fipa inform!

The Newsletter of the Foundation for Intelligent Physical Agents

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Report of Lausanne Meeting

The 24th FIPA meeting was held in Lausanne, Switzerland February 11th-15th hosted by EPFL.

This was a very well attended meeting and there was an active atmosphere in the community. Apart from the work of the TCs we also set the future strategy of work within FIPA.

This is a three-part strategy:

1. to promote a core of existing specifications to standard status as rapidly as possible
2. to develop specifications that encourage semantic integration of heterogeneous agents
3. to deploy FIPA's core by embracing and extending major industry activities such as Web services and ad-hoc networking.

This resulted in a number of TCs phasing out of their work and some new TCs being planned, in particular TC X2S (eXperimental to Standard) and TCs Services and Ad Hoc. TCs Architecture, Compliance, and Gateways suspend their activities for the time being.

The work carried out by current TCs was, in summary:

TC Architecture had a number of presentations on Abstract Content Representation and on service models. The work on ACR has been suspended but the work on service models was adopted and TC Architecture plans to submit a modified AA specification for experimental status.
TC Compliance identified that the two streams of profiles and conformance were longer-term activities that should be resumed after X2S has completed its work (it was not possible to develop specifications in time to materially affect the work of X2S)
TC Gateways promoted the Message Buffering Service, Message Interoperability Service and Device Ontology specifications to experimental status. TC Gateways is dissolved as it has achieved its major objectives.
TC Ontology continued its work on ontology services for agents.
TC Semantics had presentations on semantic frameworks from Andrew Jones and Marco Colombetti. Some experiments were made in using the Jones framework to character some simple performatives, such as inform.
TC X2S had its initial meeting. This TC plans to collect comments on specifications that are or will be in experimental status by the end of April 2002.
Security WG continued its work on security frameworks for FIPA specifications. The security WG will, in future, focus on contributing to the

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News in Brief

The Lausanne meeting was attended by 62 people from 41 institutions and 14 different countries The social event was held at the beautiful Beau Rivage Hotel where Whitestein Technologies sponsored dinner for 55 people.

The next FIPA meetings take place May 6-10, 2002 in Vancouver, Canada; July 22-26 in Helsinki Finland and October 14-19, 2002 in Pensacola, Florida. More details can be found at **http://www.fipa.org/activities/meetings.html**

The FIPA Image committee is working on various improvements to the FIPA website. New sections on Liaisons and a page for Press Releases have already been added. Future improvements will include a Job Section and extended links to industry relevant journals, papers and reports. Keep checking **http://www.fipa.org** for further developments.

J. Kelly

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Lausanne Workshop

The workshop held at the 24th FIPA meeting in Lausanne has animated a number of very relevant talks to the evolution of FIPA, that have been grouped into two main sessions. The first part of the workshop focused on the deployment of agent technology for industrial and commercial applications. The second session focused on privacy and legal issues emerging when making use of multi-agent systems. Finally, all the speakers have been invited to take part of a discussion panel that aimed at clarifying what is the potential of FIPA technology for the future of agent-based applications in the industrial world.

Christian Danneger from Living Systems opened the workshop with his talk about **"Living Markets: industrial and commercial applications of agents".** The main focus of Living Systems is in adaptive execution in complex and dynamic business networks. This is reflected not only in their agent-based products, but also in the markets they are targeting. In their view, the main impact of an agent-based approach can be seen in demand/supply matching and optimisation, capacity procurement yield optimiser and available to promise (ATP) bundling of services.

living systems®
transforming markets

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Stefan Brantschen from Whitestein Technologies discussed the use of **"Agents in a J2EE world"**. In Whitestein's perspective, for an effective deployment of agent technology in an industrial world a crucial aspect is the capability of answering to the current main IT challenges. In particular, J2EE EJB application servers will play a strategic role for guaranteeing the acceptance of agents in the industry. Application servers can become indeed the basis to build reliable and scalable agent-based business applications that are interoperable with current non-agent based systems and technologies.

Susan Thomas from SAP Germany discussed about the **"SAP's interest in software agents".** The talk first presented SAP and its main business activities and then focused on introducing a new research program that investigate the potential of Artificial Intelligence based techniques and software agents applied to business problems. From SAP's perspective, software agents can be used for managing adaptive supply chain networks as well as for improving usability and intelligence of user interfaces.

