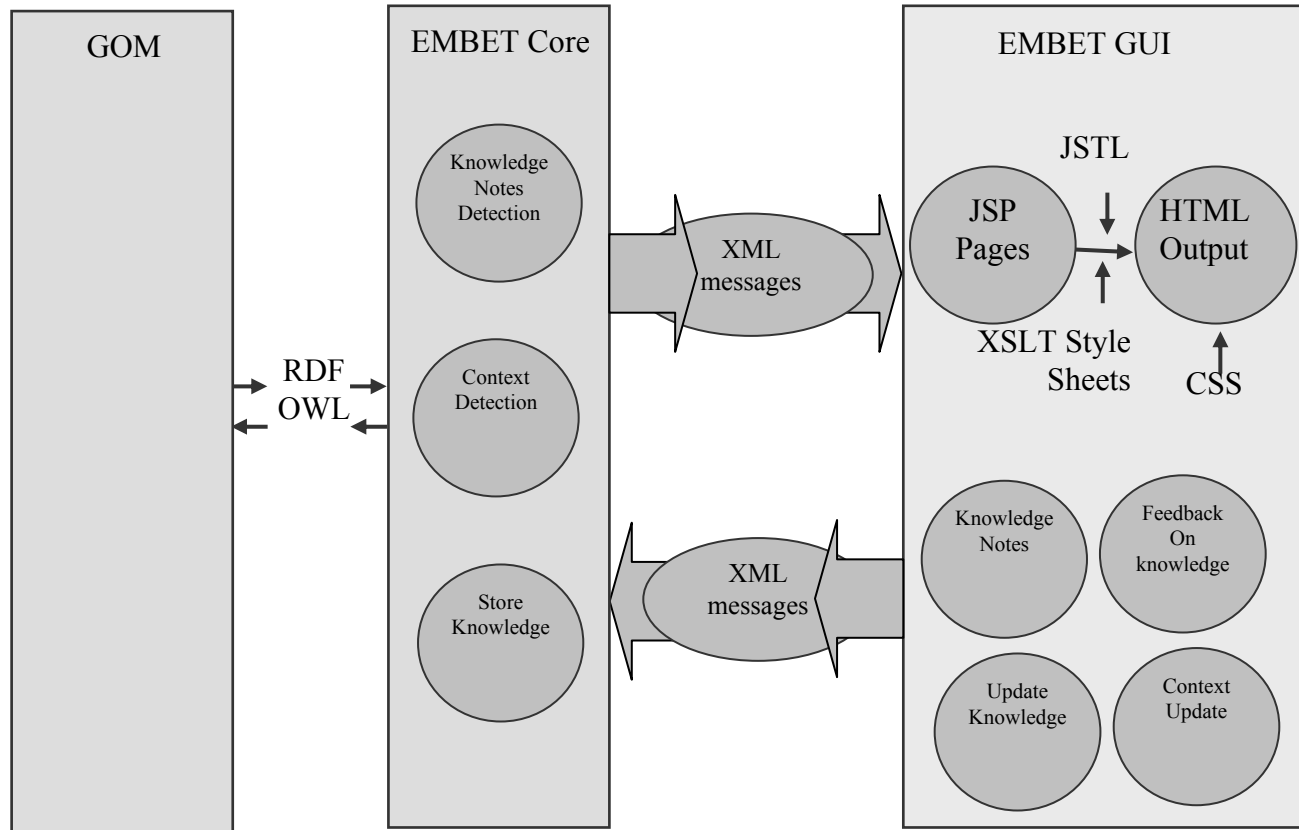
General vs. EMBET Approach

- General EM Approach
 - Characterize a problem
 - Transform the problem from the space P to the space C .
 - Choose from the cases the most "useful" lesson from the case-lesson pairs stored in the database
 - Apply that lesson.
- EMBET EM Approach
 - User context detection from environment which describes problem P
 - Our Model is described by ontology and Notes are stored with associated context, which describes space C
 - Notes represent learned lesson L which is associated with space C (note context). The note context is matched with a user problem described by the detected user context. The user context is wider than the note context and as a result all applicable notes are matched and returned.
 - Applying the lesson is left to the user by reading appropriate notes.

