POPEYE is a Specific Targeted Research Project funded under IST Call 5 of the European Union's 6th Framework Program, focusing on supporting dynamic spontaneous collaborative group working environments with autonomous coordination and knowledge management support. The project has a duration of 24 months, with start date May 1st, 2006.

Although useful and increasingly put into regular use, current Collaborative Working Environment (CWE) solutions have several limitations and relevant needs for further research. Most systems address either rather traditional and rigid intra-organizational collaboration scenarios or, at the opposite, completely free and unstructured open communities' interactions. Emerging dynamic, more flexible and ad-hoc collaboration schemes are hardly or not supported at all. Typically, explicit representation of the collaboration context, of workers' and team's goals and the semantics of underlying business process are not addressed, and this makes difficult to ensure the context and process awareness, personalisation and collaboration support required in knowledge-rich interactions.

In this setting, the project considers P2P over wireless ad hoc groups, where fixed infrastructure is not a prerequisite, where virtual communities can emerge spontaneously and share data with the appropriate quality of service (persistence, synchronisation, security,…).

Overall, POPEYE:

- draws out an integrated overlay networking architecture that combines the stability and performance of infrastructure networks (when available) with the flexibility and spontaneous character of mobile ad hoc communications;
- develops a communication platform to provide efficient P2P management and communication primitives;
- develops higher-level context-aware, secure and personalised core services to facilitate application development by allowing the combination of user preferences with ambience information, such as time, location, user activity, and peers' presence.

The POPEYE infrastructure is assessed through representative and challenging selected mobility-enabled peer-to-peer e-collaboration applications and two demonstration events during the project lifetime allow the validation of the POPEYE proof-of-concept prototype in realistic situations.
Introduction

“Jorge is a researcher taking part in an important Workshop on Peer to Peer issues. When he arrives at the symposium, he switches on his laptop and discovers the other event attendants. Jorge arrives at the reception desk and physically authenticates as symposium participant. He receives his proceedings book, a badge, a collaborative tool and a signed certificate. By means of the collaborative tool Jorge is able to enter the symposium working group. Jorge’s peer obtains additional collaborative tools provided by conference organizers and by work group users. These additional tools become available in his tool list.

All “shareable” documents stored in the participants’ end devices are automatically made visible in Jorge’s space. Jorge looks for documents that deal with specific issues he is interested in. In particular, he is interested in documents that were edited by his former colleague Perdita. Jorge starts browsing the documents and, although not all of them are available by direct network connection, the system makes them visible and accessible to him through the distributed network just as if they were in a single virtual space. He decides to create a new shared document in which he will collect some of the participants’ feedbacks from the presentations they attended. He leaves the document open for modifications by other participants. Some participants prefer to prepare their comments “off-line” and to insert them in the document when they are happy with them. Others make their comments visible to all as they are in the process of editing them. Some participants chat together through the chat service offered by the system to discuss the details of the contributions during the editing sessions. When the event ends, the conference work group could continue as an Internet work group, or otherwise users could transfer some information to their Internet private work groups.”

The above example is an extract from the reference scenario that was elaborated and selected in during the project lifetime as baseline scenario for POPEYE architecture design.

Today, events as such a Workshop are very different from what is described above. Even if collaboration and communication are two of the most important key values of participating to an international conference, typically it is not very easy to meet people and it is even rarer to meet interesting people from the point of view of a working collaboration. The POPEYE project aims to make reality this scenario.

Many research, open source and commercial systems have been built to support Collaborative Working Environments (CWEs) i.e., computer and communications based systems designed to facilitate communication, collaboration, and collaborative work by groups, organizations, and societies. The most popular are, on the side of commercial systems, BSCW [2], Microsoft’s Sharepoint Services/Portal [9], Collaborative Workspaces [16], KAVI [7], GROOVE [4], Lotus Sametime Connect [8], and, on the side of open source systems, PhpGroupware [12], more.groupware [11], TikiWiki [14].

