

**SIXTH FRAMEWORK PROGRAMME
PRIORITY 2
Information Society Technologies
Cognitive Systems**



Contract for:

COORDINATION ACTION

Annex 1 - "Description of Work"

Project acronym: euCognition

Project full title: European Network for the Advancement of
Artificial Cognitive Systems

Contract no.: 26408

Date of preparation of Annex 1: 27th September 2005

Start date of contract:

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1. Project Summary

The principal goal of the euCognition network is to advance the emerging area of cognitive systems by fostering truly inter-disciplinary interaction, spanning a greater spectrum of people, perspectives, and applications than is possible in a single R&D project.

The objective is to support the research community that is already involved in FP6 projects in cognitive systems and to help other individuals from research institutes and companies become involved in this initiative. This will be achieved by facilitating interaction between projects and collaboration between individuals on a variety of fronts, ranging from workshops, conferences, courses, exchanges of staff and students, development & dissemination of training material, access to development platforms, research planning, and the creation of an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

The ultimate aim is to leverage added-value from existing work through interaction and to use this to encourage further contributions from new participants. A key objective of the network is to foster interaction between all the many different scientific sectors involved in this multi-disciplinary area and to help create truly inter-disciplinary perspectives.

The network will be organized in two complementary ways: (i) by the different areas comprising cognitive systems, and (ii) by the activities of the network.

The different areas will be grouped so that the large number of issues that are relevant to cognitive systems are covered completely but in a way that allows their inter-relationships to be clear. There are three principal areas:

- (a) The underlying paradigms of cognition;
- (b) The scientific development of cognitive systems, including
 - Scientific foundations;
 - Functional capabilities of proto-typical systems;
 - Application-specific competences, validation scenarios, and future applications.
- (c) Highly-topical and formative issues.

The activities will cover the four key issues of:

- (a) Outreach
- (b) Scientific Outlook
- (c) Education
- (d) On-line Resources for the Community

In addition, there will be two support activities, one concerned with *Network Coordination* and the other with *Management of the Consortium*, including financial administration and reporting.

Inter-project collaboration and the involvement of new blood from all relevant sectors of both academia and industry will be addressed under the *Outreach* heading. The *Scientific Outlook* activity embraces research planning and technology-watch actions. A large amount of effort will be devoted to refining and developing the characterization of cognition that forms the basis of the network at its inception and thereby creating an ambitious but inclusive research agenda.

2. Project objectives

The discipline of cognitive systems is at an embryonic state of development. Consequently, the best way to make progress is to bring as many of the relevant players together as possible, to establish the discipline on a more solid footing, to foster the integration of the contributing sub-disciplines, and facilitate debate through mutual interaction. In short, an element of coordination is required to enable the advancement of the discipline, but not to force it in any one direction or another. This is the *raison d'être* for euCognition.

Consequently, the *euCognition* Coordination Action has four main objectives.

The principal goal of the *euCognition* network is to assist in the advancement of the discipline of cognitive systems. Because of the emerging nature of the area, because it involves so many disparate sub-disciplines, and because there are several alternative approaches, this means the network must foster truly inter-disciplinary interaction, spanning a greater spectrum of people, perspectives, and applications than is possible in a single R&D project. *So, broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate is the first objective of euCognition.* This means we require the active involvement of the scientific community.

The best way to gain the interest of the community is to offer them a valuable service or resource. Thus, *the second objective of euCognition is to support the research community that is already involved in FP6 projects in cognitive systems and to help other individuals from research institutes and companies become involved in this initiative.* This will be achieved by facilitating interaction between projects and collaboration between individuals on a variety of fronts, including

- Workshops
- Conferences
- Courses
- Exchanges of staff and students (especially across disciplines)
- Creation of training material
- Research planning exercises
- Creation of material and resources to support research activities
- Enabling access to (and sharing of) specialized research platforms

These activities are provided for illustration only; a much more comprehensive list is provided in the Sections B.3 and B.6.

A third objective is to enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.

All of these activities will have concrete outputs which will be openly and easily accessible. This will be achieved through *the creation of an extensive dynamic web-based repository resources to facilitate*

research, education, and outreach to the greater community. This is the fourth objective of euCognition.

The euCognition network will produce a substantial body of resources that will support research, education and training, and outreach to the general community. However, the *process of producing this material* is an equally-important outcome of the network because it is by this activity that we will create the multi-disciplinary involvement, the inter-disciplinary discourse, and the cross-paradigm debate that will actually advance the area substantially.

In summary, the four principal objectives of euCognition are:

1. Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
2. Provide support for the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
3. Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
4. Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

We are left now with the task of specifying how these objectives can be achieved. Because of the complexity of the area (due to its multi-disciplinary make-up and its emerging nature), we need an innovative approach, one that encourages interaction and concrete contribution and doesn't allow administrative overhead to inhibit people's involvement. We will deal with these issues in detail in Section 6 (Project Management) and Section 7 (Detailed Implementation Plan).

3. Participant List

Partic. Role	Partic. No.	Participant Name	Participant short name	Country	Date enter project	Date exit project
CO	1	Università degli studi di Genova	UGDIST	Italy	Month 1	Month 36
CR	2	University College Dublin	UCD	Ireland	Month 1	Month 36
CR	3	Technische Universitaet Wien	TUW	Austria	Month 1	Month 36
CR	4	Högskolan i Skövde	HIS	Sweden	Month 1	Month 36
CR	5	Linköpings Universitet	LIU	Sweden	Month 1	Month 36
CR	6	Ruhr-Universitaet Bochum	RUB	Germany	Month 1	Month 36
CR	7	The Appliance Studio Limited	Appliance Studio	United Kingdom	Month 1	Month 36
CR	8	Centre National de la Recherche Scientifique	CNRS	France	Month 1	Month 36
CR	9	Max Planck Institute for Mathematics in the Sciences	MPI MIS	Germany	Month 1	Month 36
CR	10	University Medical Center Hamburg-Eppendorf	UKE	Germany	Month 1	Month 36

*CO = Coordinator

CR = Contractor

4. Relevance to the objectives of IST activity in cognitive systems

Computer systems pervade all aspects of life today. This is well known. However, they are not as ubiquitous as some might think, nor as useful as some might like. If we look at the applications in which software-based systems have been most successful, we see that they are almost without exception those where the space of interaction are tightly constrained and unambiguously specified. Even though the processing that these systems effect can be extremely complex, the input space is typically well-known and well-defined. On the other hand, the stated priority of the IST Programme in cognitive systems is

“to develop artificial systems that can interpret data arising from real-world events and processes (mainly in the form of data-streams from sensors of all types and in particular from visual and/or audio sources); acquire situated knowledge of their environment; act, make or suggest decisions and communicate with people on human terms, thereby supporting them in performing complex tasks.”

This is an ambitious goal because the information or data that characterizes such real-world events and processes is inherently uncertain, incomplete, and time-varying: exactly the circumstances in which existing systems perform poorly. Arguably, it is impossible to build a conventional information processing system that can deal with these circumstances because it places too great a burden on the analysis of the situation and design of the system: it isn't possible to build in or anticipate all the possible eventualities.

To deal with circumstances where the space of inputs is poorly specified, we need to be able to create more robust, resilient, and adaptable computer systems. The hope is that we can do this by endowing them with a cognitive faculty: the ability to learn, adapt, weigh alternative solutions, and even perhaps to develop new strategies for analysis and interpretation. This is the focus of the IST Programme:

“Research into ways of endowing artificial systems with high-level cognitive capabilities, typically perception, understanding, learning, knowledge representation and deliberation, thus advancing enabling technologies for scene interpretation, natural language understanding, automated reasoning and problem solving, robotics and automation, that are relevant for dealing with complex real-world systems. It aims at systems that develop their reasoning, planning and communication faculties through grounding in interactive and collaborative environments, which are part of, or connected to the real world.

These systems are expected to exhibit appropriate degrees of autonomy and also to learn through social interaction among themselves and/or through human-agent cooperation; in a longer term perspective, research will explore models for cognitive traits such as affect, consciousness or theory of mind.”

This then is the base line for the research programme in cognitive systems. However, the discipline of cognitive systems is not a mature one. It is characterized by a very broad base of constituent sub-

disciplines, highly-distinctive alternative approaches, and some disagreement as to what cognition is in the first place. Whilst the characteristics of a successful cognitive system might be relatively easy to state, it is not at all clear how to achieve them.

The FP5 and FP6 programmes in cognitive vision systems and cognitive systems have displayed great foresight in fostering diversity of approaches and in mandating strong inter-disciplinary work. However, there is only so much that any one consortium can do to progress the discipline as a whole. By definition, a consortium has a focused and distinct world view (or scientific foundation) that it is endeavouring to further. It is not in its interests to embrace the diversity that appears across the spectrum of existing or future research programmes. But it is essential that this diversity be encapsulated in some way to engender debate, foster cross-fertilization of ideas, and serve the community at large (both the scientific community and the general public) by making it aware of the achievements or potential of the discipline.

This is exactly the motivation for the euCognition network and the objectives outlined in the previous section, and expanded upon in later sections, are focused on creating this research eco-system which can support the requisite diversity but at the same time work toward the overall advancement of artificial cognitive systems, and the subsequent deployment in challenging applications.

In summary, then, the euCognition network is critically relevant to the IST Priority Area of Cognitive Systems because:

- (a) It provides a mechanism by which to facilitate greater inter-disciplinary interaction than is possible in individual research projects.
- (b) It supports each individual research project by providing scientific outlook, education facilities, and research resources that, otherwise, it would not have.
- (c) It provides a means by which to reach out to communities that are not involved in ongoing projects: the scientific community in all sectors and disciplines, the business community that will eventually benefit from the enhanced capabilities of cognitive applications, and the general public who need to be aware of the great challenges and opportunities that this area offers.

euCognition is therefore both inward looking and outward looking in its perspective, providing support, and helping to amplify the efforts of individual players.

5. Potential Impact

When dealing with potential impact, there are two complementary issues at stake:

1. The type of impact
2. Who is affected

The type of impact is dependent on the specific activities undertaken (*e.g.* in research planning, or in education) while the people affected depends on both the way the activities are undertaken and the way the results are made available (typically, in some easily accessible concrete persistent form). As we will see in Section 7, Detailed Implementation Plan, the four targeted euCognition activities span the complete spectrum of cognitive systems and the outcome of all activities will be made publicly available in an easily accessible form on the euCognition website.

For convenience, the spectrum of cognitive systems is divided into three principal areas:

- 1) The underlying paradigms of cognition;
- 2) The scientific development of cognitive systems, including
 - i) Scientific foundations;
 - ii) Functional capabilities of prototypical systems;
 - iii) Application-specific competences, validation scenarios, and future applications.
- 3) Highly-topical and formative issues.

The four targeted activities are:

- (a) Outreach
- (b) Scientific Outlook
- (c) Education
- (d) On-line Resources for the Community

Consequently, the impact that the network will have will include the bridging of disparate communities through outreach (bridging both within sub-disciplines in scientific community and between the scientific community and the public at large), the identification of a solid, broadly-based and consensus-driven research agenda, and the development and promotion of the discipline in all its many guises through the creation of educational material and through the exchange of staff and students among participating member. In this context, special effort will be exerted to build a wide-ranging community that can participate effectively in FP7.

Ultimately, our goal as a community is to support the advancement of the scientific understanding and engineering knowledge of natural and artificial cognitive systems to allow them to be deployed in challenging applications. The likelihood of this being achieved will be greatly enhanced through the sharing of current knowledge and the creation of new ideas in the forum provided by euCognition.

