ASPIC Annual Report

ASPIC is focused on knowledge-based services for the Information Society, based on semantically rich logic formalisms called Argumentation Systems. Initially, ASPIC will develop a common framework to underpin the services that are emerging as core functions of the argumentation paradigm. These include reasoning, decision-making, learning and communication. The end goal is a suite of software components based on this framework and a development platform for integrating these components with knowledge (e.g. semantic web) resources and legacy systems. ASPIC will provide a sound basis for discussions of technical standards. ASPIC stresses the need to establish a formal foundation to support the creation, deployment and validation of practical argumentation systems and the core components will be developed using rigorous software engineering techniques.

Summary of Activities

The ASPIC project consists of a number of work packages (WP1 – WP7), which are referred to in the following summary of ASPIC activities completed within the first year of the project:

The ASPIC project has completed and documented surveys of theoretical models of argumentation (WP2), and the state of the art in tools, technologies and applications of argumentation (WP1). The surveys have helped requirements for ASPIC argumentation components (WP4) and user/market requirements for the ASPIC platform and applications (WP4 and WP5). A number of applications benchmark scenarios have been defined (WP1) providing impetus for theoretical work (WP2) and prototyping work (WP3).

A draft consensus for formal semantics of argumentation logics is currently being prepared (WP2). Consensus on inference has been achieved, with good progress on argument-based
decision-making and dialogue. Partners have published a number of research papers documenting this work.

The project is currently prototyping the above mentioned benchmark scenarios and is nearing completion on development of a prototype argument editor and visualisation tool (STAVE) (WP3). A feasibility study on possible integration of existing software from partners as a basis for the ASPIC technology platform has been completed, with promising results (WP4).

For the following year, the project is well positioned to consolidate the “pipeline” from WP2’s theoretical results to WP4 and WP5, via WP3, and deliver the first ASPIC platform to application partners for a first round of testing.

**Market Prospects**

A feasibility study of the potential for integration of Tallis (an argumentation based decision support tool for specifying and executing workflow management from Cancer Research UK - [http://www.acl.icnet.uk](http://www.acl.icnet.uk)) and GENESYS (a distributed agent infrastructure from NAVUS - [http://genesys.sztaki.hu/](http://genesys.sztaki.hu/)) has been promising, and the resulting system (“TalliSYS”) is being actively reviewed for short-term market opportunities. An anticipated result of the integration will be a platform for deployment of argumentation services to support key decision and commitment points in a distributed workflow environment. The aim is to provide a portfolio of intelligent business services for design and execution of complex enterprise integration solutions. The platform will help to organize enterprise solutions around shared scalable business services which parallel business processes. Application fields will be business sectors requiring implementation of complex scenarios: e-health, e-commerce, e-government, e-learning. The platform will help a business to increase significantly its responsiveness to changes in a highly dynamic business environment.

The STAVE argument editor and visualisation tool is comparable to a number of other experimental software packages, some academic, some commercial. We are currently integrating an “argumentation engine” into STAVE, which would give it unique functionality and might justify distribution on a “freeware” or possibly commercial basis.
User Requirements and Resulting Product Profile

The state of the art survey of argumentation based tools, technologies and applications include some 70 reviews, and provides a strong basis for identifying thematic requirements for argumentation technology. Applications range from situation and risk assessment, decision support, text and document retrieval and intelligent workflow to human computer interface design and computer supported cooperative work, in domains ranging from law and medicine to software engineering, computer gaming and e-Business. As part of the WP6 activity we are exploring possible product types and markets, and as the ASPIC platform evolves these explorations will continue into new areas of potential application while also focusing on the most promising areas of commercialization.

Technology Outlook and Innovative Features

Classical information systems provide users with sets of hopefully relevant answers to their queries. Decision-support systems may propose rank-ordered sets of possible choices to a decision maker. What argumentation methodology offers is a general framework that enables ASPIC to supply software components with facilities for explaining the advantages and limitations of the items retrieved or of the different options to be considered. Moreover, argumentation can also greatly benefit multiple agent group decision support systems, by enriching deliberation protocols with exchange of arguments between the agents, or in e-commerce by making negotiation more effective, by accompanying offers with relevant explanatory arguments in response to the preferences expressed by a potential buyer. Lastly, argumentation can be coupled with learning tools, either for obtaining more interesting rules by biasing the learning process through the introduction of examples augmented with arguments, or by computing arguments that are relevant for supporting some thesis from available data.