Such applications would typically offer all or part of the following features:
Although useful and increasingly put into regular use, current CWE solutions have several limitations and relevant needs for further research are generally acknowledged. Most systems address either rather traditional and rigid intra-organizational collaboration scenarios or, at the opposite, completely free and unstructured open communities’ interactions. Emerging dynamic, more flexible and ad-hoc collaboration schemes are hardly or not supported at all. Typically, explicit representation of the collaboration context, of workers’ and team’s goals and the semantics of underlying business process are not addressed, and this makes it difficult to ensure the context and process awareness, personalisation and collaboration support required in knowledge-rich interactions.

Next generation collaborative systems will offer the mobile user seamless and natural collaboration amongst a diversity of agents within distributed, knowledge-rich and virtualised working environment. However, this ambitious goal faces numerous challenges from the underlying communication infrastructure through to the high level application services. These challenges, depending on the operational need, can be addressed in both technological and scientific terms. The POPEYE project focuses on supporting dynamic spontaneous collaborative group working environments with autonomous coordination and knowledge management support. When most of the currently available tools supporting collaboration exploit rigid client-server architecture and rely on a communication infrastructure like the Internet, POPEYE’s ambition is to get collaborative working free from such constraints.

The POPEYE system is intended to be used as easy as possible from the user’s point of view. When POPEYE users want to collaborate they just have to start the POPEYE Environment on their wireless device and login to the POPEYE network.
The device connects to a P2P overlay network which is built upon a mobile ad-hoc network (MANET).

This happens invisibly to the user. In the next step a user can search for and join existing Workspaces or she/he creates a new Workspace and invites other available users to join him for collaboration. In POPEYE the Workspace is the term used to designate a group of users and the data and applications they share. The users who joined a Workspace form the Group that belongs to the Workspace. Sharing of data between all members of the Group is supported by the Shared Space which is associated to each Workspace. The applications the users employ for collaboration (e.g., file sharing, group calendar, whiteboard,...) can be plugged into the user’s local POPEYE environment at runtime. We call those applications Plug-ins and their instances associated to a Workspace and having a specific configuration are named (Plug-in-) sessions. The POPEYE system is secure and context aware at all times.

In what follows these concepts will be illustrated through a typical scenario of use of POPEYE.
The POPEYE Scenario

March 31st, travelling to reach the workshop venue and preparations

It’s March 31st, 20??, the day before the beginning of the latest MiNEMA Workshop and Jorge and Holger, two PhD students in IT disciplines, are independently travelling to Glasgow to attend the event.

When Jorge arrives at the airport he decides to open up his laptop and set up a wireless network on it (calling it “POPEYE-MiNEMA”) and then he launches his POPEYE client. Having POPEYE turned to such a widely used system during the past few years, Jorge has good hopes to find some other POPEYE user who has come to Glasgow to attend the same workshop.

Actually, Holger too turns his laptop on, and discovering the “POPEYE-MiNEMA” wireless network, he decides to launch his POPEYE client in order to see who’s around. Holger tries to discover available Work spaces, and, finding one named “Jorge’s workspace”, joins it and starts a chat session with Jorge. Holger finds out that actually Jorge is going to attend the workshop tomorrow and, during the chat session, the two PhD students decide to share a taxi to reach the town from the airport, and doing so they are able to save some money.

In the meanwhile, at the workshop location in Glasgow, the final preparations are being carried out for the workshop starting tomorrow.

William, one of the logistic staff personnel, is taking a tour around the conference building rooms, in order to check that everything is in order. He enters one of the conference rooms and, in the moment he tries to turn the light on, William discovers that one of the light bulbs is burned out. With his POPEYE-enabled PDA, William joins the “Organization/Logistics” Workspace, previously created for logistic staff and contacts one of his colleagues at the building’s stockroom informing him a new light bulb is needed. The light bulb is replaced, and William finishes his tour of the building without any further delay.

POPEYE Mobile ad-hoc networks

Mobile ad-hoc networks are spontaneous networks composed by several devices where no infrastructure deployment is needed.

However, without such an infrastructure, devices can connect with each other even if they are farther than one hop distance.

In MANETs when a node is interested in sending information to other. All the intermediate nodes will forward the information like a router would do it.