5.1. Contribution to Standards

All outputs (technically all knowledge produced by the project¹) will be open and free, in the sense defined by the Open Source Initiative (OSI)² and the Free Software Foundation³. Specifically, all software will be made available to the community under a GNU General Public Licence (GPL) and all documents will be made available to the community under a Free Documentation Licence (FDL).

This adherence to the philosophy of open systems for all activities and results will help contribute, if not to formal standards, at least to common usage and mutual sharing of knowledge in the community, thereby fostering more effective collaboration. Because the GPL / FDL licences are copy-left licences, this ensures that all works or results that are derived from the results of the euCognition activities will also be open and free (and available under GPL / FDL licences).

5.2. Contribution to policy developments

One of the four principal activities of euCognition is devoted to scientific outlook. This activity has the explicit objective of identifying those issues that are crucial to the development of the discipline overall. Among other instruments, these will be summarized in a research roadmap that will be developed in the network. We expect this roadmap to contribute directly to the development of policy.

5.3. Risk Assessment and related communication strategy

As set out in Section 6 – Project Management and Exploitation/Dissemination Plans – three oversight bodies will be created: the Executive Committee, with overall responsibility for the operation of the network, the project coordinators round-table forum, with the brief of fostering interaction between the many cognitive systems projects, and the Assessment Panel, comprising a small number of individuals who are not directly involved in the activities of euCognition. The main task of the Assessment Panel is to provide periodic input to the Executive Committee and the Commission on the perceived success in achieving the network's objectives. The will be aided in this task by the fact that up-to-date statistics on the production and usage of the planned network outcomes through the euCognition website (see Section 7 – Detailed Implementation Plan – for further details). Risk will therefore be assessed and managed in two ways, one internally by the Executive Committee and one externally by the Assessment Panel.

¹ “Knowledge: means the results, including information, whether or not they can be protected, arising from the project governed by this contract, as well as copyrights or rights pertaining to such results following applications for, or the issue of patents, designs, plant varieties, supplementary protection certificates or similar forms of protection.” Annex II of the FP6 Contract.

² www.opensource.org

³ www.fsf.org

6. Project management and exploitation/dissemination plans

6.1. Project Management

Introduction

There are several components to the management of a coordination action. These include:

- Management of the financial and administrative issues
- Coordination of the network as a whole to achieve overall cohesion
- Coordination of the individual areas of activity of the network

To achieve effective project management, we require dedicated organizational bodies and explicit operating procedures to run the network.

In euCognition, there are four organizational bodies:

1. The Network Coordinator;
2. The Executive Committee;
3. The Round-Table Forum for Coordinators of Cognitive Systems Projects;
4. The Assessment Panel.

Five operating procedures are required for:

1. Processing Membership Applications;
2. Admission of New Contractors;
3. Reimbursement of Travel Costs;
4. Funding of Network Actions;
5. Resolution of Conflict.

The Network Coordinator will be responsible for management of the financial and administrative issues. Responsibility for coordination of the network as a whole will be shared by the Network Coordinator and the Executive Committee. Responsibility for the coordination of the individual areas of activity will primarily be taken by the Executive Committee, with support from the members of the network and the Round-Table Forum. The Assessment Panel will be responsible for providing external guidance on all aspects of the operation of the network.

The exact responsibilities of each body are detailed below, followed by the specifics of each of the five operating procedures.

Organizational Bodies

Network Coordinator

The network coordinator is responsible for both the administrative project management and the day-to-day network coordination.

The network coordinator also represents the Coordinating Contractor and is thus the administrative contact person with responsibility for liaising with the European Commission. All communication between the project and the Commission is directed through the Coordinator. The Coordinator is responsible for collection and compilation of progress reports, which should be approved by the Executive Committee. The Coordinator will organise, chair, and arrange minuting of Executive Committee meetings and the Network six-monthly meetings.

The coordinator is also responsible for quality control and evaluation of work in the targetted activities. The coordinator is responsible for timely notification of the Executive Committee in the event of lack of progress in any of the funded Network Actions.

Executive Committee

The Executive Committee comprises twelve key individuals who will take initial responsibility for coordinating the component activities of the network, and who will have collective responsibility for

- (a) admitting members to the euCognition network, and
- (b) making decisions on the allocation of funds to the various initiatives proposed by members.

The decision-making process is set out in the operating procedures below.

The members of the Executive Committee are:

David Vernon	Università degli studi di Genova (network coordinator)
Fred Cummins	University College Dublin
Markus Vincze	Technische Universitaet Wien
Tom Ziemke	Högskolan i Skövde
Erik Hollnagel	Linköpings Universitet
Christoph von der Malsburg	Ruhr-Universitaet Bochum
Bill Sharpe	The Appliance Studio Ltd.
Guy Tiberghien	Centre National de la Recherche Scientifique (CNRS)
Juergen Jost	Max Planck Institute for Mathematics in the Sciences
Andreas Engel	University Medical Center Hamburg-Eppendorf
Peter F. Dominey	Centre National de la Recherche Scientifique (CNRS)
Matthias Scheutz	Notre Dame University

The Executive Committtee will be chaired by the Network Coordinator.

Responsibility for the coordination of each area or activity is not statically assigned to specific fixed individuals. Instead, responsibility will be rotated on a six-monthly cycle. Thus, one person will take charge of coordinating and working on a given topic for a six-month period. By allowing responsibility to rotate like this, it is expected that we will get a higher level of participation by members since the extent of their undertaking is limited in time and in any case is relevant to their interests.

However, responsibility for the first six months is assigned to members of the Executive Committee, as follows:

Outreach	Erik Hollnagel
Scientific Outlook	Tom Ziemke
Education	Markus Vincze
Website	David Vernon

Whilst responsibility for area coordination will typically rest with a member of the Executive Committee, there is nothing to preclude an ordinary member of the network from acting in this capacity also.

Round-Table Forum for Coordinators of Cognitive Systems Projects

The Project Coordinators Round-Table Forum will comprise the principal coordinator of each FP6 Cognitive Systems project. It will provide one mechanism for the network to engender greater collaboration amongst the cognitive systems projects.

The Assessment Panel

The Assessment Panel will comprise a small number of individuals who are not directly involved in the activities of euCognition. Their main task will be to provide periodic input to the Executive Committee and the Commission on the perceived success in achieving the network's objectives. Note that, because of their role in the on-going evaluation of the project, the members of the Assessment Panel will be chosen by the Commission, with input from the Executive Committee and Coordinators Round-Table Forum, mediated by the Network Coordinator.

Operating Procedures

Admission of Members

Eligibility for Membership

Any institute, company, or individual that is active in the area of cognitive systems and any of its constituent sub-disciplines may apply for membership of the euCognition network. Membership will be granted following a satisfactory review of the application form by the Executive Committee.

All institutes and companies that are members of a consortium of FP6 Cognitive Systems projects are *automatically* eligible for membership of euCognition, and membership will be granted upon submission of a completed application form. This membership form will be made available on the euCognition website (www.eucognition.org)

All current members of the ECVision network for Cognitive Vision Systems are also *automatically* eligible for membership, and membership will be granted upon submission of a completed application form.

Special Conditions for Admission to Membership of euCognition

Apart from being active in the area of cognitive systems, there is one condition of membership that applies to everyone (even those automatically eligible for membership). Applicants must commit to make at least one specific contribution to the goals of the network, specifically by identifying a task that they will carry out in the context of the action/activity matrix detailed in Section 7 – Detailed Implementation Plan - either under the existing headings or under a new heading that reflects the member's particular interests. This task must be completed within one year of becoming a member. This 'entry fee' will help ensure the active participation of the members.

Decision-making Procedure

The decision to admit the applicant or not will be taken by the Executive Committee after reviewing a completed application form submitted by the applicant. The decision to accept or reject an application will be made by simple majority voting. Since there is an even number of members on the Executive Committee, the Network Coordinator will have a casting vote.

Applications by institutes, companies, or individuals that are automatically eligible for membership do not need to be reviewed by the Executive Committee.

Membership Agreement

Any institute, company, or individual that is admitted to membership of euCognition must sign a membership agreement that sets out their rights and obligations as a member. This membership agreement will form part of the Consortium Agreement.

Admission of New Contractors

Members are not obliged to become a party to the Contract. However, any member wishing to become a contractor may do so at any point in the lifetime of the project. To become a contractor after the contract has come into force, the member completes Form B - REQUEST FOR ACCESSION OF A NEW CONTRACTOR TO THE CONTRACT (this is a part of the model contract) and submits three signed copies to the Coordinator together with two enclosures:

- 1) Contract Preparation Form (CPF) duly completed and signed by the new contractor.
- 2) Modified Annex I to the contract describing the work to be performed by the new contractor: this is simply the specification of the contribution the member committed to making in the original membership application form (see Section *Special Conditions for Membership of euCognition* above).

Any member that becomes a contractor undertakes all the responsibilities of a contractor, including the requirement to produce an audit certificate for all costs incurred. Note that under Special Clause 39 of the Contract, an audit certificate is not required until the end of the contract if the total amount of costs to be claimed is less than €150,000.

Reimbursement of Costs

All members are eligible to claim travel costs associated with official euCognition events, as notified on the euCognition website, subject to guidelines similar to those already established for the ECVision network.⁴ A full set of guidelines for euCognition will be published on the euCognition website (www.eucognition.org).

Members should claim travel costs by completing a 'Request for Reimbursement' form and submitting it to the Network Coordinator, together with original receipts. The Coordinating Contractor will then reimburse the claimant (the institute/company/individual) directly, typically within a few weeks of receipt of the claim, and typically by electronic bank transfer.

Funding of Network Actions

Proposal of Network Actions

Members may apply for limited funding to carry out tasks that contribute to the work of the network, specifically in the context of the action/activity matrix detailed in Section 7 – Detailed Implementation

⁴ www.ecvision.org/information/Travel,_Computing,_&_Other_Costs.htm

Plan. These tasks are referred to as Network Actions. A pro-forma proposal form will be available on the euCognition website (www.eucognition.org).

Review and Award

All proposals will be promptly reviewed by the Executive Committee, and a decision will be made to accept, reject, or recommend technical or financial amendments to the proposal. The decision will be made by simple majority voting. Since there is an even number of members on the Executive Committee, the Network Coordinator will have a casting vote. An amended application can be resubmitted for reconsideration. All accepted proposals will be forwarded to the Commission Project Officer for final approval. The Project Officer can decide to approve, reject, or recommend technical or financial amendments to the proposal. Note that to ensure that the Project Officer is aware of all pending applications and their content, she or he will be included on the Executive Committee email circulation list used to discuss these matters.

Reimbursement of Cost

Costs incurred in carrying out an approved Network action will be reimbursed upon completion of the action and, in particular, upon the agreed output being uploaded to the euCognition website and approved by the Network Coordinator.

Non-labour costs can be claimed directly from the main contractor by submitting a 'Claim for Reimbursement of Costs' (see Section *Reimbursement of Costs*). If the action involves an element of labour cost, the member has two options:

- 1) to become a contractor (see Section *Admission of New Contractors*) in which case the Coordinating Contractor will assign (or amend if the member is already a contractor) the budgetary provisions for the Contractor accordingly to the agreed amount of funding for the Network Action.
- 2) to undertake the effort associated with the Network Action as a subcontract. A template subcontract will be provided in the Consortium Agreement. Please refer to Appendix A.2 *Sub-Contracting* for further particulars of the conditions attaching to sub-contracts.