Steve Kenny represented the Dutch Data *Protection Authority in the PISA consortium* and discussed the topic of **"Privacy and Agents".** Within this context, the main focus is on how to deal with data protection in a complex development environment. Within the EU PISA Project, a current activity is on identifying what can be achieved in terms of encapsulating privacy in multi-agent systems by deploying the FIPA ACL messages structure.

Giovanni Sartor from the Faculty of Law of the University of Bologna focused on legal aspects emerging when making use of agent-based applications in a commercial world. When delegating tasks and responsibilities to software entities for buying, selling, negotiating good or services, one of the main open questions is how to identify who is responsible for what. This kind of issues is currently investigated in the framework of the European Alfabiite project.

Finally, the speakers and the very reactive audience have contributed to animate an extremely interesting discussion panel. Starting from the major issues emerged during the five presentations with regard to the future of agents for industrial frameworks, one of the main significant outcomes of this forum is that for a successful use of agent technology it is necessary to provide solutions that can be flexibly integrated in existing IT systems and are able to address increasing requirements in terms flexibility, automation and personalization of services. FIPA has a major role to play here in promoting interoperability for a dynamic integration of such agent-based services.

M. Calisti and S. Willmott

F4BA (FIPA for Business Applications) SIG

The FIPA Board of Directors established F4BA (FIPA for Business Applications) on October 2001, at the Pleasanton meeting. The main purpose of F4BA is to promote FIPA technology for business applications. The motivation for F4BA is as follows:

1. To ensure commercial applicability of FIPA's results;
2. To enable the promotion of FIPA's results to commercial entities;
3. To attract increased commercial participation in FIPA.

F4BA has three main focuses: the first focus is to identify application areas that derive specific benefits from agent technology and FIPA. The second focus is to identify the core benefits that FIPA offers with respect to the industry practice in these areas. And the third focus is to identify the main challenges to specify and implement FIPA specifications in selected application areas. In addition to these, F4BA should also initiate development and alignment of FIPA towards selected application areas.

As a first stage, F4BA is surveying FIPA members about application areas that they see as important for FIPA. F4BA carried out its first part of the survey by email just before the Lausanne meeting and continued it during the meeting. The second part of the survey will be done as a questionnaire running on the home page of FIPA. In addition, F4BA will arrange discussions with commercial practitioners of application areas (marketing departments) in order to determine how FIPA can improve the current state of art.

The results of F4BA work will be utilised in several ways. For example, F4BA will produce feedback to the Board of Directors as input for determining and evaluating FIPA's vision and strategy. F4BA works in cooperation with FIPA's Image Committee by recommending application areas and benefits for promotion of FIPA and its benefits to relevant audience. In addition, F4BA will provide WGs and TCs with relevant feedback about industrial requirements.

F4BA held its first meeting at Lausanne February 2002. The meeting was a good start for F4BA. The preliminary results of the survey was discussed and based on the discussions, e-learning was selected as an example application to study further and to highlight the benefits of FIPA specifications applied to commercial services. A work-plan will be drafted and distributed via email (F4BA@fipa.org) before the 25th FIPA meeting. In addition, F4BA has decided to write a white paper to describe FIPA technology and to highlight benefits of using FIPA technology in business applications.

The next meeting will be arranged in Vancouver, May 2002. See you there.

H. Laamanen

Ontologies

The ad hoc structure of web pages to provide access to services, the maintenance of these services and user access (via high-level search engines, portals etc.) have provided the drive for a new initiative for developing Web-based services – the Semantic Web. "*The Semantic Web will bring structure to the meaningful content of Web pages*". To achieve this goal a Web-based concept of ontologies is used.