The Demonstrator

A key goal of the ASPIC project is to provide a platform that supports a range of argumentation services. As ASPIC components are developed, they will be integrated into this platform in order to evaluate their performance in distributed applications. We are developing a demonstration version of this platform for release to all project partners in January 2005. This involves the above mentioned integration of GENESYS and Tallis
As well as demonstrating the use of argumentation tools in business services, the demonstrator will also use best practice in software engineering for enterprise applications. The University of Surrey is leading the work package that is developing the TalliSyS platform, and has considerable industrial and research experience in the use of Model Driven Architecture and Executable UML for developing complex applications. They are also leaders in the use of test automation for ensuring high quality in distributed applications. Both Navus (through the GeneSyS project) and UniS (through the FP6 Digital Business Ecosystems project) have significant expertise in the use of internet services for distributed and agent-based applications. All this experience is being brought into focus on the development of the ASPIC demonstrator.

**User Involvement, Promotion and Awareness**

Collaboration with other IST projects is an important element of ASPIC's work, and this will primarily occur in the second half of the project when ASPIC has theoretical and practical results to disseminate. The projects whose focus most overlaps with that of ASPIC are those in the semantic technologies and agent technologies domains, and ASPIC shares partners with AgentLink III, KnowledgeWeb, Esperonto, OntoGrid and @LIS. Discussions are underway for collaborative activities in the next two years with some of these projects. For instance, ASPIC plans to submit a proposal to run a Technical Forum Group on Agent Argumentation Interface Standards at the Second AgentLink III Technical Forum (TF2), to be held in Ljubljana, Slovenia, in February-March 2005. In addition, the various public dissemination media of these projects will provide useful channels to publicise ASPIC's results, when these become available. An article on ASPIC's work is planned, for example, for the magazine of AgentLink III, AgentLink News, which has 3 issues per year with a print-run of more than 1500 copies per issue. In the other direction, ASPIC's software frameworks may also provide test-beds for the software technologies developed by other projects. ASPIC's has also established an Argumentation Network for dissemination of work to other projects and involvement of the wider research community in tasks of common interest e.g. creating a standard Argument interchange framework.

The ASPIC web site - http://www.argumentation.org - aims to promote the argumentation system services and attract potential users as well as increase project awareness among current user groups. The web site targets the scientific community, industrial partners, public
Future Work and Exploitation Prospects

As we approach the end of the first year of the project, ASPIC partners have accomplished a major percentage of the planned theoretical work on argumentation and are currently initiating analysis, design and development of the ASPIC software platform which will accommodate argumentation services based on theoretical results. A number of small-scale demonstrator scenarios are being prototyped in order to provide the basis for pinning down argumentation systems capabilities that will be required from the ASPIC platform. The core activities of the project for the next year will concentrate on a ‘from theory – to – practice’ pipeline that will enable the consortium to specify and produce a reusable software platform and components, based on a sound agent system that accommodate Argumentation services. Prototypes of the platform and the components are scheduled towards the end of next year with draft internal versions available for evaluation and tests during the year. In the meantime, large demonstrator applications of the ASPIC technology are being defined and will enter the first phase of design early next year.

Further Information

Web site: www.argumentation.org

Deliverables list:

- D1.1 - Review on Argumentation Technology: State of the Art, technical and user requirements
- D1.2 - Applications database
- D2.1 - Theoretical frameworks for argumentation
- D3.1 - Methods for prototyping and testing of ASPIC technology
- D6.2 - Project web site
D.7.1 - Quality Assurance Plan

D7.2 - Project Fact Sheet

Publications and Presentations:


F.J. Bex, H. Prakken, C. Reed & D. Walton: Towards a formal account of reasoning about evidence: argument schemes and generalisations Accepted for publication in Journal of Artificial Intelligence and Law

M. Caminada: Dialogues and HY-arguments. Accepted for publication in the Tenth International Workshop on Nonmonotonic Reasoning (NMR-04), Subworkshop on Argument, Dialogue and Decision, Whistler, Canada, 6-8 June 2004.

C. Cayrol, M. C. Lagasquie. Graduality in argumentation. Accepted for publication in Journal of Artificial Intelligence and Research.


J. Fox and S. Modgil. From Arguments to Agents: Extending the Toulmin View. Submitted for publication to the journal of *Argumentation*.


P. McBurney. Participation in ECAI Workshop on Computational Models of Natural Argument (ECAI 2004), Valencia, Spain, 23-24.08.04. Member of Program Committee and paper presentations.