In both options, the member will have the choice of having non-labour costs reimbursed directly by the coordinating contractor simply by submitting a 'Claim for Reimbursement of Costs' (see Section *Reimbursement of Costs*) or having the non-labour costs included in the total amount associated with the (sub-)contract.

Resolution of Conflict

In case of conflicts between two or more network members on matters concerning the network, the Executive Committee is informed. The Coordinator will then initiate a one-month negotiation phase and arrange that an Executive Committee member be elected as convening negotiator to help resolve the conflict. If negotiations fail and no solution is found within the one month period, the conflict will be resolved by a vote among the Executive Committee. In the situation of a tie the vote of the Coordinator determines the final decision.

6.2. Plan for using and disseminating knowledge

One of the four targeted euCognition activities is dedicated exclusively to outreach and, therefore, to the use and dissemination of knowledge. As set out in Section 7 – *Detailed Implementation Plan* – the Outreach activity includes nine tasks dedicated to using and disseminating knowledge. These are:

Inaugural Meeting (T1.1)

Six-monthly Meetings (T1.2)

Inter-project Workshops (T1.3)

Extra-network Workshops (T1.4)

Special Sessions at Conferences (T1.5)

Short-term Exchange/Visits of Research Staff (T1.7)

Short-term Exchange/Visits of Post-graduate Students (T1.8)

Pilot test-bed Evaluation of Basic Cognitive Functions (T1.9)

Best Demonstration Prizes in Cognitive Systems (T1.10)

Special Issues in Journals (T1.11)

Repository of Application-oriented Demonstration Scenarios to Drive R&D (T1.13)

Please refer to Section 7.6 – *Work Package Descriptions* – for details on these tasks and the expected outcomes.

In addition, the *On-line Resources* activity focuses on providing a dynamic web-based repository of material that will assist the cognitive systems community, in research, in education, and in making the relevance and importance of cognitive systems visible to the greater community. Its organization will reflect the operation of the euCognition network, and will be structured by both Activity and Area. The goal is to make this the community's website of choice where they share information and interact with

one another. It should also act as catalyst for deployment of cognitive systems technologies by making available show-case results and example validation experiments. The on-line resources will be accessed through www.euCognition.org.

One factor in particular will contribute to the use and dissemination of knowledge created in the context of the euCognition network. This is the licensing arrangement for all outputs (technically all knowledge produced by the project⁵). These outputs will be open and free, in the sense defined by the Open Source Initiative (OSI)⁶ and the Free Software Foundation⁷. In general, all software will be made available to the community under a GNU General Public Licence (GPL) and all documents will be made available to the community under a Free Documentation Licence (FDL).

This adherence to the philosophy of open systems for all activities and results will help contribute to common usage and mutual sharing of knowledge in the community, thereby fostering more effective collaboration. Because the GPL / FDL licences are copy-left licences, this ensures that all works or results that are derived from the results of the euCognition activities will also be open and free (and available under GPL / FDL licences).

All outputs will be made available on the euCognition website.

6.3. Raising public participation and awareness

As noted in the previous section, one of the four targeted euCognition activities is dedicated exclusively to outreach to the community at large, embracing both inter-project collaboration and the involvement of new blood from both academia and industry, but also encompassing efforts to reach the general public. As set out in Section 7 – *Detailed Implementation Plan* – the Outreach activity includes four tasks dedicated to raising public participation and awareness. These are:

Awareness Forums at Trade Fairs & Science Fairs (T1.6)

Repository of Demonstrations of Example Systems (T1.11)

Articles for General Readership (T1.15)

⁵ “Knowledge: means the results, including information, whether or not they can be protected, arising from the project governed by this contract, as well as copyrights or rights pertaining to such results following applications for, or the issue of patents, designs, plant varieties, supplementary protection certificates or similar forms of protection.” Annex II of the FP6 Contract.

⁶ www.opensource.org

⁷ www.fsf.org

Multimedia Production for General Viewing (T1.16)

Please refer to Section 7.6 – *Work Package Descriptions* – for details on these tasks and the expected outcomes.

7. Detailed Implementation Plan – for whole duration of the project

7.1. Introduction – general description and milestones

To understand the euCognition implementation plan, we must first specify how the network's activities will be organized. Because of the complexity and multi-faceted nature of the Cognitive Systems discipline, the network will be organized in two complementary ways:

1. by the different areas comprising cognitive systems;
2. by the activities of the network.

We will discuss both of these in turn.

Areas of Cognitive Systems

The different areas will be grouped so that the large number of issues that are relevant to cognitive systems are covered completely but in a way that allows their inter-relationships to be clear. There are three principal areas:

- 1) The underlying paradigms of cognition;
- 2) The scientific development of cognitive systems, including
 - i) Scientific foundations;
 - ii) Functional capabilities of prototypical systems;
 - iii) Application-specific competences, validation scenarios, and future applications.
- 3) Highly-topical and formative issues.

The underlying paradigms area will be concerned mainly with the alternative viewpoints on the nature of cognition and the implications for building artificial cognitive systems. It is in a sense dealing with the philosophy of cognitive systems, *in an empirical manner*, and will address, for example, cognitivism, connectionism, self-organization, dynamical systems theory, enactive systems & autopoiesis, and artificial life. Cognition at both a microscopic (individual) and macroscopic (social) scales will be included here.

The area of scientific development will be devoted to the practical problems of constructing cognitive systems. Following the lead of the ECVision research roadmap,⁸ it will address this issue along three orthogonal axes:

- i) Scientific foundations;
- ii) Functional capabilities of prototypical systems;
- iii) Application-specific competences, validation scenarios, and future applications.

The *scientific foundations* will address the theoretical models, the algorithmic consideration, and the technological requirements for, e.g., visual, haptic, and aural sensing, representation, memory, learning, recognition, deliberation & reasoning, planning, language & communication, action, as well as the architectural issues concerned with the unified integration of these component foundations.

The constituent *functional capabilities* of cognitive systems address the ability to perform certain functions, from a systems perspective. In a sense, the capabilities represent a first level of integration of the scientific foundations. Typical capabilities will include, e.g., detection & localization of entities in the cognitive system's world, tracking, recognition, classification and categorization, deliberation, prediction, concept formation and visualization, inter-agent communication and expression, planning, and perceptuo-motor coordination.

The third dimension is concerned with the instantiation of *application-specific cognitive systems*, the creation of environments in which they can develop and learn, the assessment of their performance, and the investigation of future applications of the technology.

Finally, the topical issues represent those concerns which transcend all the foregoing matters and which will shape the nature of the discipline in a significant manner. Examples include the nature of and need for embodiment and forcible action, the balance between phylogenetic configuration and ontogenic development, and the architectural problems of system integration.

Activities of the Network

The euCognition activities will cover the four key issues of:

- (a) Outreach
- (b) Scientific Outlook

⁸ www.ecvision.org/research_planning/ECVisionRoadmapv4.2.pdf

- (c) Education
- (d) On-line Resources for the Community

In addition, there will be two support activities, one concerned with *Network Coordination* and the other with *Management of the Consortium*, including financial administration and reporting.⁹

The Outreach activity embraces both inter-project collaboration and the involvement of new blood from both academia and industry. It will include initiatives for bi-lateral exchanges, particularly focusing on individuals, institutes, and companies that are not yet directly involved with funded projects, and providing where necessary the resources for new pilot initiatives (e.g. providing access to platforms for experimental work in embodied cognition).

The Scientific Outlook activity embraces research planning and technology-watch actions. A large amount of effort will be devoted to refining and developing the characterization of cognition that forms the basis of the network at its inception and thereby creating an ambitious but inclusive research agenda. The key focus of this activity is the cross-fertilization of ideas from many areas.

The Education activity is intended to help alleviate the significant difficulties posed by the multi-disciplinary nature of the area. The goal is to provide an effective mechanism to bridge gaps between sub-disciplines and help researchers in one area come up to speed in other areas. It will be targeted both at research practitioners and graduate students. The activities will include the organization of summer schools (or, perhaps, the coordination of the efforts of the Integrated Projects in organizing summer schools) and the creation of teaching material.

The On-line Resources activity focuses on providing a dynamic web-based repository of material that will assist the cognitive systems community, in research, in education, and in assisting in making the relevance and importance of cognitive systems visible to the greater community. Its organization will reflect the operation of the euCognition network, and will be structured by both Activity and Area. The goal is to make this the community's website of choice where they share information and interact with one another. It should also act as catalyst for deployment of cognitive systems technologies by making available show-case results and example validation experiments. The on-line resources will be accessed through www.euCognition.org.

⁹ Note that the Commission guidelines define three types of activities for Coordination Actions: *Training*, *Management of the Consortium*, and *Other Specific Activities*. For the purposes of reporting, the euCognition *Education* activity will correspond to *Training*, while the *Outreach*, *Scientific Outlook*, *On-line Resources*, and *Activity Coordination* activities will be grouped under *Other Specific Activities*.

Areas and Activities

A significant feature of this network is that all activities will apply to each area (and each sub-area). Thus, for example, one could have tutorial material on each of the scientific foundations, or on the paradigms. Similarly, there might be an Outreach initiative dedicated to the validation scenarios, or a Scientific Outlook initiative on integration and architectures. Thus, the work of the network will be distributed in a matrix-like manner, as shown in Table 7.1.

euCognition			Areas of Cognitive Systems				
			Underlying Paradigms	Scientific Development			Topical Issues
				Scientific Foundations	Functional Capabilities	Practical Competences	
Activities of the Network	Outreach	Events					
		Resources					
	Scientific Outlook	Events					
		Resources					
	Education	Events					
		Resources					
	Online Resources						
	Network Coordination						
	Consortium Management						

Table 7.1 : The Two Dimensions of Organization in euCognition

Whilst all cells in this matrix are important, emphasis will be applied dynamically, as needs evolve. Each row and column will be sub-divided further as appropriate.

The euCognition.org website will reflect this structure directly so that someone can gain access to the resources either by area or by activity (or both, with suitable relations qualifying the access). It will act both as our primary mechanism for on-line interaction and our corporate memory. Each cell will present a list (or menu) of available outcomes and the user will have the option of browsing by cell, by activity, or by area (with lists/menus being dynamically constructed).

Process Outputs	Product Outputs
Outreach	

<ul style="list-style-type: none"> - Inaugural meeting - Six-monthly meetings - Inter-project workshops - Extra-network workshops - Special sessions at conferences - Awareness forums at trade fairs & science fairs - Short-term exchange/visits of research staff - Short-term exchange/visits of post-graduate students - Pilot test-bed evaluation of basic cognitive functions - Best demonstration prizes in Cognitive Systems 	<ul style="list-style-type: none"> - Repository of demonstrations of example systems (video clips, images, etc.) - Special issues in journals - Member profiles, indexed by area, interests, physical location, name, etc. - Repository of application-oriented demonstration scenarios to drive R&D - Articles for general readership - Multimedia production for general viewing - <i>Comprehensive dynamic website</i> (see separate specification)
Scientific Outlook	
<ul style="list-style-type: none"> - Thematic Workshops - Conferences - Access to research platforms - Best paper prizes in cognitive systems 	<ul style="list-style-type: none"> - Survey papers on constituent areas - Position papers on topical issues - Research monographs on constituent areas - Research roadmap - Identification or creation of common development environments - Repository of Open Source software - Directory of sources of materials or components, with specifications - Repository of test scenarios, test sets, to assist in quantitative evaluation - Access to / creation of prototype components (hardware & software)
Education	
<ul style="list-style-type: none"> - Summer schools - Tutorials - Prizes for post-graduate work (Ph.D. / M.Sc.) in Cognitive Systems 	<ul style="list-style-type: none"> - Model curricula for cognitive systems - Textbook on cognitive systems - Courseware for constituent areas - Annotated bibliography of publications on cognitive systems

Table 7.2: Outputs of the euCognition Network

Table 7.2 provides a non-exhaustive list of the outputs that will result from euCognition, grouped under the headings of Scientific Outlook, Education, and Outreach. Since the network will operate in an adaptive manner over its life-time, further outputs will be identified as appropriate. In listing these outputs, it is useful to distinguish between process-oriented outputs (e.g. a workshop, tutorial, student exchange, or practical demonstration) and a product-oriented output (e.g. a research roadmap, course notes, or textbook). Process- and product-oriented outputs correspond to events and resources, respectively, in Table 7.1. All outputs, process- or product-oriented, will have some persistent concrete manifestation that can be accessed through the euCognition website.