The concept and some degree of standardisation of ontologies are used in many areas of software design, development and deployment. It is clear that the this modellisation is a heterogeneous approach being applied to for example:

- Databases in the form of schemas to create collection of knowledge. Capability for certain useful transformations is generally provided; selection, projection, and joining, for example are common. These can be used for access to, and to a limited degree, for inference on the database.
- Internet through RDF schema which is currently a descriptive approach. How concepts are shared and matched is left to the application developer. Although the future vision of Web-based services fits in well with the concept of context aware systems there are currently some deficiencies, which need to be addressed. The deficiencies in the current Web model can be seen in considering two common requirements in agent systems that maintain both scalability and dynamism: that of openness and autonomy.
- AI using knowledge representation languages and DAI such as OKBC
- Intelligent agent technologies such as FIPA standard for multi-agent systems
- Natural languages systems

The purpose of the ontology work is to remove human intervention were possible of the task of *adding knowledge context* and to allow easier integration when intervention is necessary that is the "a prior knowledge" is reduced. Efforts in ontology design are principally dedicated to share and re-use ontologies. Current ontological developments and standards, aim to address some classic basic requirements:

- Knowledge re-use by multiple systems: Design a particular domain once and re-use many times;
- Knowledge exchange and understanding between systems: Design communication of content between entities (often these entities are loosely classed as agents) to enable co-ordination on solving a particular problem, answering common queries etc. and
- Knowledge maintenance without changes to the core reasoning system: Enable basic changes to a domain without having to change fundamental aspects of the agent itself.

A concept of ontologies and modelling, in an Agent environment, are used at one level to ease automation of:

- Service and domain re-use as an engineered component;
- Service and domain knowledge sharing;
- Service and domain aggregation and specialization.

For an agent environment a concept of service and domain can be applied to many levels of abstraction, e.g. a service can be seen as part of an Agent's infrastructure, a broker, or an application itself. The concept of domain can also make the same mapping.

Multi-Agent systems are required to go beyond the current web model of ontologies in order to support key concepts of openness and autonomy. Part of the Multi-agent systems vision within FIPA is to support a higher degree of automation of the service through utilizing the service model and service processing model rather than a whole *a priori* knowledge engineering process that is presupposed by many systems. Within a multi-agent systems environment the definition of the service model and its constraints is part of the ontology model. However, it is also clear that although there will be a clear core set of representation languages and structures for utilizing an ontology there will not be one and that dealing with diversity of potential models will be key to high-level semantic interoperability even if the agent or service can not work directly with a particular model. Hence some specific key challenges for FIPA can be summarized as:

- Upper ontologies which specifically cover service policies to enable the aggregation and ease interoperability of such services between agents;
- Service ontological modelling requirements and agent use;
- Imposed requirements of an ontology representation language by domains specific needs;
- Ontology requirements on agent conversations and communication languages.

The current FIPA ontology TC proposes as part of its work plan to research and develop solutions to these areas to enable high-level semantic interoperability from a knowledge service perspective. The activities have been to produce a white paper which evaluates some of the initial approaches to ontological modelling and develop the necessary links with the many other standards and working groups who are developing ontological models of services.

P. Charlton

Special Announcements

FIPA was interviewed by Forrester Research, Inc. in Massachusetts for contributions to two papers that they recently published. One is a TechStrategy Brief entitled *Adaptive Agents Boost Supply Network Flexibility* and the other a Tech Strategy Report entitled *Adapting to Supply Network Change*. While the Brief takes an interesting analysis of existing applications and illustrates the contribution agents can bring to the field of Supply Networks, in the TechStrategy Report, Forrester mentions that "While OMG and W3C are working on agent interoperability standards, FIPA's interagent communication standards have been gaining the most traction amongst vendors and the user community."
FIPA Members may access both reports directly through the FIPA website at: http://www.fipa.org/resources/press_releases.html
For non-FIPA Members, the Brief and Report are available directly on the Forrester website at http://www.forrester.com (non clients of Forrester will need to fill out a guest registration at http://www.forrester.com/ER/Login/Guest/1,1394,0,00.html?referer prior to being able to access the documents).

FIPA is a **non-profit organization** and this newsletter is published on a voluntary basis. For details on the different classes and costs of FIPA membership please visit **www.fipa.org** - and remember that you can *attend your first three consecutive meetings without joining*. Membership fees pay for the secretariat, legal and accounting, the website, and the physical costs of meetings - the latter are often co-sponsored by the hosting organizations.