Knowledge Cycle



Architecture and GUI



The screenshot displays two web interface windows:

- User Context:** Shows user information for **Zoltan Balogh** (KWF-GRID member), a timestamp of 14/03/2005 14:35:26, and a flood forecast for 11/03/2005. The forecast details include: "Choosing meteorological model", "Area - Zilina/Bytea", and "Priority: cost/reliable/fast".
- User Assistant:** Displays a list of system messages and user feedback:
 - Aladin-failed:** (80%) 12 votes. By: Michal Laclavik (02/03/05). Note: Aladin execution hangs up during processing dataset.12-05-04.dat.
 - Aladin model suitability:** (62%) 7 votes. By: Ondrej Habala (18/02/05). Note: Aladin model isn't suitable for meteorological prediction in months with average temperature above 18°C.
 - Deprecated service:** (45%) 5 votes. By: Zoltan Balogh (12/02/05). Note: Service Aladin-0221 becomes deprecated due to new improved instance Aladin-0223.
 - Aladin model failed:** (35%) 9 votes.
 - Model recommendations:** (32%) 6 votes.

Example of Use – Adding the Note

User Assistant

Michal Laclavik **public**

- September (Month)
- Bratislava (Location)
- MM5 Meterology service (MeterologyService)
- DaveF Visualization Service (VizualizationService)
- DaveF Hydraulics (HydraulicsService)

Notes

- MM5 is not good service for Bratislava area in September
By: Michal Laclavik (23.08.2005 10:52:22)
- DaveF calibration data for Bratislava need to be changed because result differ from reality 10-30%
By: Emil Gatial (23.08.2005 11:02:07)

http://portal.ui.sav.sk: 8080 - Add note for...

NoteID: note1124786121014

MM5 is not good model for Bratislava in September

Done

http://portal.ui.sav.sk: 8080 - Approve not...

Nitra(Stream)	<input type="checkbox"/>
Nitra(Settlement)	<input type="checkbox"/>
MM5 Meterology service(MeterologyService)	<input type="checkbox"/>
Location(Class)	<input checked="" type="checkbox"/>
Bratislava(Capital)	<input checked="" type="checkbox"/>
September(Month)	<input checked="" type="checkbox"/>
Bratislava(Location)	<input checked="" type="checkbox"/>
Bratislava(Settlement)	<input checked="" type="checkbox"/>
MeterologyService(Class)	<input checked="" type="checkbox"/>
MM5 Meterology service(MeterologyService)	<input checked="" type="checkbox"/>

Submit

Done

Example of Use – Definition of Problem

User Assistant

Michal Laclavik public

September (Month)

Bratislava (Location)

MM5 Meterology service (MeterologyService)

DaveF Visualization Service (VizualizationService)

DaveF Hydraulics (HydraulicsService)

Notes

MM5 is not good service for Bratislava area in September

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http://portal.ui.sav.sk:8080 - Add proble...

ProblemID: problem1124797382440

flood and weather prediction for Bratislava in September

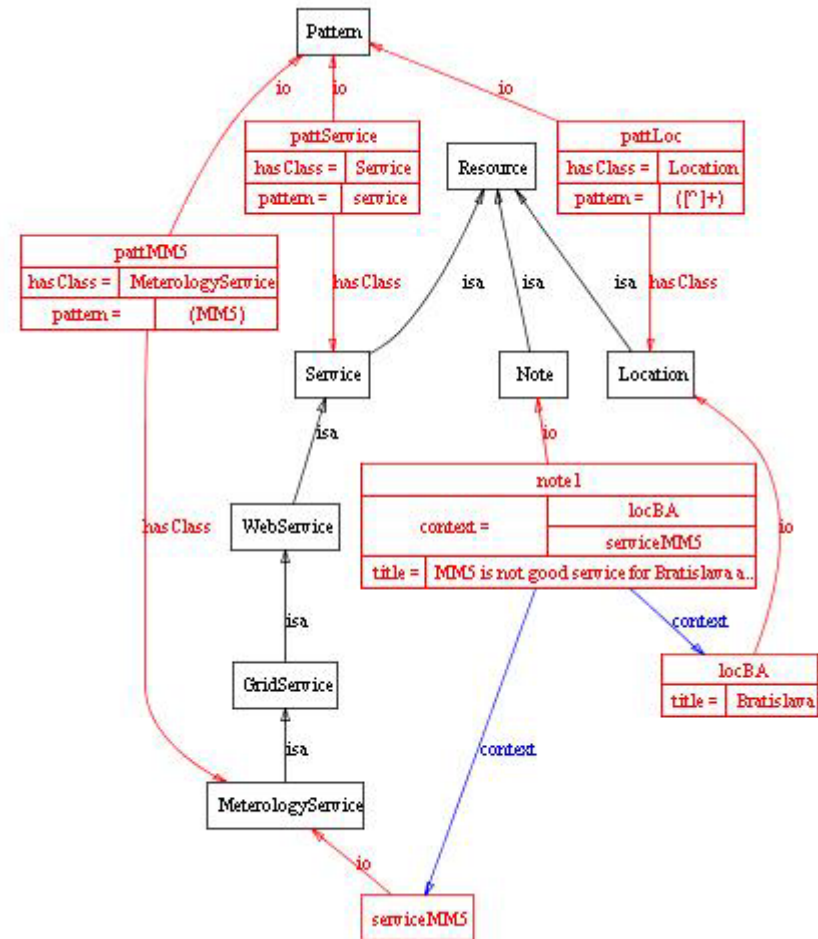
http://portal.ui.sav.sk:8080 - Approve proble...