Workpackage Structure

Each activity is assigned a distinct work-package. Thus, there are six work-packages:

- WP1: Outreach
- WP2: Scientific Outlook
- WP3: Education
- WP4: On-line Resources: the euCognition website
- WP5: Network Coordination
- WP6: Management of the Consortium

Assignment of Responsibility

In a network with many members, none of whom have yet joined, it is not possible to assign specific responsibility for the many tasks that are associated with the three workpackages in each of the three Activities of Outreach, Scientific Outlook, and Education. Instead, responsibility will be assigned dynamically, as members propose Network Actions corresponding to these tasks. On the other hand, responsibility for the euCognition website and management being taken by the coordinating contractor, while responsibility for Network Coordination is shared by the members of the Executive Committee and the Coordinating Contractor.

Deliverable Philosophy

All expenditure of public funds must be open to audit and scrutiny to ensure that the European Union is getting a good return on its investment. In the past, this has often been achieved by requiring each project to produce a number (usually quite a large number) of deliverables which are then assessed against pre-defined targets. Whilst this approach has the advantage of simplicity and transparency, it also tends to inhibit the evolution of a project and the adjustment of its work to new circumstances. euCognition will adopt a different mechanism of audit and review for this coordination action whereby the success of the network will be judged on the outcome of its work in each area and in each activity (and, in particular, in each area-activity pairing).

To make this work effectively, every action (be it a meeting, student exchange, tutorial, course) must have a concrete output that has some persistent form, be it a document, video clip, commentary, or some other type of communicable message. This output will be archived in the euCognition website and will be accessible through an effective (relational) access mechanism. The person who is responsible for each action will upload this output directly to the website and it will be integrated automatically into the repository (flagging its presence to all members). Reimbursement of costs of actions will be conditional upon submission of this output.

An immediate consequence of this approach is that the deliverables are not itemized products (though they will comprise individual outcomes as outlined above) but are rather the components of the euCognition website, populated by the outcomes of events and resources. The extent to which each activity-area pairing is being populated by the membership, and the frequency with which the

resources are being accessed and by whom, will be tracked automatically by the website and these statistics will be made available to the Commission who can then use them as metrics that indicate the success of the Coordination Action.

7.2. Work planning and timetable

Task Name	2006												2007												2008											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
WP1: Outreach																																				
Inter-project Workshops (T1.1)																																				
Extra-network Workshops (T1.2)																																				
Special Sessions at Conferences (T1.3)																																				
Awareness Forums at Trade Fairs & Science Fairs (T1.4)																																				
Short-term Exchange/Visits of Research Staff (T1.5)																																				
Short-term Exchange/Visits of Post-graduate Students (T1.6)																																				
Pilot test-bed Evaluation of Basic Cognitive Functions (T1.7)																																				
Best Demonstration Prizes in Cognitive Systems (T1.8)																																				
Repository of Demonstrations of Example Systems (T1.9)																																				
Special Issues in Journals (T1.10)																																				
Member Profiles (T1.11)																																				
Repository of Application-oriented Demonstration Scenarios (T1.12)																																				
Articles for General Readership (T1.13)																																				
Fairs & Science Fairs activity																																				
Multimedia Production for General Viewing (T1.14)																																				
WP2: Scientific Outlook																																				
Thematic Workshops (T2.1)																																				
Conferences (T2.2)																																				
Access to Research Platforms (T2.3)																																				
Best Paper Prizes in Cognitive Systems (T2.4)																																				
Research Roadmap (T2.5)																																				
Identification/Creation of Common Development Environments (T2.6)																																				
Repository of Open Source Software (T2.7)																																				
Directory of Sources of Materials or Components (T2.8)																																				
Repository of Test Scenarios & Test Sets (T2.9)																																				
Access to / Creation of Prototype Components (T2.10)																																				
WP3: Education																																				
Summer Schools (T3.1)																																				
Tutorials (T3.2)																																				
Prizes for post-graduate work in Cognitive Systems (T3.3)																																				
Model Curricula for a Course on Cognitive Systems (T3.4)																																				
Courseware for Constituent Areas (T3.5)																																				
Textbook on Cognitive Systems (T3.6)																																				
Annotated Bibliography of Publications (T3.7)																																				
WP4: On-line Resources - the euCognition website																																				
Creation of temporary website (T4.1)																																				
Specification and design of final website (T4.2)																																				
Website implementation (T4.3)																																				
Website launch and evaluation (T4.4)																																				
Website Maintenance and on-going development (T4.5)																																				
WP5: Network Coordination																																				
Organization of six-monthly Network meetings(T5.1)																																				
Organization of Executive Committee meetings(T5.2)																																				
Organization of Coordinator's Round-Table Forum meetings(T5.3)																																				
Processing of applications for funding of Network Actions (T5.4)																																				
Monitor progress of Network Activities (T5.5)																																				
Moderation of euCognition mailing list correspondence (T5.6)																																				
WP6: Management of the Consortium																																				
Processing of applications for membership (T6.1)																																				
Processing and reimbursement of members' costs (T6.2)																																				
Prepare consolidated financial report (T6.3)																																				
Collection and collation of audit certificates (T6.4)																																				
Liaison with Commission Project Officer (T6.5)																																				
Collection and distribution of deliverables (T6.6)																																				
Monitoring of project budget against expenditure (T6.7)																																				
Collation six-monthly management reports (T6.8)																																				
Preparation and issue of sub-contracts (T6.9)																																				
Maintenance of member database (T6.10)																																				

7.3. Graphical presentation of work packages

Not applicable

7.4. Work package list

Work-package No.	Work package title	Lead contractor No.	Person-months	Start month	End month	Deliverable No.
WP 1	Outreach	5	23	1	36	1
WP 2	Scientific Outlook	4	23	1	36	2
WP 3	Education	3	23	1	36	3
WP 4	On-line Resources	1	15	1	36	4
WP 5	Network Coordination	1	6	1	36	5
WP 6	Project Management	1	12	1	36	6
	TOTAL		102			

7.5. Deliverables list

Del. No	Deliverable name	WP No.	Lead participant	Est. person-months	Nature ¹⁰	Dissemination level ¹¹	Delivery date ¹² (proj. month)
1	Outreach online resources	1	5	23	R/P/D	PU	36
2	Scientific outlook online resources	2	4	23	R/P/D	PU	36
3	Education online resources	3	3	23	R/P/D	PU	36
4	euCognition website	4	1	15	R/P/D	PU	36
5	Network coordination online resources	5	1	6	R/P/D	PU	36
6	Consortium management online resources	6	1	10	R/P/D	PU	36
7	Final plan for using and disseminating knowledge	6	1	1	R/P/D	PU	36
8	Report on raising public participation and awareness	6	1	1	R/P/D	PU	36
TOTAL				170			

¹⁰ Please indicate the nature of the deliverable using one of the following codes:

R = Report

P = Prototype

D = Demonstrator

O = Other

¹¹ Please indicate the dissemination level using one of the following codes:

PU = Public

PP = Restricted to other programme participants (including the Commission Services).

RE = Restricted to a group specified by the consortium (including the Commission Services).

CO = Confidential, only for members of the consortium (including the Commission Services).

¹² Although the formal delivery date is Month 36, every deliverable will be created incrementally throughout the duration of the project, with each component being made available on the euCognition website. Statistics on the current population of each deliverable and access by members will be available on-line to allow continuous assessment by the Commission.

7.6. Work package descriptions

WP1 – Outreach

Workpackage number	1		Start date or starting event:					Month 1				
Activity Type	Coordination											
Participant id.r	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other	
Person-months per participant	1	1	1	1	1	1	1	2	1	1	12	

Objectives

The Outreach activity embraces both inter-project collaboration and the involvement of new blood from both academia and industry. It will include initiatives for bi-lateral exchanges, particularly focusing on individuals, institutes, and companies that are not yet directly involved with funded projects, and providing where necessary the resources for new pilot initiatives (e.g. providing access to platforms for experimental work in embodied cognition).

Description of work

Process-oriented Tasks: euCognition Events

Inaugural Meeting (T1.1)

An inaugural meeting will be organized to launch the network. This meeting will address several issues. It will provide a forum where people, members and external guests, can raise and debate the concerns that are critical to the advancement of the scientific foundation for engineering artificial cognitive systems. It will also provide an opportunity to explain the many operating procedures in the network. Finally, it will begin the process of creating a common agenda and understanding among people from the many disparate disciplines comprising cognitive systems.

Six-Monthly Meeting (T1.2)

A general network meeting will be organized every six months. These will be working meetings, covering both topics issues, activity-specific issues, and area-specific issues. Operational issues will also be covered.

Inter-project Workshops (T1.3)

The diversity of possible approaches to the modeling of cognition and the design of cognitive systems brings many problems. From an operational perspective, one of the main problems is that individual projects will quite naturally adopt individual approaches and somewhat restricted perspectives, even if these approaches are multi-disciplinary. The danger is that this will result in several islands of results. The goal behind the inter-project workshops is to try to help stop this happening by providing a structured forum where projects can talk freely about their ideas and difficulties, and perhaps learn from each others experiences. These workshops will augment the Cognitive Systems Project Coordinators Round-Table meetings which will be more concerned with dealing with these problems at an organizational level.

Extra-network Workshops (T1.4)

The complement of the inter-project workshops is the programme of extra-network workshops. The goal here is to provide a mechanism to induct new ideas into the community by conducting workshops that target people who are not part of current EU-funded cognitive systems projects and facilitate their participation in a forum for discussion on any (and all) of the component areas of cognitive systems.

Special Sessions at Conferences (T1.5)

This action will focus on fostering (and where appropriate sponsoring) special sessions in the conferences on cognitive systems and all cognate disciplines in order to raise the profile of the area and high-light the interdisciplinary and topical nature of the science. This activity will complement the Conferences action under the Scientific Outlook Activity detailed below. The idea is to target disciplines such as developmental psychology, acoustic perception, neuroscience, computer vision, adaptive robotics etc. and try to create sessions devoted to artificial cognitive systems. A example of the type of conference we would target is the Post-Cognitivist Psychology Conference 2005 (<http://www.strath.ac.uk/conferences/postcog2005/>) which serves researchers in the fields of “embodied cognition, discursive cognition, situated cognition, distributed cognition, artificial life, post-Chomskyan linguistics, activity theory, and ecological (Gibsonian) psychology” but doesn’t have a session devoted to artificial cognitive systems.