POPEYE will help MANET users interested in collaborative working providing mechanisms that facilitate the creation of workgroups dynamically, even when the nodes of the network are moving from one place to other.
Isabelle is also travelling to Glasgow, today. She’s going to present SWEE-PEA a new research project that investigates some MANET-related topics arising from POPEYE research. When she arrives in her hotel room, Isabelle reviews her presentation and related material locally on her laptop. She organizes all the stuff so that tomorrow she can easily make it available to the conference participants on a specific “Presentations/Swee-Pea” Workspace.
April 1st, before the conference begins

The day of the workshop has come. Activities are going to start at 9:30AM. Before people start coming, Sandra sets up the POPEYE environment for the workshop. She turns her PC on, logs into the POPEYE system and starts creating all the necessary general purpose workspaces for organizational and logistics issues. She starts creating Workspaces like

- Organization/Welcome
- Organization/Services/Taxi Sharing
- Organization/Services/Social Events
- Presentations/General
- etc

She also starts populating the shared spaces for each of the general purpose workspaces with relevant documents. For example, Sandra puts an agenda of the event and a map of the workshop building on the Organization/Welcome workspaces. Instructions, references or useful telephone numbers are shared in some of the Service sharing-related workspaces (for instance, she puts in the Services/Taxi sharing workspace a text document containing the taxi company telephone number, together with reference to alternative transport means such as shuttle bus to the airport, regular buses timetable to reach the town centre, and so on.).

Another specific workspace Sandra creates is for “Presentations/Best talk prize” group. This will be used for discussions and voting to award the best presentation of the workshop.

The workshop attendants start arriving and when Isabelle, Jorge and Holger get to the workshop building they can start to browse through general documentation with their POPEYE enabled laptops. Also Giorgia, another PhD student, arrives to attend the workshop. She doesn’t know POPEYE yet.

Fortunately the fact that the ongoing event is powered by POPEYE is well advertised in the workshop leaflets. Giorgia is able to get an installation CD at the conference reception desk together with necessary instructions. She finds out that she has to follow a very simple procedure to install the software and authenticate at the POPEYE captive portal. Then she creates a new POPEYE account. She indicates in her profile that her main research topics are about hierarchical DHTs. This way, other
Communication Services

Since group communication is essential for collaborative environments, it stands as the most important way of communication between POPEYE peers. Therefore, to enforce and ease the use of group communication, different paradigms are available in POPEYE. Publish/subscribe, naming services, and group message delivery as well as one-to-one messaging provide a rich set of functionalities and concise interfaces to be used by application plug-ins.

Browsing through the other available workspaces, Jorge gladly discovers that there is a “Social/Spanish speaking” group active on the MANET. This can come in handy to find something interesting to do in the evening after the workshop is over.

Marcel, another workshop attendant who is doing a PhD research on Peer-to-Peer network related issues, also discovers a “Special/P2P Issues” workspace and decides to join this for some discussions later during the time he’s not busy attending some presentation. He needs to search some expert in hierarchical DHTs to get some useful advice for his research, and thinks this could be a good opportunity to find them. Actually, later during the workshop, he will find out about Giorgia and decide to invite her to the “Special/P2P Issues” workspace in order to have some discussion on the subject.

William also logs in and joins the “Organization/Logistics/Emergencies” workspace so as to be able to quickly tackle any organizational and logistics emergencies, should these arise during the workshop.

Context Awareness

Context awareness allows services and applications to adapt to changing conditions in the environment. POPEYE is a highly dynamic framework, due to user mobility and spontaneous set up of the software in almost any conditions, as no communication infrastructure is needed.

User context information is delivered to services and applications by following a vertical approach. Thus, it is delivered at all the levels of the software architecture where it is necessary to provide adaptiveness. It is the responsibility of services and applications to use context appropriately to be adaptive.

Context model of POPEYE is based on the definition of a domain ontology which considers users, devices, applications and the environment. Processing of the ontology makes use of Semantic Web technologies.
April 1st, during the MiNEMA workshop

**Multi-hop Communications**

Multi-hop communications rely on the underlying MANET specific routing protocols which are responsible of delivering the messages sent by a source node to a destination one.