Nitra(Stream)	<input type="checkbox"/>
Nitra(Settlement)	<input type="checkbox"/>
MM5 Meterology service(MeterologyService)	<input checked="" type="checkbox"/>
Bratislava(Location)	<input checked="" type="checkbox"/>
Location(Class)	<input type="checkbox"/>
DaveF Hydraulics(HydraulicsService)	<input checked="" type="checkbox"/>
MM5 Meterology service(MeterologyService)	<input type="checkbox"/>
Bratislava(Settlement)	<input type="checkbox"/>
DaveF Visualization Service(VizualizationService)	<input checked="" type="checkbox"/>
September(Month)	<input checked="" type="checkbox"/>
Aladin Visualization Service(VizualizationService)	<input type="checkbox"/>
Aladin Meterology Service(MeterologyService)	<input type="checkbox"/>
flood(Problem)	<input type="checkbox"/>
Bratislava(Capital)	<input type="checkbox"/>

Submit

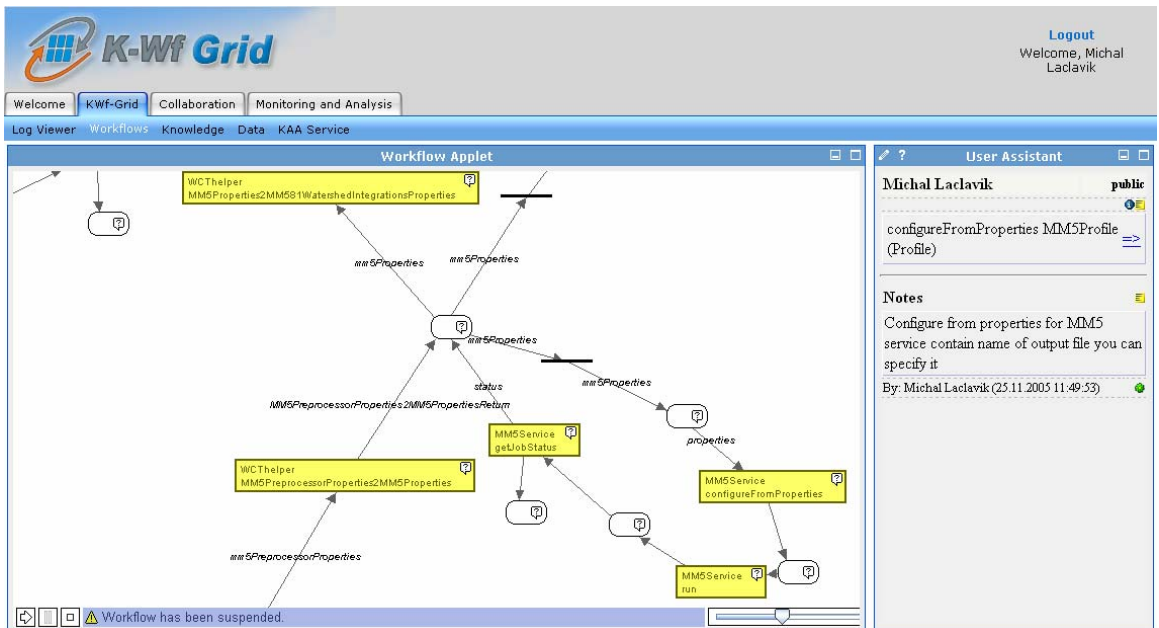
Ontology

- Text of note is matched by regular expressions
- Domain (Application) elements described in ontology model are detected



Major Outcomes/Results

- EMBET is system for:
 - User Problem Definition
 - Experience Management
 - Collaboration
 - Knowledge Sharing





Conclusion and outlook

- Tested and Evaluated on:
 - Pellucid IST Project
 - K-Wf Grid IST Project
- Can be used also in non Grid application
 - Intranet Systems
 - CRM, ERP
 - Systems which can communicate Context
- Customization
 - Domain Ontology Model (main resources in the domain)
 - Interface communicating context/problem of the user



Thank you !

Michal Laclavik
Institute of Informatics, SAS
Slovakia