Awareness Forums at Trade Fairs & Science Fairs (T1.6)

In euCognition, we would like to go beyond the normal outreach to researchers in the many cognate disciplines of cognitive systems. In particular, we intend to reach out to the community at large to help explain the relevance, opportunities, and challenges of artificial cognitive systems. We see this as a way of providing solid information that can help people understand the discipline, its capabilities, and its limitations. In a sense, this is an educational process, but at the conceptual level rather than the theoretical or technological level. It will result in, we expect, a more informed and supportive public and a new source of interest in developing the discipline.

Short-term Exchange/Visits of Research Staff (T1.7)

The best way to achieve technology transfer is to exchange people, because it is people that carry the know-how that makes theoretical and empirical research useful. This action will facilitate the exchange of research staff between labs, targeting in particular (but not exclusively) people who are not presently supported by on-going EU-funded projects. We also see this as an excellent way of providing participants from newly-inducted EU members states with a way of becoming involved in the programme.

There will be a few simple guidelines for these exchanges:

- The work to be done during the exchange must have cognitive systems as its focus.
- Visits by people who are not members of euCognition will receive priority treatment, as will visits by people to members with whom they do not presently have a formal (funded) collaboration.
- Visits by people who are already part of an EU-funded consortium will only be supported in exceptional circumstances and with strong justification.
- Members who are already funded by IST cognitive systems projects must provide a letter from the project coordinator stating that the costs of the visit are not payable under their project contact.

euCognition will pay travel costs subject to the normal guidelines and will make a contribution to subsistence and accommodation costs on the following basis:

- Visits of 10 days or less: €150 per day (normal rate).
- Visits longer than 10 days: €150 for the first 10 days, €75 per day thereafter.
- Visits longer than 90 days will be subject to negotiation.

As always, successful applicants must submit a short report setting out the concrete outcome of the visit with their request for reimbursement of costs.

Short-term Exchange/Visits of Post-graduate Students (T1.8)

This action is simply the counterpart of the research staff exchange action described above. The same emphasis applies here also. Students must have attained their primary degree and must be working for a higher degree, i.e. masters or doctorate.

Pilot test-bed Evaluation of Basic Cognitive Functions (T1.9)

This Outreach activity is intended to foster relationships between industrial players (not necessarily members of euCognition) and researchers & developers. The idea is to provide a mechanism whereby an industrial player can propose application scenarios that are particularly relevant to their commercial interests and arrange for R&D personnel to ‘try out’ and evaluate the cognitive functionality they have been developing as a pilot test-bed application. These test-bed pilots would augment the validation and evaluation work that would in any case be part of the funded project work and would help researchers exercise their systems in other domains without cost or penalty.

Best Demonstration Prizes in Cognitive Systems (T1.10)

This activity supplements the previous one by providing a means of recognizing and rewarding particularly effective deployment of cognitive functions in test-bed scenarios. Both pilot test-bed action and the normal project evaluation demonstrators will be eligible.

Product-oriented Tasks: euCognition Resources*Repository of Demonstrations of Example Systems (T1.11)*

The primary focus in this activity will be to collect and make available material that helps show off the success of research activity in a way that is accessible to a non-expert audience. This material will include, for example, video clips, images, short abstracts, etc. This material will also be used to augment the work in preparation of course material under the *Education* activity.

Special Issues in Journals (T1.12)

This activity complements the Special Sessions in Conferences activity. It aims at fostering (and where appropriate sponsoring) special issues in the journals on cognitive systems and all cognate disciplines in order to raise the profile of the area and high-light the inter-disciplinary and topical nature of the science.

Member Profiles (T1.13)

The euCognition website will have a repository of the profile of each member, indexed by area, interests, physical location, contact details, etc.

Repository of Application-oriented Demonstration Scenarios to Drive R&D (T1.14)

This resource will complement the *Pilot test-bed evaluation of basic cognitive functions* activity and the *Repository of Demonstrations of Example Systems* resource, providing details of applications, situations, and scenarios which require cognitive functionality. The aim is to provide a source of ideas for exploitation of the scientific work of the members of euCognition.

Articles for General Readership (T1.15)

As we have noted several times already, a major component of the Outreach activity is to go beyond the normal outreach to researchers and to reach out to the community at large to help explain the relevance, opportunities, and challenges of artificial cognitive systems. We see this as a way of providing solid information that can help people understand the discipline, its capabilities, and its limitations. This resource complements the *Awareness Forums at Trade Fairs & Science Fairs* activity.

Multimedia Production for General Viewing (T1.6)

This resource is intended to be resource that consolidates the best of the material from all of the foregoing Outreach activities with a particular focus on popular audiences.

Deliverables

EuCognition website populated with product-oriented (events) and process-oriented (resources) outcomes for this activity, distributed across the spectrum of cognitive system areas.

Milestones and expected result

The output of the network will be subject to continuous scrutiny and assessment, facilitated by the availability of statistics on (a) the population of the website by the membership, broken down by each cell in the activity / area matrix, and (b) the frequency with which the resources are being accessed and by whom. The expected result is that we will achieve our four objectives:

- Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
- Provide support for the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
- Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
- Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

WP2 – Scientific Outlook

Workpackage number	2		Start date or starting event:					Month 1			
Activity Type	Coordination										
Participant id.r	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other
Person-months per participant	1	1	1	1	1	1	1	2	1	1	12

Objectives

The Scientific Outlook activity embraces research planning and technology-watch actions. A large amount of effort will be devoted to refining and developing the characterization of cognition that forms the basis of the network at its inception and thereby creating an ambitious but inclusive research agenda. The key focus of this activity is the cross-fertilization of ideas from many areas.

Description of work

Process-oriented Tasks: euCognition Events

Thematic Workshops (T2.1)

We plan to organize a full programme of Thematic Workshops over the lifetime of the Network. These workshops are one of the primary mechanisms for advancing our consensual understanding both of the discipline as a whole and its constituent areas. At the outset, we will adopt the area decomposition already described (underlying paradigms, scientific development, including foundations, functionality, and competences, and topical issues) and the workshops will develop and adapt these themes. The output from these workshop will feed directly into the Research Roadmap resource to be described below.

Conferences (T2.2)

To complement the thematic workshops, each of which will be concerned with developing individual components of the discipline, we plan to organize an international conference on artificial cognitive systems to allow researchers a more open and broadly-based forum to share their views and experiences. Ideally, this conference would become an annual event.

Access to Research Platforms (T2.3)

As we noted already, a key focus of this activity is the cross-fertilization of ideas from many areas. One way we can achieve this is to provide a mechanism to support people from one field of endeavour in gaining access to research platforms that are being developed by others. This will allow researchers to engage in exploratory investigations, prior to committing to a full research programme on that platform. In the case of embodied cognition, for example, this activity can be used to allow developmental psychologists to conduct some experiments on a humanoid system. Similarly, it would help provide industrial researchers with an opportunity to get some exposure to a research lab. software development environment. This activity complements the staff and student exchange actions under the Outreach activity.

Best Paper Prizes in Cognitive Systems (T2.4)

The euCognition Network would like to encourage first-class in research in cognitive systems, especially the cross-disciplinary aspects. One of the ways we will do this is by offering recognition for excellent work by sponsoring best paper prizes at relevant conferences. This complements the M.Sc. / Ph.D. prizes in the Education activity.

Product-oriented Tasks: euCognition Resources

Research Roadmap (T2.5)

The aim of this activity is to build, by consensus, a picture of the current state-of-the-art in cognitive systems and to construct a 'research roadmap' which will identify the key problems and some potential avenues for attacking them. This roadmap will adopt the three-part structure of cognitive systems identified in this proposal (i.e. the cognitive system areas) to get the work underway. However, an important aspect of this activity is to develop this model and add more depth to the scientific considerations and expand the links into the cognate disciplines of, e.g., developmental psychology, neuroscience, and adaptive & epigenetic robotics. If disciplinary diversity is a pre-eminent characteristic of cognitive systems, then the research roadmap exercise is an effort to create unity through diversity.

The research roadmap exercise is a major undertaking and it will be supported by other initiatives and resources in euCognition. These will include the creation of the following resources:

- *Survey Papers on Constituent Areas*
- *Position Papers on Topical Issues*
- *Research Monographs on Constituent Areas*

Operationally, it will be supported by the Thematic Workshops described above.

Identification or Creation of Common Development Environments (T2.6)

Following on from the theme of 'unity in diversity', one way to achieve this is to adopt, where possible, common development environments. Our goal here is to either identify appropriate environments or help support those who are developing such environments, by providing input on needs and requirements and by providing, if necessary, modest financial support.

Repository of Open Source Software (T2.7)

A very healthy characteristic of many of the on-going cognitive systems projects is that they are adopting the Open Source / Free Software (OSS/FS) model, making their work available to the community and requiring that derivative works are also kept open and free. This will greatly help the collaborative development of the discipline. The euCognition network will make its resources available to provide a central repository (or mirror site) for this open software.

Directory of Sources of Materials or Components (T2.8)

The area of embodied cognition brings with it its own special problems. One of these is the difficulties in sourcing materials and components to construct the embodied platform. These components range from sensing systems (vision, haptic, vestibular) through to the limbs (members) and actuators. This action is intended help researchers share information on these issues by creating a directory of material and components, complete with specifications and sources.

Repository of Test Scenarios & Test Sets (T2.9)

The very essence of research in cognitive systems is to create systems that can operate effectively in scenarios that exhibit characteristics (or variability) that weren't anticipated when designing the system in the first place. Consequently, the validation of these systems is difficult to plan in advance. However, with that said, there is still a place in the validation & evaluation cycle for 'canned' test scenarios, at the very least to allow some objective comparative analysis of systems. This action is intended to create a repository of these test scenarios and test sets for the euCognition community to facilitate this quantitative evaluation.

Access to / Creation of Prototype Components (T2.10)

We noted in the action on Access to Research Platforms that there is significant merit in allowing researchers to engage in exploratory investigations, prior to committing to a full research programme. The counterpart to this on a much smaller scale is to provide a way to help researchers establish the feasibility of some exploratory ideas for either hardware or software components without having them included on the critical path of their mainstream research programme. This action will fulfil this need and will provide a resource to allow researchers to create and experiment with new technologies, and then share them with others.

Deliverables

EuCognition website populated with product-oriented (events) and process-oriented (resources) outcomes for this activity, distributed across the spectrum of cognitive system areas.

Milestones and expected result

The output of the network will be subject to continuous scrutiny and assessment, facilitated by the availability of statistics on (a) the population of the website by the membership, broken down by each cell in the activity / area matrix, and (b) the frequency with which the resources are being accessed and by whom. The expected result is that we will achieve our four objectives:

- Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
- Provide support the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
- Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
- Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

WP3 – Education

Workpackage number	3		Start date or starting event:					Month 1			
Activity Type	Coordination										
Participant id.r	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other
Person-months per participant	1	1	1	1	1	1	1	2	1	1	12

Objectives

The Education activity is intended to help alleviate the significant difficulties posed by the multi-disciplinary nature of the area. The goal is to provide an effective mechanism to bridge gaps between sub-disciplines and help researchers in one area come up to speed in other areas. It will be targeted both at research practitioners and graduate students. The activities will include the organization of summer schools (or, perhaps, the coordination of the efforts of the Integrated Projects in organizing summer schools) and the creation of teaching material.

Description of work

Process-oriented Tasks: euCognition Events

Summer Schools (T3.1)

The goal of this task is to organize a general programme of summer schools, ideally running three schools during the period of the contract. Since the Integrated Projects also have a responsibility to organize a similar activity, we will coordinate with these projects to produce the most effective and comprehensive programme possible. Course material will be made available on the euCognition website.

