



Let agents do the work: new digital preservation concepts from the PROTAGE project



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8th European Conference on Digital Archiving
Geneva 28 – 30 April 2010



Topics

- The case for sharing the digital preservation know-how
- Introducing intelligent software agents
- The Protage project
- Conclusions - application of agent technologies in digital preservation



The Digital Preservation Riddle

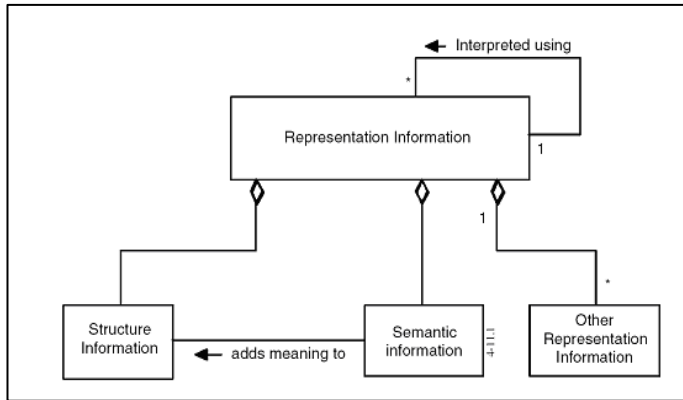
Metadata

Storage media

File formats

Preservation planning

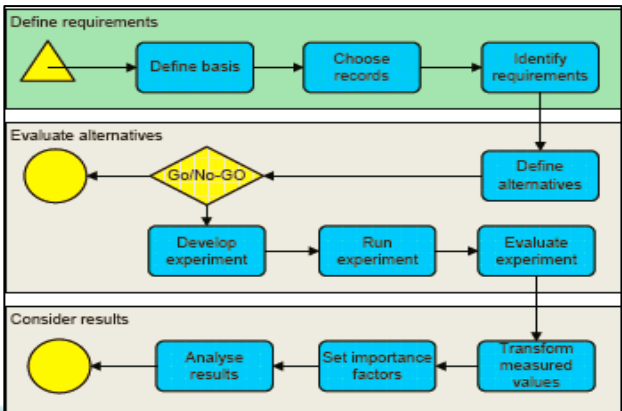
Representation information



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Agents

*An agent is a computer system
that is capable of independent action
on behalf of its user or owner
(figuring out what needs to be done to satisfy design
objectives, rather than constantly being told)*

(Jennings 1998)

Agents

- Key characteristics of agents:
 - Autonomy: an agent is able to take action without human interaction
 - Sociality: an agent is able to solve complex problems through the interaction with other agents and systems
 - Reactivity: an agent is able to react on changes occurring in its environment
 - Trust: agents need to apply trust models to know which other agents can be trusted and which are suitable when trying to solve a particular agent's problem



The PROTAGE project

- **PReservation Organisations using Tools in AGent Environments (PROTAGE)**
- A three-year STREP co-funded under FP7 ICT Theme 4.1 Digital libraries and technology-enhanced learning (Contract no. 216746)
- Period: November 2007 – October 2010
- Task: to investigate and initiate complementary new approaches to digital preservation



Consortium



National Archives of Sweden, Coordinator



Luleå University of Technology (Sweden)



National Archives of Estonia



Fraunhofer Gesellschaft zur Förderung der angewandten Forschung e.V. (Germany)



University of Bradford (U. K.)



EASY Innova S.L. (Spain)



Giunti Labs S.r.l. (Italy)