These protocols running on the MANET’s nodes will provide them the ability to forward the information to a destination and also to react to links failures, communicating these errors to the source nodes allowing them to launch a mechanism to find the destination again and therefore to send the correspondent information.

The conference starts, and speakers begin to do their presentations.

At mid morning it’s Isabelle’s turn to present her own. The topic of the Swee-Pea project seems to be one of great interest, since a lot of people starts coming to the room reserved to Isabelle’s presentation. Isabelle connects the beamer to her laptop and starts the presentation.

Unfortunately, just after the first few slides, a strange noise is heard and a puff of smoke comes out of the beamer. The beamer’s light bulb has burned out. Isabelle, though, doesn’t panic. She knows that the problem can be quickly reported to the “Organization/Logistics/Emergencies” workspace. Through this, she’s able to contact William and, using a secured session to chat with him, she notifies the problem. Though Isabelle and William are in different rooms, Isabelle’s messages can reach William bouncing through the POPEYE network of connected machines. William answers her to wait just a few minutes to allow him to check the stock. The problem is that after a while, William answers that he’s afraid that no spare beamer light is available to replace the broken one.

During these few minutes of waiting for William’s answer, instead of getting bored, Jorge and Holger can exploit the time to play some of the group games made available from the POPEYE client. They join the “Special/Leisure” workspace and launch a session of the exciting POPEYE Anagram game.

Even with her bad luck, Isabelle knows that she can go on with her presentation: One of POPEYE Plug-ins seems to be exactly what she needs. This is the POPEYE

**POPEYE Extensible Architecture**

The POPEYE architecture has been defined extensible to easily add new functionalities and features. The extensibility refers to a Plug-in infrastructure in which the Plug-ins are the application built on top of POPEYE.

New instances of the same Plug-in (such as the Chat Plug-in) can be started at run-time.

New Plug-ins (that provide new functionalities) can be loaded and started from a local repository or from peers (that shared them) belonging to the same workspace.
Shared Presentation Plug-in allows to illustrate a set of slides on the screens of all the laptops joining the Plug-in session, synchronizing the slide advancements.

Sandra is among the people taking part to the presentation. She is very impressed by Swee-Pea research. She takes some notes and then shares and discusses them with the other members of the “Presentations/Best talk prize”.

Giorgia and Marcel are not attending Isabelle’s presentation. They are still discussing on the “Special/P2P Issues” workspace. Giorgia has shared some documents in the shared space associated to the workspace. Suddenly, her laptop runs out of battery. She then has to return briefly to her hotel room (which is not very far from the Workshop venue), to get her battery charger. This is no problem for the other workspace participants, since even in this event the documents remain available to the workshop members who had access to them.

At the end of Isabelle’s presentation, a discussion takes place on the related workspace. Questions are made by the audience and Isabelle satisfactory answers them all. She then indicates some of the documents she put on the shared space for more detailed information. The interested attendants download these locally on their laptop, in order to be able to consult them when the workshop is over and they’ll be back home.
April 1st, closing

The workshop has come to its end, and everybody is happy with the results. Before leaving, some of the participants take some further time to do some workspace chat about the issues they’re more interested into.

William makes the latest arrangements together with his logistics staff colleagues for the building clean-up after the workshop termination, and he arranges for the printout of attendance certificates to distribute to the workshop participants.

Sandra and the other members of the organization staff taking part to the “Presentations/Best talk prize” have some final discussions using a secured session to chat with each other and share opinions on the presentations they have attended. In the end, Sandra launches the POPEYE Voting Plug-in and a voting session takes place. The great majority of the voters agree that Swee-Pea presentation should be awarded as the best one of the workshop.