Tutorials (T3.2)

The Tutorial events are less comprehensive than the summer schools, typically being restricted to one or two key topics in the area. Our goal is to run as many of these as is feasible and to make the tutorial material available on the euCognition website.

Prizes for post-graduate work (Ph.D. / M.Sc.) in Cognitive Systems (T3.3)

The euCognition Network would like to encourage post-graduate teaching & research in cognitive systems, especially the cross-disciplinary aspect. One of the ways we will do this is by offering recognition for excellent work, typically based on either dissertations or papers that have been produced by the students. This complements the best paper prizes in the Outreach activity.

Product-oriented Tasks: euCognition Resources

Model Curricula for a Course on Cognitive Systems (T3.4)

Because there are many constituent disciplines in the general area of Cognitive Systems, it makes it very difficult to create a comprehensive course that delivers material in a sufficiently-deep manner to be meaningful. This activity will attempt to create an overarching curriculum, with guidance on how difference aspects of the curriculum can be extended, depending on the focus that a lecturer wishes for the course.

Courseware for Constituent Areas (T3.5)

We have identified three principal areas in Cognitive Systems:

- 1) The underlying paradigms of cognition;
- 2) The scientific development of cognitive systems, including
 - i) Scientific foundations;
 - ii) Functional capabilities of proto-typical systems;
 - iii) Application-specific competences, validation scenarios, and future applications.
- 3) Highly-topical and formative issues.

This activity will concentrate on the creation of teaching material for each of these areas and any relevant sub-area. To a great degree, it will complement the curriculum activity and will proceed in parallel. Ultimately, the two activities should converge, with a substantial amount of teaching material being created to support the model curriculum.

Textbook on Cognitive Systems (T3.6)

Writing a text-book on cognitive systems is a very great challenge. We include it as a complementary activity to the model curriculum and the courseware activities, one which will benefit greatly from their experiences and which in turn may help guide them. If we can facilitate the creation of a good text, we will have accomplished a great deal.

Annotated Bibliography of Publications on Cognitive Systems (T3.7)

This activity is concerned with the creation of an indexed and annotated bibliography of publications. The activity will be divided into two principal tasks:

1. The identification and indexing of source material, and the creation of abstracts. This material will be encapsulated in a marked-up BibTeX bibliography file.
2. The development of a utility that will convert the marked-up BibTeX file to a suite of web pages, including an index page (or set of index pages), bibliography page, and abstract page.

The goal is to have the marked up bibtex file stored in the euCognition relational database system on the euCognition server (see Work-package 4) and to create the indices, abstracts, etc. dynamically. We will also integrate a relational keyword search facility.

Deliverables

EuCognition website populated with product-oriented (events) and process-oriented (resources) outcomes for this activity, distributed across the spectrum of cognitive system areas.

Milestones and expected result

The output of the network will be subject to continuous scrutiny and assessment, facilitated by the availability of statistics on (a) the population of the website by the membership, broken down by each cell in the activity / area matrix, and (b) the frequency with which the resources are being accessed and by whom. The expected result is that we will achieve our four objectives:

- Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
- Provide support the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
- Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
- Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

WP4 – Online Resources

Workpackage number	4		Start date or starting event:					Month 1			
Activity Type	Coordination										
Participant id.r	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other
Person-months per participant	15	0	0	0	0	0	0	0	0	0	0

Objectives

This work-package focuses on providing a dynamic web-based repository of material that will assist the cognitive systems community, in research, in education, and in assisting in making the relevance and importance of cognitive systems visible to the greater community.

Description of work

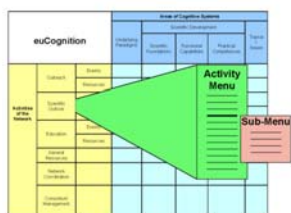
The website will reflect the operation of the euCognition network, and will be structured by both Activity and Area so that someone can gain access to the resources either by area or by activity (or both, with suitable relations qualifying the access).

The website content browser will have three different views:

1. Cell (activity and area) view
2. Activity view
3. Area view

so that the user will have the option of browsing by cell, by activity, or by area.

Each view will have a context-dependent menu facility. Specifically, each cell, area, or activity will present a list (or menu) of available resources, listed in a manner that is appropriate for that view. That is, the menus will be dynamically constructed to reflect the view that is currently invoked.



The website will also have a ‘recent events auto-pilot’ that will automatically flag new items on the site since the previous visit by the current user. The user will be able to configure the autopilot to scan these new items by data, activity, or area. A facility will be provided to launch a new window to inspect any of these items so as not to interrupt the scan sequence and disrupt the user’s session.

Both free search and guided keyword search facilities will be provided.

Recall that the submission of some form of persistent outcome is a prerequisite for reimbursement of costs associated with funded Network Actions. To facilitate this, there will also be an upload facility to allow members to contribute items to the website. Once the uploaded item has been reviewed by the website Data Administrator (in the first instance, this will be the Network Coordinator), the item will be flagged to all the members.

A general bulletin board will also be provided to allow members to communicate with each other (without having to use email). This facility will also act as a general news bulletin facility. A login procedure will probably be required to restrict access to euCognition members when posting information to the website. It may be possible to by-pass this and authenticate membership automatically by reverse IP lookup; we will investigate this option to ensure that the easiest possible use of the website for members.

In order to enable the provision of these services, and the addition of others in due course, the website will be constructed using a server-side relational database system (probably MySQL) and server-side scripts (probably PHP), with client-side dynamics being implemented using Javascript.

The ultimate goal is to make this the community's 'common room' where they share information and interact with one another. It should also act as catalyst for deployment of cognitive systems technologies by making available show-case results and example validation experiments. The on-line resources will be accessed through www.euCognition.org (this domain has already been acquired by the network coordinator).

The creation of the website will comprise several tasks:

- Creation of temporary website (T4.1)
- Specification and design of final website (T4.2)
- Website implementation (T4.3)
- Website launch and evaluation (T4.4)
- Website Maintenance and on-going development (T4.5)

We plan to have an initial version of the dynamic website up and running within the first three months (or earlier if possible). Prior to that, a simple website with essential functionality will be created and maintained.

Deliverables

EuCognition website populated with product-oriented (events) and process-oriented (resources) outcomes for this activity, distributed across the spectrum of cognitive system areas.

Milestones and expected result

The output of the network will be subject to continuous scrutiny and assessment, facilitated by the availability of statistics on (a) the population of the website by the membership, broken down by each cell in the activity / area matrix, and (b) the frequency with which the resources are being accessed and by whom. The expected result is that we will achieve our four objectives:

- Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
- Provide support the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
- Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
- Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

WP5 – Network Coordination

Workpackage number	5		Start date or starting event:					Month 1			
Activity Type	Coordination										
Participant id.r	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other
Person-months per participant	6	0	0	0	0	0	0	0	0	0	0

Objectives

WP5 deals with the coordination of the network activities and monitoring the coordination of the Network Actions leading to the required outcomes, in particular. The work focuses on the coherent development of the activities of the network overall, on building an integrated community within the network, on maximizing the interaction between the various activities and areas, and on ensuring that the network is as relevant as possible to all concerned: the membership, the cognitive systems community, and the community at large.

Description of work

The tasks that are included in this work-package are:

1. Organization of six-monthly Network meetings(*T5.1*):
Venue, Agenda, Presentations, Minutes/Reports;
2. Organization of Executive Committee meetings (*T5.2*):
Venue, Agenda, Presentations, Minutes/Reports;
3. Organization of Cognitive Systems Coordinator's Round-Table Forum meetings(*T5.3*):
Venue, Agenda, Presentations, Minutes/Reports;
4. Processing of applications for funding of Network Actions by members(*T5.4*):
 - Distribution to Executive Committee,
 - Review and Decision,
 - Liaison with Commission for Approval,
 - Issue of Agreement,
 - Launch of Open Call for Tender (Labour Component),
 - Collation of Tenders,
 - Coordination of evaluation of tenders,
 - Liaison with Commission for Approval,
 - Issue of sub-contract.
5. Monitor progress of Network Activities and implementing corrective action (*T5.5*).
6. Moderation of euCognition mailing list correspondence (*T5.6*).

Deliverables

EuCognition website populated with product-oriented (events) and process-oriented (resources) outcomes for this activity, distributed across the spectrum of cognitive system areas.

Milestones and expected result

The output of the network will be subject to continuous scrutiny and assessment, facilitated by the availability of statistics on (a) the population of the website by the membership, broken down by each cell in the activity / area matrix, and (b) the frequency with which the resources are being accessed and by whom. The expected result is that we will achieve our four objectives:

- Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
- Provide support the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
- Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
- Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

WP6 – Management

Workpackage number	6		Start date or starting event:					Month 1			
Activity Type	Management										
Participant id.r	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other
Person-months per participant	12	0	0	0	0	0	0	0	0	0	0

Objectives

WP6 deals with management of the consortium management and focuses mainly on handling the financial aspects such as reimbursement of claims for costs to members, reporting, and other contractual issues.

Description of work

The tasks that are included in this work-package are:

1. Processing of applications for membership (T6.1):
 - Distribution to Executive Committee,
 - Review and Decision,
 - Issue of Agreement,
 - Coordination of preparation of contract for new contractors
2. Processing and reimbursement of members' costs (T6.2):
 - Preparation of guidelines for reimbursement,
 - Logging receipt of claim,
 - Checking against guidelines,
 - Preparation of request for bank transfer of funds.
3. Prepare consolidated financial report (T6.3);
4. Collection and collation of audit certificates (T6.4);
5. Liaison with Commission Project Officer (T6.5);
6. Collection and distribution of deliverables (T6.6);
7. Monitoring of project budget against expenditure (T6.7);
8. Collation six-monthly management reports (T6.8);
9. Preparation and issue of sub-contracts (T6.9);
10. Maintenance of member database (T6.10).

Deliverables

D6: EuCognition website populated with product-oriented (events) and process-oriented (resources) outcomes for this activity, distributed across the spectrum of cognitive system areas.

D7: Final plan for using and disseminating knowledge

D8: Report on raising public participation and awareness

Milestones and expected result

The output of the network will be subject to continuous scrutiny and assessment, facilitated by the availability of statistics on (a) the population of the website by the membership, broken down by each cell in the activity / area matrix, and (b) the frequency with which the resources are being accessed and by whom. The expected result is that we will achieve our four objectives:

- Facilitate broad multi-disciplinary involvement, inter-disciplinary discourse, and lively cross-paradigm debate;
- Provide support the research community that is already involved in FP6 cognitive systems projects and help other individuals from research institutes and companies become involved in this initiative;
- Enable the effective articulation of the relevance and importance of cognitive systems to the wider and more general community.
- Create an extensive dynamic web-based repository resources to facilitate research, education, and outreach to the greater community.