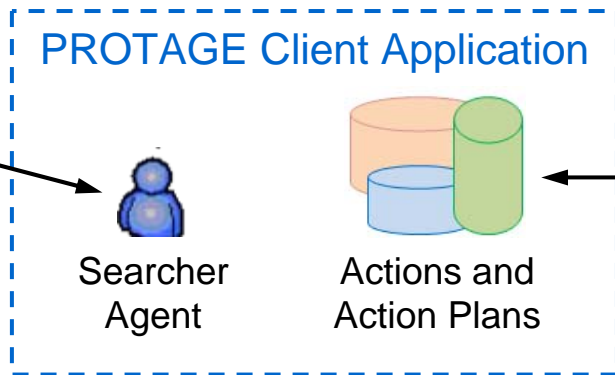
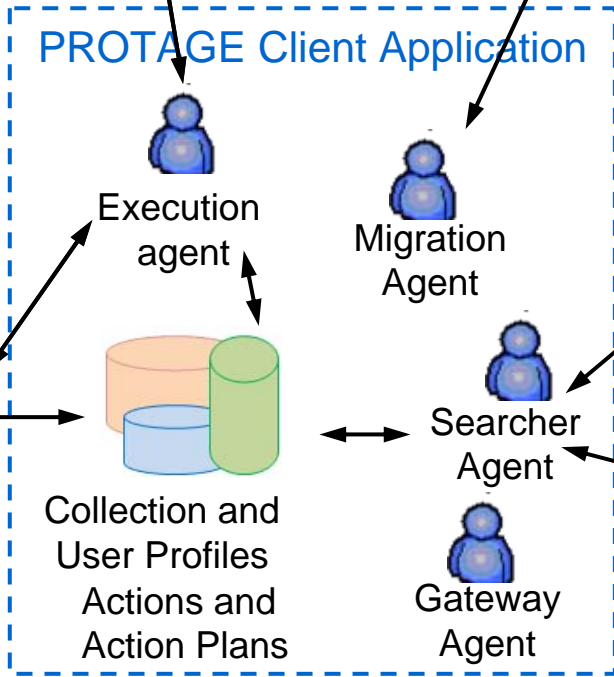
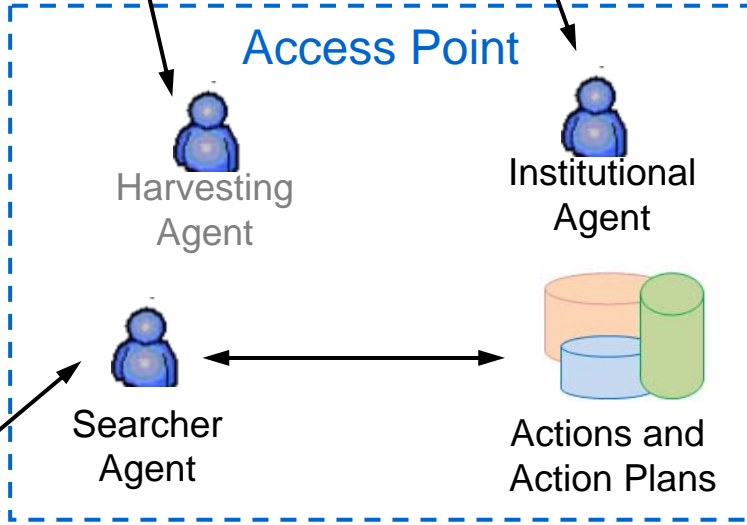
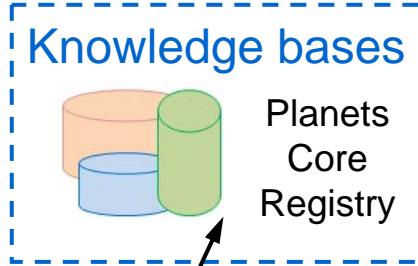
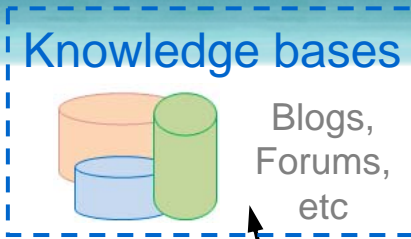
Objectives

- Study the potential of software agents to support the automation of digital preservation tasks
- Demonstrate technical feasibility of such a system
- Analyse its implementation in different organisational environments
- Explore possible integration with other digital preservation environments



Scope of Protage

- Targeted users
 - primary scope on individuals managing their personal data
 - extendable into corporate environments
- Targeted primary functionality
 - Extraction and monitoring of preservation needs
 - Context and trust based recommendations on managing the user's data in the form of preservation workflows
 - Execution of preservation workflows / preservation plans





Trust in Protage

- Trust inside the client (peer) environment:
 - Users initially have to specify their trusted Access Point
 - Users can search for and add trusted clients (peers)
 - Users can specify the depth of their trust chain (friends of friends of friends etc)
 - Users can rate and comment on Actions, Action Plans and other users / agents
- Trust inside Access Points
 - Access Points select trusted other Access Points
 - Access Points select and certify highly rated Actions and Action Plans
 - Access Points define external trusted Knowledge Bases



Trust in Protage

- Trust as used in queries: the Protage Trust Model
 - Users' trust settings
 - Similarity of collections
 - Similarity of users
 - Action and Action Plan ratings and certificates
 - User / Agent ratings
- Agents monitor users' habits (queries, execution, feedback) and further refine their trust profiles



Why Protage?

- Protage reduces the time needed to develop and evaluate preservation workflows by allowing simple reuse of knowledge created by other Protage users
- Protage agents automatically detect new knowledge added to external knowledge bases
- Protage agents are fully scalable and simple to implement in a variety of environments
- Protage is able to monitor and adapt to changes in user's habits, collection and external environment



Implementing Protage

- Protage prototype as part of other systems:
 - Personal collection management (photo, audiovisual collections)
 - Digital repository ingest, storage and preservation management functions
 - Storage systems and controllers
 - Bundled with antivirus tools
 - Etc



Future of Protage

- Final (3rd) prototype due in May 2010
- Final tests: June 2010
 - Including large-scale user testing in LivingLab Botnia
- Evaluation of tests, prototype and the development: July – August 2010
- Recommendations on using agents in digital preservation (Final Report): October 2010



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