Member Profile—UMBC

The University of Maryland Baltimore County (UMBC) has a large group of faculty and research students involved in agent-related research and has been participating in FIPA activities since 1996. UMBC is a medium-sized, selective, public research university located in Baltimore Maryland, which emphasizes graduate programs in the sciences, engineering, public policy, and human services, and is built on a strong undergraduate liberal arts and sciences core.

Current UMBC faculty with an interest in agent technology include R. Scott Cost, Marie desJardins, Tim Finin, Anupam Joshi, Hillol Kargupta, Charles Nicholas, Yun Peng, Tim Oates, and Victoria Yoon. Some recent alumni include Yannis Labrou, Ye Chen and Jim Mayfield. The group is well known for it's early work on agent communication languages, including KQML and KIF, and on exploring the role of ACLs in multiagent systems. The UMBC group maintains several community portals (agentweb, http://agents.umbc.edu/, and ebiquity, http://ebiquity.org/) as well as hosting the agents and mobility mailing lists.

We are currently engaged in several large research projects that are investigating the interaction and integration of MAS and the semantic web, agent-oriented approaches to mobile computing, context aware computing, large-scale agent-based information retrieval systems, and agents for distributed and ubiquitous data mining. Past large-scale projects have focused on manufacturing planning and scheduling and on ecommerce applications. There are many smaller ongoing projects in diverse areas including modeling distributed trust, hybrid experts for drug design, language learning, intelligent planning, robot control, intrusion detection, and machine learning. For more information, see http://agents.umbc.edu/umbc/.

T. Finin

UMBC
AN HONORS UNIVERSITY IN MARYLAND

Member Profile—Sonera

Sonera is a leading Finnish telecommunications company and an international pioneer in the rapidly growing mobile, data and media communications sectors. Sonera's primary interests are in mobile communications, especially in the 2nd (GSM, GPRS), 3rd (UMTS) and 4th generation mobile networks. Currently Sonera operates GSM, GPRS, and UMTS networks. Sonera has a strong commitment to the development of new wireless Internet services (i.e. nomadic computing or pervasive computing). The 3rd and 4th generation broadband mobile communications networks will enable services such as video and other multimedia Internet services wherever and whenever needed. Sonera Corporate R&D believes that software agent technology will be an excellent technology to create new adaptive wireless Internet services that provide their users with best possible quality of service at all times. Therefore, Sonera Corporate R&D carries out research, development, and standardisation work in the field of MAS and wireless data communications. Sonera has been a member of FIPA since 1999. From the very beginning Sonera has worked on the development of specifications for nomadic application support and has made significant contributions to the NAS specifications.

Sonera Corporate R&D is currently involved in the following agent-based activities:

- FIPA (especially gateways and compliance TCs).
- CRUMPET EU research project, which aims to implement tourism-related value-added services for nomadic users (across mobile and fixed networks). In particular the use of agent technology will be evaluated (in terms of user-acceptability, performance and best-practice) as a suitable approach for fast creation of robust, scalable, seamlessly accessible nomadic services. The implementation will be based on a FIPA standards-compliant open source agent framework, extended to support nomadic applications, devices, and networks.
- WATAC (Wireless Access To Agentcities) research project, the goals of which are to develop enhancements to FIPA-based software-agent-technology designed to access wirelessly services of Agentcities.

Sonera also works in close cooperation with the University of Helsinki, Department of Computer Science, where Sonera people teach agent related courses and participate agent-related research activities.

H. Laamanen

sonera

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X2S process by commenting on experimental specifications from a security perspective.

Liaison SIG noted the many workshops with a FIPA theme or FIPA background in the upcoming AAMAS conference.

F4BA looked at new domains to apply agent technology; in particular there was a presentation on the use of agent to support education in electronic media. F4BA will draft a white paper highlighting the benefits of agent technology and FIPA in particular for business applications.

Planning and Scheduling SIG had its first meeting. The intention is to gather information on this important application domain.

Image Committee looked at improving FIPA's web site, and also looked at various proposals to organize workshops on the FIPA theme within FIPA and externally.

F. McCabe

If you have a story or article that may be of interest to the agent or FIPA community, please submit it to inform@fipa.org for inclusion in future issues of FIPA Inform!

Edited by the FIPA Image Committee.

Comments and opinions are those of the authors, not necessarily of FIPA or its members.

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