8. Project Resources and budget overview

8.1. Effort for the project

Project No 26408 (euCognition)

	UGDIST	UCD	TUW	HIS	LIU	RUB	AS	CNRS	MPI	UKE	Other
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Coordination activities											
WP1	1	1	1	1	1	1	1	2	1	1	12
WP2	1	1	1	1	1	1	1	2	1	1	12
WP3	1	1	1	1	1	1	1	2	1	1	12
WP4	17										
WP5	6										
WP6											
Total Coordination	26	3	3	3	3	3	3	6	3	3	36


Training activities											
WP1											
WP2											
WP3											
WP4											
WP5											
WP6											
Total Training											


Consortium management activities											
WP1											
WP2											
WP3											
WP4											
WP5											
WP6	12										
Total consortium management	12										

Total per Participant	38										
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Overall Total Effort	38	3	3	3	3	3	3	6	3	3	36
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8.2. Overall budget for the project

Contract Preparation Forms									
		EUROPEAN COMMISSION 6th Framework Programme on Research, Technological Development and Demonstration		Coordination Action			A3.1		
Please use as many copies of form A3.1 as necessary for the number of partners									
Proposal Number		026408		Proposal Acronym			euCognition		
Financial information - whole duration of the project									
Partici- pant n°	Organisation short name	Cost model used	Estimated eligible costs and requested EC contribution (whole duration of the project)	Costs and EC contribution per type of activities			Total (4)=(1)+(2)+ (3)	Total receipts	
				Coordination activities (1)	Training activities (2)	Consortium Management activities (3)			
10	UKE	AC	Direct Costs (a)	28,500.00	.00	.00	28,500.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	5,700.00	.00	.00	5,700.00		
			Total eligible costs (a)+(b)	34,200.00	.00	.00	34,200.00		
			Requested EC contribution	34,200.00	.00	.00	34,200.00		
9	MPI	AC	Direct Costs (a)	31,500.00	.00	.00	31,500.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	6,300.00	.00	.00	6,300.00		
			Total eligible costs (a)+(b)	37,800.00	.00	.00	37,800.00		
			Requested EC contribution	37,800.00	.00	.00	37,800.00		
8	CNRS	FCF	Direct Costs (a)	54,000.00	.00	.00	54,000.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	10,800.00	.00	.00	10,800.00		
			Total eligible costs (a)+(b)	64,800.00	.00	.00	64,800.00		
			Requested EC contribution	64,800.00	.00	.00	64,800.00		
7	APPLIANCE STUDIO	FCF	Direct Costs (a)	31,200.00	.00	.00	31,200.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	6,240.00	.00	.00	6,240.00		
			Total eligible costs (a)+(b)	37,440.00	.00	.00	37,440.00		
			Requested EC contribution	37,440.00	.00	.00	37,440.00		
6	RUB	AC	Direct Costs (a)	27,000.00	.00	.00	27,000.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	5,400.00	.00	.00	5,400.00		
			Total eligible costs (a)+(b)	32,400.00	.00	.00	32,400.00		
			Requested EC contribution	32,400.00	.00	.00	32,400.00		
5	LIU	AC	Direct Costs (a)	27,000.00	.00	.00	27,000.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	5,400.00	.00	.00	5,400.00		
			Total eligible costs (a)+(b)	32,400.00	.00	.00	32,400.00		
			Requested EC contribution	32,400.00	.00	.00	32,400.00		
4	HIS	AC	Direct Costs (a)	24,000.00	.00	.00	24,000.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	4,800.00	.00	.00	4,800.00		
			Total eligible costs (a)+(b)	28,800.00	.00	.00	28,800.00		
			Requested EC contribution	28,800.00	.00	.00	28,800.00		
3	TUW	AC	Direct Costs (a)	19,500.00	.00	.00	19,500.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	3,900.00	.00	.00	3,900.00		
			Total eligible costs (a)+(b)	23,400.00	.00	.00	23,400.00		
			Requested EC contribution	23,400.00	.00	.00	23,400.00		
2	NUID/UCD	AC	Direct Costs (a)	29,100.00	.00	.00	29,100.00	.00	
			of which subcontracting	.00	.00	.00	.00		
			Indirect costs (b)	5,820.00	.00	.00	5,820.00		
			Total eligible costs (a)+(b)	34,920.00	.00	.00	34,920.00		
			Requested EC contribution	34,920.00	.00	.00	34,920.00		
1	UG	AC	Direct Costs (a)	976,463.00	.00	90,000.00	1,066,463.00	.00	
			of which subcontracting	30,000.00	.00	.00	30,000.00		
			Indirect costs (b)	189,293.00	.00	18,000.00	207,293.00		
			Total eligible costs (a)+(b)	1,165,756.00	.00	108,000.00	1,273,756.00		
			Requested EC contribution	1,165,756.00	.00	108,000.00	1,273,756.00		
TOTAL			Eligible costs	1,491,916.00	.00	108,000.00	1,599,916.00	.00	
			Requested EC contribution	1,491,916.00	.00	108,000.00	1,599,916.00		

Contract Preparation Forms	
 EUROPEAN COMMISSION 6th Framework Programme on Research, Technological Development and Demonstration	<h2 style="margin: 0;">Coordination Action</h2> <div style="text-align: right; font-size: 2em; font-weight: bold; margin-top: 20px;">A3.2</div>

Proposal Number	026408	Proposal Acronym	euCognition	
Estimated breakdown of the EC contribution per reporting period				
Reporting Periods	Start month	End month	Estimated Grant to the Budget	
			Total	In which first six months
Reporting Period 1	1	12	573,626.00	.00
Reporting Period 2	13	24	520,345.00	280,172.50
Reporting Period 3	25	36	505,945.00	252,972.50
Reporting Period 4			.00	.00
Reporting Period 5			.00	.00
Reporting Period 6			.00	.00
Reporting Period 7			.00	.00

8.3. Management level description of resources and budget

Baseline Data	
All euCognition costs are derived from this baseline data	
Membership Numbers	
Number of members at full strength	120
Number of members of the Executive Committee	12
Number of coordinators of Cognitive Systems Projects	22
Estimated average participation rate at six-monthly meetings (%)	40
Estimated average participation rate at thematic meetings (%)	20
Estimated average participation rate at coordinator round table forum meetings (%)	75
Number of members participating at six-monthly meetings	48
Number of members participating at thematic meetings	24
Number of members participating at coordinator round table forum meetings	17
Number of Executive Committee members charging time to activity coordination (excluding subcontract)	10
Labour Costs	
Executive Committee average monthly labour rate coordination	9060
Coordinator average monthly labour rate	9000
Technical monthly labour rate	6000
Administrative monthly labour rate	3000
Subcontracted labour (Executive Committee member)	10000
Effort Estimates	
Network coordination effort (person-months); Year 1	2
Network coordination effort (person-months); Year 2	2
Network coordination effort (person-months); Year 3	2
Activity coordination effort per Executive Committee member per year (person-months)	1
Website coordination effort (person-months); Year 1	1
Website coordination effort (person-months); Year 2	1
Website coordination effort (person-months); Year 3	1
Consortium management coordinator effort per year (person-months)	3
Consortium management administration effort per year (person-months)	1
Website effort (person-months); Year 1	6
Website effort (person-months); Year 2	4
Website effort (person-months); Year 3	2
Website infrastructure costs (annual)	450
Meeting Data	
Number of thematic meetings per year per activity (estimated average)	2
Number of network meetings per year	2
Number of Executive Committee meetings per year held apart from six-monthly meetings	1
Number of coordinator round-table forum meetings per year held apart from six-monthly meetings	1
Travel cost of network meetings per person (estimated average)	600
Average cost of meeting facilities / participant	75
Action Costs	
Number of actions per activity / year (estimated average)	4
Average personnel cost per action	4000
Average travel cost per action	2000

Outreach					
	Year 1	Year 2	Year 3	Total	% of Total
Coordination	€	€	€	€	
Personnel	30200	30200	30200	90600	
Sub-Total	30200	30200	30200	90600	
Actions	€	€	€	€	
Personnel	16000	16000	16000	48000	
Travel	8000	8000	8000	24000	
Thematic/Activity Workshops	32400	32400	32400	97200	
Sub-Total	56400	56400	56400	169200	
Total for Target Area	86600	86600	86600	259800	19.9

Scientific Outlook					
	Year 1	Year 2	Year 3	Total	% of Total
Coordination	€	€	€	€	
Personnel	30200	30200	30200	90600	
Sub-Total	30200	30200	30200	90600	
Actions	€	€	€	€	
Personnel	16000	16000	16000	48000	
Thematic/Activity Workshops	32400	32400	32400	97200	
Travel	8000	8000	8000	24000	
Sub-Total	56400	56400	56400	169200	
Total for Target Area	86600	86600	86600	259800	19.9

Education					
	Year 1	Year 2	Year 3	Total	% of Total
Coordination	€	€	€	€	
Personnel	30200	30200	30200	90600	
Sub-Total	30200	30200	30200	90600	
Actions	€	€	€	€	
Personnel	16000	16000	16000	48000	
Thematic/Activity Workshops	32400	32400	32400	97200	
Travel	8000	8000	8000	24000	
Sub-Total	56400	56400	56400	169200	
Total for Target Area	86600	86600	86600	259800	19.9

Online Resources: euCognition Website					
	Year 1	Year 2	Year 3	Total	% of Total
Coordination	€	€	€	€	
Personnel	45000	33000	21000	99000	
Infrastructure & Hosting	450	450	450	1350	
Total	45450	33450	21450	100350	7.7

Network Coordination including Executive Committee, Six-Monthly, & Round-Table Meetings					
	Year 1	Year 2	Year 3	Total	% of Total
Personnel	€	€	€	€	
Personnel	18000	18000	18000	54000	
Six-monthly meetings	97200	64800	64800	226800	
Executive Committee meetings	8100	8100	8100	24300	
Coordinators round-table forum	11138	11138	11138	33413	
Total	134438	102038	102038	338513	25.9

Consortium Management					
	Year 1	Year 2	Year 3	Total	% of Total
Personnel (coordinator, Exec. Cttee, and admin support)	€	€	€	€	
Personnel (coordinator, Exec. Cttee, and admin support)	30000	30000	30000	90000	
Total	30000	30000	30000	90000	6.88

Summary					
	Year 1	Year 2	Year 3	Total	% of Total
Overall Total	€	€	€	€	
Overall Total	469688	425288	413288	1308263	100.0
20% overheads	93938	85058	82658	261653	
Subcontracts	10000	10000	10000	30000	
Final Total	573626	520345	505945	1599916	

9. Other Issues

Not applicable.

APPENDIX A - Consortium Description

A.1 Participants and Consortium

Fred Cummins, University College Dublin.

(<http://www.cs.ucd.ie/staff/fcummins>)

Dr. Cummins coordinates the Cognitive Science degree in University College Dublin and is the leader of the Adaptive Speech Interface group in Media Lab Europe. He holds a Ph.D. in Cognitive Science and Linguistics from Indiana University, for which he won the Cognitive Science Outstanding Dissertation award. He was also awarded the Mellon Postdoctoral Fellowship in the Department of Linguistics, Northwestern University. His research work addresses, among other things, temporal patterning in speech production and perception, motor control and the coordination of skilled action, dynamic modelling within cognitive science, biological and physiological influences on prosody, and cross-linguistic variation in prosodic structure. He has published over 48 papers and holds a patent on speaker identification.

Erik Hollnagel, Linköpings Universitet

(<http://www.ida.liu.se/~eriho/>)

Professor Hollnagel specializes in Human-Computer Interaction. He founded the discipline Cognitive Systems Engineering and is the Joint Editor-in-Chief of the International Journal of Cognition, Technology, & Work. He has worked in several institutes, including the Institute of Psychology, University of Aarhus, the Psychological Laboratory, University of Copenhagen, CRI in Copenhagen, European Institute of Engineering and Cognitive Science (EURISCO), France. He has held visiting research posts at the Japan Atomic Energy Research Institute, the University of Birmingham, the University of Manchester, Wright-Patterson Air Force Base, University of Kyoto, the National Maritime Research Institute (NMRI), Tokyo. He has edited or authored nine books on aspects of cognition, and has published over 32 book chapters, and over 45 journal papers.

