An Intelligent Cooperative Information Retrieval System Based on Multi-Agency

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An agent can be defined as a hardware or (more usually) software based computer system that enjoys the following properties:

* autonomy: agents operate without the direct intervention of humans or others, and have some kind of control over their actions and internal state;

* social ability: agents interact with other agents (and possibly humans) via some kind of agent-communication language;

* reactivity: agents perceive their environment (which may be the physical world, a user via a graphical user interface, a collection of other agents, the Internet, or perhaps all of these combined), and respond in a timely fashion to changes that occur in it;

* pro-activeness: agents do not simply act in response to their environment, they are able to exhibit goal-directed behavior by taking the initiative.

A system compound of two or more agents is a multi-agent system.

A network of inter-operating information sources is often referred to as intelligent and cooperative information system.

This paper presents an intelligent cooperative information system, which is developed as a multi-agent system. User communicates with an agent (no matter which one) from the system using a web browser. User may add some article to the system, request for the particular article from the system or it may submit a query for the intelligent search of the articles. When adding a new article, meta information about the article have to be specified (keywords, author name, date, type of the article, etc.). These meta information will be used for intelligent search when a user asks for the list of the articles that best matches his/her specification. The system methodically distributes the articles over its agents, in order to facilitate the search. The system is extensible, new agents can be easily added as it grows.

The most attractive features of this information system are:

* multi-agent nature - there is no central part of the system that controls its overall performance. Its intelligence and control strategy emerges from agents cooperation and local policy.

* parallel distributed search - as opposed to less efficient centralized search done by WWW searching machine,

* distributed information acquisition - everyone can add articles (like in WWW)

* extensibility - from the prototype version it may grow into global system (such as WWW),

* robustness - if some agents are out of order the system continues its work with graceful degradation,

* platform independence - the system is implemented in Java 1.1 which is available for most operating systems.

The system resembles to a digital encyclopedia (such is The Britannica) and the World Wide Web. The Java classes used in the system implementation utilize the Internet for agent to agent communication. This means that system can be distributed all over the globe.