Everybody prepares to go back home. Since the workshop has terminated in late afternoon, not every one of the participants was able to take a flight back home in the evening. Those who could, take advantage of the “Organization/Taxi sharing” group to find people to share taxis to go to the airport. The people remaining in Glasgow and leaving the day after, find out through the “Organization/Services/Social Events” workspace that a social dinner has been organized for the evening. Most of them decide to join the dinner and send their adhesion through the workspace. Jorge, too, has to stay in Glasgow for the night. Instead of participating in the social dinner, though, he prefers to join the new friends he got to know through the “Social/Spanish speaking” workspace he discovered at the beginning of the workshop. They agreed to meet separately in order to be able to relax a little and talk in their native language during dinner. They are going to meet at a nice restaurant in the centre of the town. Jorge doesn’t know how to get to the restaurant, but with the help of POPEYE map plug-in someone is able to show him the exact location.

Secure Communications

The POPEYE security benefits both from the stability and the performance of infrastructure as the Internet when available (Certification Authorities) and from the flexibility and spontaneous character of mobile ad hoc networks (light and flexible security mechanisms).

Participants of the network can be classified by their associated trust level, which is computed from their past behaviour and their reputation amongst other participants.

Once POPEYE users have been acknowledged as trustworthy, secure communications and groups can be established. Secrets are shared in order to authenticate or crypt messages and thus protect the user's privacy.
A screenshot of the POPEYE tool
**Conclusions**

This paper presents POPEYE, a Specific Targeted Research Project (STREP) European project that focuses on supporting peer to peer collaborative working environments over mobile ad-hoc networks.

POPEYE aims to give a solution on how to provide support for ad-hoc cooperation, with the appropriate quality of service, in situations where the fixed network infrastructure is absent or cannot be used. The two-years POPEYE Project is now reaching its end. We already have an appealing prototype that give us very positive feedback both from the point of view of the underlying research work and the future implementation.
References

POPEYE Consortium

Including seven organisations from France, Germany, Italy and Spain, the POPEYE consortium is a blend of large industrial enterprises, SMEs, Universities and non-profit Research Laboratories. The following sections describe briefly each of the POPEYE partners.

1.1 Thales Communications

Thales Communications (THC) is one major branch of Thales Group. Thales Group revenues totalled 11.1 billion Euros in 2002, half from the Civilian businesses and half in the Professional and Defence domains. Thales Communication revenues reached 1.5 Billion Euro with 9000 people in 14 countries. THC addresses every activity related to telecommunications: radiocommunications, IP networks, satellite communication, network administration and security. THC has a long experience in very large Information Systems and secure infrastructures for systems and networks, including Internet and Intranets.

THALES

THC develops a full range of telecommunication platforms and components, a range of high performance security products and has a deep skill in secure telecommunications for public and governmental organisations, emergency services and armies. THC Advanced Information Technologies (TAI) department is the French laboratory of the Internet Technology Centre of Thales Corporate Research & Technologies. This Centre is in charge of technological innovation for Thales telecommunications equipment and information systems. This team is involved in leading edge IT projects aiming in specification, design and integration of security and telecommunication infrastructures. THC is involved in many projects at French level, as well as at EC level, was the Project Manager of the successful MOBIVAS IST project and is involved in the ANWIRE IST Thematic Network. THC is also actively contributing to the Software Radio as initiator of the OMG Software Radio DSIG, which has initiate, the “PIM & PSM for Software Radio Component” RFP

http://www.thalesgroup.com

1.2 Universidad de Murcia

The University of Murcia is a large size University with approximately 36,000 students and 3,500 staff members. For the Faculty of Informatics, the ANTS research group take part to POPEYE. The ANTS group is a subdivision of the Intelligent Systems Group, from the Department of Computer Science, Artificial Intelligence and Electronics, University of Murcia, Spain. More information can be obtained from the ANTS web site at: http://ants.dif.um.es/.

Although, in principle, the ANTS group has different activities, that go from artificial techniques like Fuzzy Clustering to rather dissimilar topics as Internet protocols like IPv6/IPsec, there is a thin but coherent line that integrates those activities. This line is the use of the Network Infrastructure to put in collaboration intelligent entities like people, research or software agents, and using this collaboration in order to solve problems. In a similar way as the ants in an ants’ nest seems to have a chaotic behaviour, but that it is only apparently, as there is an order in all their activities. In our case, all our works are integrated and will meet in the “Ether” of the Internet.

