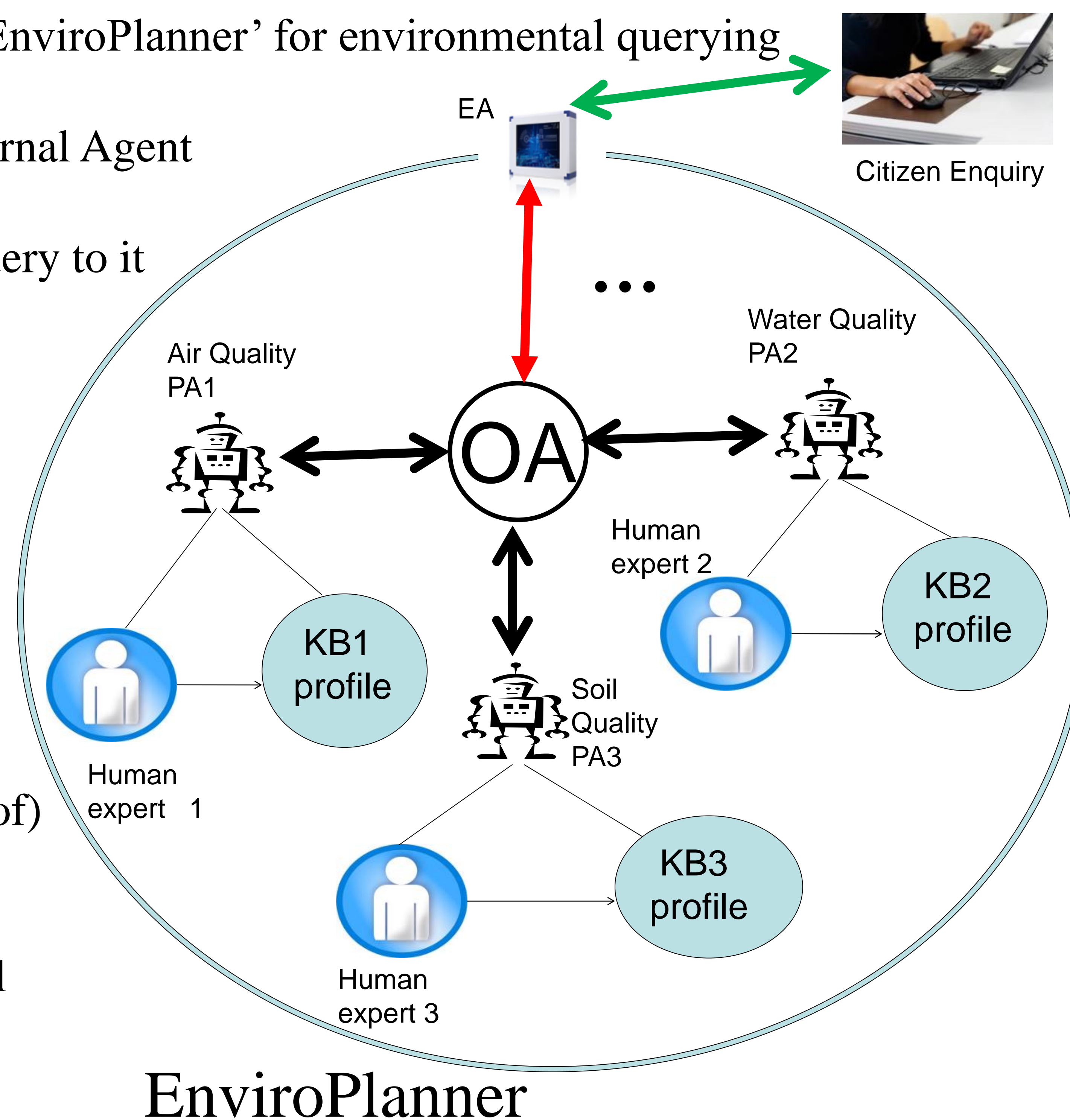


EnviroPlanner: A Rule Responder for Distributed Environmental Querying

Sujan Saha, Harold Boley, and Gerhard Dueck

Rule Responder Instantiation: EnviroPlanner

- Rule Responder is a service-oriented architecture used for automated rule-based collaboration
- We present a new Rule Responder instantiation called ‘EnviroPlanner’ for environmental querying
- Organizational Agent receives RuleML query from External Agent
- OA identifies Personal Agent for query and delegates query to it
- PA uses its local Knowledge Base to derive solution(s) for response(s) to OA, which answers to queries via EA
- PA assists a human expert with help of his/her KB
- EA is point-of-contact that allows citizen to query Virtual Organization about environmental issues
- EnviroPlanner currently focuses on queries about (part of) New Brunswick
- Ultimately, EnviroPlanner should permit environmental query answering in support of an NB Virtual Organization



Agents:

- Organizational Agent (OA) of Virtual Organization (VO) identifies best Personal Agent (PA) for incoming query via Responsibility Assignment Matrix
- Personal Agent (PA) assists human expert of VO. PAs run rule engine to interpret local Knowledge Base (KB) of facts and rules to derive response(s)
- External Agent (EA) is based on a Web interface that allows citizen to make queries, employing a menu-driven Web form, which gets translated to an equivalent RuleML/XML message

EnviroPlanner: Query Translation, Delegation, and Answering

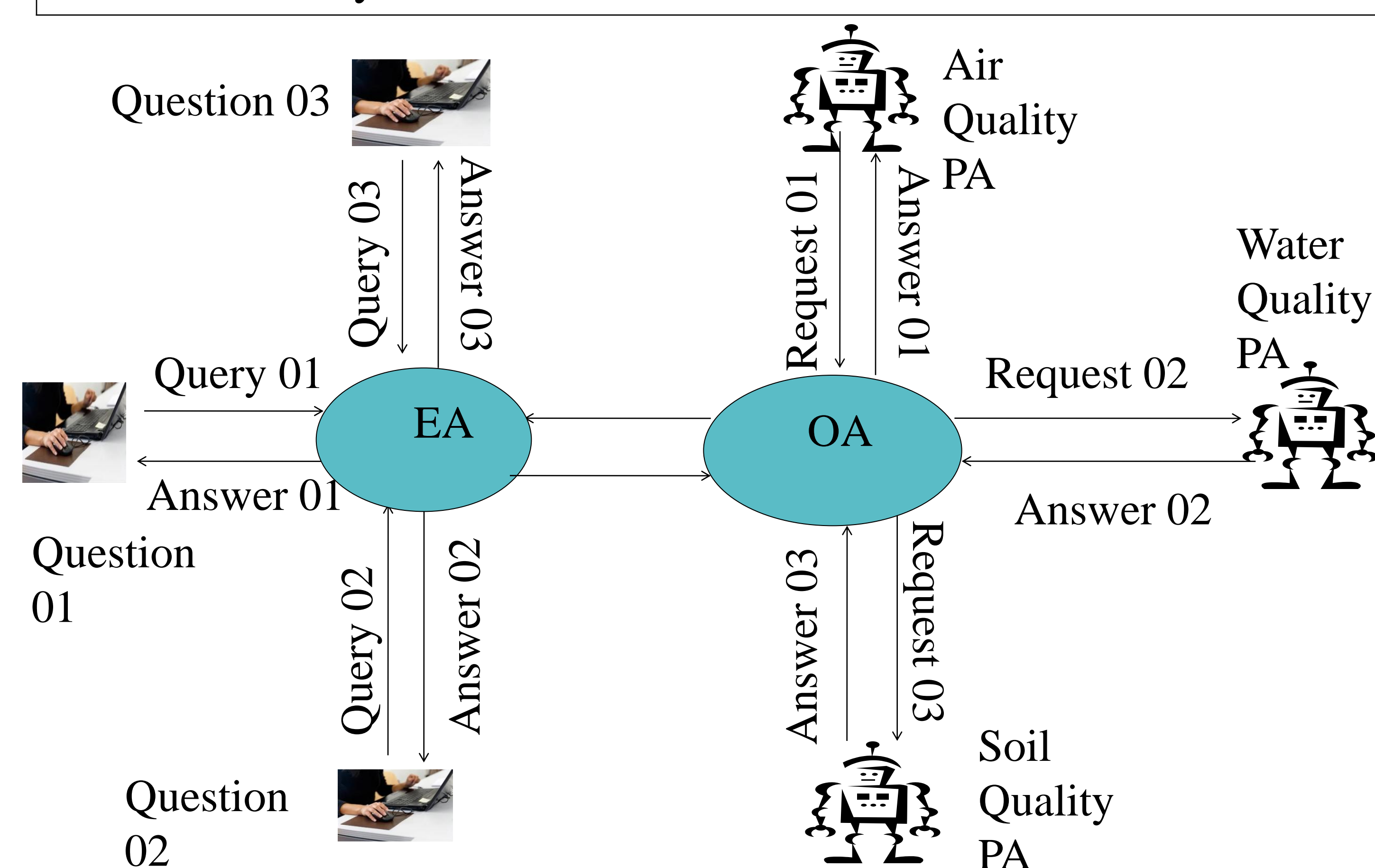
Query Translation

Rule Responder uses messages in Reaction RuleML for interchange, which can be queries, answers, or rule bases

Agents interpret content of a Reaction RuleML message and translate RuleML to language of local rule engine (e.g. N3)

Examples of Environmental Queries

1. Who is the contact responsible for air quality issues?
2. How to get water quality information?
3. What are the guidelines of composting? [soil]
4. Are there any toxic soil substances?



Responsibilities Assignment Matrix

- Roles of PAs within VO managed through Responsibility Assignment Matrix
- Matrix maps *queries* about air, water, soil, ... to respective *name* of air, water, soil, ... PA
- Matrix defined by an OWL Lite Ontology

	PA 1	PA2	PA3	...
Air quality queries	Responsible			...
Water quality queries		Responsible		...
Soil quality queries			Responsible	...
...