UMU has a deep knowledge in security services. In fact, they created a full PKI solution some years ago including SmartCards, and a variety of security services. This solution is currently used not only by UMU itself but by many Spanish universities and entities. Recently this PKI was ported to be fully IPv6 compliant, becoming the first PKLv6 solution available today. Using this basic infrastructure, UMU has evaluated and tested the different VPN/IPsec implementations, developing several systems that allow automatic VPN establishment for IPv6. Related with this support a Policy Management System that let define Policy and Deploy components for secure communications with support for different platforms like 6WIND, CISCO and several O.S. has been designed and implemented. Finally within the expertise of IPv6, the ANTS group has proposed some extensions to IP multicasting (precisely IGMPv3/MLDv2) in order to support access control to multicast environments as well as solutions for the avoidance of DoS attacks in such networks. In addition, a new protocol called MMARP for efficient multicast routing in ad hoc network extensions has been proposed.

http://www.um.es/english
1.3 Universita’ Dell’Aquila

The Software Engineering and Architecture group at the Department of Computer Science at Universita’ degli Studi Dell’Aquila is an active partner of this project sharing its considerable experience in the field of architectural design from the specification to the verification of complex large scale systems. Regarding the architectural design our research concentrates on software architecture description techniques, and their use to improve and to facilitate the verification and validation phases of a system. Following the evolution in software development we have applied software architecture approaches to the correct assembly of component based systems and to their correct deployment and adaptation on heterogeneous (mobile) devices. We have also strongly addressed the problem of using the architectural description to analyze quantitative aspects of software architectures, such as performance for both static and mobile system, reliability and more recently performability, with specific focus on mobile code systems. As far as the formal specification and verification of complex systems is concerned, several models have been proposed which permit to express extra-functional features such as performance, locality and distribution and time. We have also investigated how to migrate these validation techniques in the software mobile domain. How to retrieve relevant information to be used during the system validation from an SA description is another area investigated in our research: testing and model-checking techniques have been proposed to validate architectural specifications to requirement-level decisions and implementation choices. The application of functional analysis techniques to open architectures (in particular, to families of software architectures) is currently under analysis with the objective to scale analysis’ results obtained over one specific architecture to an entire family of architectures. We have also proposed a distributed intrusion detection approach for secure software architecture, to monitor the correct peers behaviour in peer-to-peer systems.

http://www.di.univaq.it

1.4 Universidad Rovira i Virgili

The University Rovira i Virgili is a mid-sized University with approximately 12,000 students and 950 lecturers. The URV has eleven faculties and schools, which teach fifty different courses in the areas of health sciences, social sciences, humanities, technology and experimental sciences. At the Department of Computer Engineering and Mathematics, the research group of Architecture and Telematic Services will participate in this project. Our research group merges a multidisciplinary team which tackles key investigation lines of telematic services. We focus on investigating and developing new distributed services and middleware to support collaborative work on different scenarios. We have developed expertise in distributed systems and middleware in the last years exploring different software architectures, framework component systems as well as distributed services like publish / subscribe, group-based communication, application level multicast and persistent storage systems. Furthermore we have constructed distributed infrastructures for supporting multi-user tridimensional Collaborative Virtual environments (multi-user virtual reality), and more recently Mixed Reality and Augmented reality Collaborative Platforms. Over the last few years, the group has been focusing on peer-to-peer settings, and three PhD students are working in this topic. As a consequence, we have designed and prototyped an edge computing infrastructure on top of a structured overlay network that permits secure deployment of J2EE applications over P2P networks (SNAP project at ObjectWeb). This platform includes innovative middleware services like a decentralised name service, new invocation abstractions like anycall or manycalls, object and component persistence mechanisms over replicates stores, and resource location services on top of dynamic overlay networks. Finally, we are also working actively to develop new p2p overlay algorithms that tackle problems like heterogeneity and super peers in hierarchical structured systems and enhanced robustness under security attacks (Cyclone protocol). We are now currently working on designing less structured overlays being more robust to churn and security attacks and providing efficient mechanisms for data location and retrieval.

http://www.urv.es
1.5 GET – ENST

ENST is one of France's leading graduate engineering schools and is considered the school in the field of Information Technologies. At the Computer science and networks Department we have developed strong expertise in middleware technologies; we have been involved in designing and building several middleware systems. We have explored several communication models including client-server, broadcast, publish-subscribe, distributed shared memory, in wired and wireless settings. We started work on peer-to-peer during spring 2004. We have also been working for several years on the reconfiguration capabilities of various middleware in the context of mobile systems. In previous work, we have investigated middleware solutions for service provision in wireless/mobile/adhoc networks (IST-MOBIVAS project; ITEA-AMBIENCE project). We have designed and prototyped a service provision platform that supports terminal classification, service discovery, service downloading and operation, taking into account terminal class and user preference (a form of static adaptation). We are currently working on possible ways to go further towards the support of services that can dynamically adapt to resource and parameter variations. We are also investigating middleware solutions for the support of applications in MANETS.

http://www.enst.fr/

1.6 OFFIS e.V.

OFFIS, which is founded in 1991, is an application-oriented non-profit research and development institute related to the Computer Science department of the University of Oldenburg in Lower Saxony, north-western Germany. Its primary mission is to:

- Adopt the findings from university basic research in computer science and other relevant disciplines
- Stay in touch with new market demands through its many years of experience in co-operation projects with the industry
- Bridge the gap between "basic research" and "application demands" through application-oriented research

The content-related work at OFFIS is performed in projects within fixed time scales. The institute has a wide spectrum of projects covered. Among them are projects, which are financed through state funding from the Ministry for Science and Culture, publicly supported (e.g. by the EU or Federal Science Ministry), and partly internationally oriented third-party-funded projects or even specific development and consultancy projects. By 2002, third party funding ratio reached the amount of 74%, of the total yearly research budget of about 8 million €. With this ratio, OFFIS has a top ranking both among the other institutes in Lower Saxony as well as nationwide.

OFFIS staff counts about 200 employees, from which more than 100 are scientists. The most of them (in their vast majority computer scientists, but also engineers, economists, physicists and from other disciplines as well) work in interdisciplinary teams. The department of Multimedia and Internet Information Services places its focus on research and development in the areas of mobile services and environments, delivery of information on demand and virtual spaces.

http://www.offis.de
1.7 Softeco Sismat SpA

Established in 1979, Softeco Sismat S.p.A. is a leading Company in the Information and Communication Technology market. Tackling the growth of the global market with a firmly established commercial attitude towards collaboration, we operate in Italy, Europe, Middle and Far East either as a supplier of software solutions for qualified, large industrial partners or as a main contractor for the delivery of turnkey complete solutions.

With the headquarter located in Genoa and branch offices in Milan and Parma, Softeco has currently (2003) a staff of about 160 professionals, including system, project and research engineers, software analysts and developers. We carry out major ICT and industrial projects by integrating systems, networks, products and technologies, and complementing our offer with the supply of technical and organisational consulting, as well as specialised services and training.

The company’s marketplace covers several industrial and business sectors, including: mission critical industrial IT solutions in manufacturing and engineering (steel, chemical and mechanical), energy production and distribution networks, environmental monitoring and protection; e-Commerce/e-Business/e-Work solutions for industry, public and private organisations; m-Work solutions in different industrial sectors (e.g. shipping, automotive, etc.) and service markets (e.g. infomobility, transport, tourism and travel, logistics, health care, etc.); multimedia content management applications in different business areas (health care, transport, land and environmental resources, training and distance learning, entertainment and sport, etc.); web applications and e-Services (e-Learning and tutoring, web based exhibitions, video-on-demand, etc.); advanced applications for the planning and management of public transport and mobility services; architectures and solutions for trading and on line asset management.

http://www.softeco.it
POPEYE is a Specific Targeted Research Project (STREP) part-funded by the EU under the 6th Framework Program, IST priority, Contract No. IST-2006-034241