Matthias Scheutz, University of Notre Dame

(<http://www.nd.edu/~mscheutz/>)

Prof. Scheutz is the Director of the Artificial Intelligence and Robotics Laboratory at the University of Notre Dame. He holds a Ph.D. in Cognitive Science and Computer Science from Indiana University Bloomington and a Ph.D. in Philosophy from the University of Vienna. His research in cognitive science includes cognitive modelling, in particular bilingualism and reference resolution. His work in AI spans agent architectures, affective control, agent-based modelling and simulation, behaviour-based robotics, believable and emotional agents, evolution of affect, multi-agent systems and cooperative behaviour, vision and robotics. He has also worked on the foundations of cognition and the

philosophy of AI, computation, and language. He has published over sixty papers in all of these areas.

Bill Sharpe, The Appliance Studio Ltd.

(<http://www.appliancestudio.com>)

Bill Sharpe is CEO and co-founder of The Appliance Studio, a research and innovation company specialising in the impact of pervasive digital technology on everyday products and services. He has a degree in Experimental Psychology and a Masters in Computer Science and has specialised in the human centred understanding of technology. Bill undertakes strategic technology consulting for commercial and public sector clients, bringing fundamental user understanding together with strategic tools for the management of innovation. Recent projects have included leading long-term technology impact analyses for the UK Foresight programmes in Cognitive Systems and Cybertrust & Crime Prevention. He is a visiting fellow at Bristol University with whom he was a co-founder of a collaborative research programme exploring the interaction between located digital media and physical space (www.mobilebristol.com). Bill was previously a research lab Director at Hewlett-Packard's corporate labs in Bristol, UK, where he pioneered new concepts in pervasive computing.

David Vernon, Università degli studi di Genova.

(<http://www.dvernon.net>)

David Vernon is a member of the management team of the RobotCub cognitive systems integrated project (www.robotcub.org), with particular responsibility for the cognitive neuroscience area, and a Visiting Professor at the University of Genova. He was also the Coordinator of the ECVision network for cognitive vision systems (www.ecvision.org). He has more than 25 years experience in industry (Westinghouse Electric), academia (Trinity College Dublin, National University of Ireland, Etisalat University College, University of Genova), and public bodies (the European Commission, Science Foundation Ireland). He has coordinated several research projects and information systems projects (one, in Trinity College, involving 135 people). He organized and chaired the Sixth European Conference on Computer Vision (ECCV 2000) in Dublin. He has authored two and edited three books on computer vision and has published over eighty papers in the fields of Computer Vision, Robotics, and Cognitive Systems.

Markus Vincze, Technische Universitaet Wien

(<http://www.acin.tuwien.ac.at/acin/people.asp?id=4> and <http://www.acin.tuwien.ac.at/>)

Dr. Vincze is the coordinator of the cognitive vision systems project *ActIPret – Activity Interpretation*. He received the PhD in 1993 from Vienna University of Technology in Robotics. With a grant from the Austrian Academy of Sciences he spent post-doc years at HelpMate Robotics Inc., with J.E. Engelberger, and at the Yale University with Prof. G.D. Hager working on robust real-time tracking

methods. Since 1995 he is leading the Sensors for Robotics Group at TUW. Presently, he coordinates and is key scientist of the Austrian Research Cluster on 'Cognitive Vision – a Key Technology for Personal Assistance'. He was also the co-ordinator of the RobVision project. Dr. Vincze serves as reviewer for the EU, the German research fund, journals such as IEEE Transactions on Robotics and Automation, IJRR, FAIM, several conferences including IEEE ICRA, IROS, and SIRS. He published 45 papers in refereed journals and conferences in the area of vision and together with G.D. Hager he edited a book on "Robust Vision for Vision-based Control of Motion". He co-organized and chaired the third International Conference on Vision Systems (ICVS 2003) in Graz.

Christoph von der Malsburg, Ruhr-Universitaet Bochum

(<http://www.neuroinformatik.ruhr-uni-bochum.de/ini/VDM/top.html>)

Professor von der Malsburg holds the Chair of System Biophysics at Ruhr-Universität Bochum and he is the joint-head of the Institut für Neuroinformatik. He also heads the Laboratory for Computational and Biological Vision at the University of Southern California in Los Angeles. His research activities span growing self-organization neural networks, biologically-motivated models (networks of cortical columns, dynamic link matching, fast synaptic plasticity, flexible sensor fusion, and segmentation with neural oscillators), robotics (hand-eye coordination and human-robot interaction), and computer vision (image processing, model representation by labeled graphs, elastic graph matching, and segmentation). He has published extensively in all these areas with over 300 papers since 1973.

Tom Ziemke, Högskolan i Skövde

(www.his.se/ziet)

Prof. Ziemke is a full professor of cognitive science in the School of Humanities and Informatics at the University of Skövde. He holds a German diploma degree in business informatics, a Swedish masters degree in computer science, and a PhD degree from the University of Sheffield. Much of his research in recent years has been concerned with embodied and distributed cognition, in particular theories and neuro-robotic models of how the body and its sensorimotor interaction with the environment shape cognitive processes and social interactions. He is editor of the Connection Science journal and associate editor of the journal New Ideas in Psychology. From January 2006 he is coordinator of an EC-funded four-year Cognitive Systems project called "Integrating Cognition, Emotion and Autonomy" (ICEA).

Guy Tiberghien, Centre National de la Recherche Scientifique

(<http://www.isc.cnrs.fr/tib/tibtiberghien.htm>)

Guy Tiberghien is Professor at the Institute of Cognitive Science at the Lyon University. He is member of the Institut Universitaire de France. He also has been Professor at the Grenoble University where

he was Head of the Department of Psychology and Experimental Psychology Laboratory. He was Associate Professor at the Geneva University. He also held a Carnegie fellowship in Aberdeen University. He holds a Ph.D. in Psychology and a Sc.D. in Human Sciences from Paris University. His research in cognitive psychology and cognitive science include cognitive modelling, in particular human memory and face recognition. He has edited or authored sixteen books on different aspects of memory, cognition and cognitive science, and has published sixty four journal papers.

Peter F. Dominey, Centre National de la Recherche Scientifique

(<http://www.isc.cnrs.fr/dom/dommenu-en.htm#peter>)

Peter Ford Dominey completed the BA at Cornell University, Ithaca NY in 1984 in the College Scholar Program, in the fields of cognitive psychology and artificial intelligence. In 1989 and 1993 respectively he obtained the M.Sc. and Ph.D. in computer science from the University of Southern California, Los Angeles CA, developing neural network models of sensorimotor sequence learning. From 1984 to 1986 he was a Software Engineer at The Data General Corporation in Westboro MA, and from 1986 to 1993 he was a Systems Engineer at the Jet Propulsion Laboratory in Pasadena CA. From 1993 to 1997 he was a post-doctoral fellow at the Vision and Motor Control laboratory of INSERM in Lyon France, and in 1997 he became a tenured researcher in the Centre National de la Recherche Scientifique (CNRS). He currently leads a research group on Sequential Cognition and Language at the Institut des Sciences Cognitives in Lyon France. His research interests include understanding and simulating the neurophysiology of cognitive sequence processing and language, and the application of this knowledge to humanoid robot cognition and language processing.

Juergen Jost, Max Planck Institute for Mathematics in the Sciences.

(<http://www.mis.mpg.de/jjost/interests.html>)

Prof. Jost is a Director and permanent member of the Max Planck Institute for Mathematics in the Sciences, Leipzig, and an Honorary Professor at Leipzig University. He is a full member of the German Academy of Natural Scientists, Leopoldina, and a Corresponding Member of the Saxon Academy of Sciences, Leipzig. He is also an external member of the Santa Fe Institute for the Sciences of Complexity in the USA and a Full Member of the Academy of Sciences and Literature, Mainz. His research interests include complex systems and cognitive structures, embracing the theory of dynamical systems, general systems theory, mathematical models of cognitive processes and neural networks, and conceptual and mathematical questions of biology.

Andreas K. Engel, University Medical Center Hamburg-Eppendorf

(<http://www.40hz.net/>)

Prof. Engel is a full professor of physiology and director of the Institute of Neurophysiology and Pathophysiology at the University Medical Center Hamburg-Eppendorf. Having worked as staff

scientist and research group leader at the Max Planck Institute for Brain Research (Frankfurt, Germany) between 1987 and 2000, A. Engel has developed a long-standing interest in the dynamics of distributed sensory representations, intermodal and sensorimotor integration, and in computational theories of perception and representation. In 2000, he moved to the Research Center Jülich (Jülich, Germany) to set up the newly established Cellular Neurobiology Group at the Institute for Medicine. In 2002, he was appointed to the Chair of Neurophysiology at the Medical School of the University of Hamburg (Germany). A. Engel's group has extensive experience with in-vivo multielectrode recording from humans, carnivores and rodents, as well as with EEG and MEG recordings in human subjects. The group is currently interested in comparative studies of neuronal synchronization between cortical and subcortical structures, in the role of synchrony for sensorimotor transformations, in functional links between synchrony and perceptual states, in cross-species comparisons of synchronization phenomena, and in the study of synchronization mechanisms. Furthermore, the group focuses on the pathophysiological relevance of synchronization phenomena and temporal dynamics. A. Engel has published over 100 papers on these topics.

A.2 Sub-contracting

Sub-contract to Second Additional Expertise on the Executive Committee

The spectrum of disciplines that need to be involved in any successful attempt to address the area of cognitive systems is exceptionally broad, ranging from the human sciences (neurophysiology, psychology, linguistics, cognitive science, and philosophy, for example) to the physical and theoretical sciences (artificial intelligence, computer science, autonomous systems theory, robotics, perceptual systems, and mathematical modelling, to name but a few). The Executive Committee comprises eleven members from the initial set of ten contractors. Although this group spans much of the spectrum of disciplines mentioned above, it can be strengthened further with the addition of expertise in philosophy and cognitive science. It is intended to offer a sub-contract to Prof. M. Scheutz, University of Notre Dame (see profile in the previous section) who possesses the exceptional qualifications of Ph.D.s in both Philosophy and Cognitive Science & Computer Science. This multidisciplinary expertise will be very valuable in complementing that of the existing Executive Committee and in bridging these important disciplines in the work of the Network. Furthermore, his base in the USA will provide euCognition with a useful way to enhance our Outreach activity in North America.

The value of the sub-contract will be approximately equal to the average budget allocated to each member of the Executive Committee. The sub-contract will respect all the rules set down in the Contract and expanded upon in the Guide to Financial Issues (see Commission Document No. s_2034005_20050316_104305_2034en.pdf at <http://www.cordis.lu/fp6/find-doc.htm>).

Sub-contracts for Network Actions

The standard FP6 contract poses some difficulties for the effective and efficient running of a network involving many members, most of whom incur relatively small costs, such as those who are involved only in attending meetings and undertaking small Network Actions. The magnitude of these incurred costs is often likely to be comparable to the cost of procuring the mandatory audit certificate. The matter is further complicated by the fact that no more than 7% of the total budget can be spent on management (which includes the audit certificate costs). If every member was a contractor then the total cost of the audit certificates would quickly rise beyond this limit (and there would be nothing left for the actual management).

To overcome these problems, the Network Action labour costs of members who are *not* contractors will be reimbursed through sub-contracts. Travel and other costs will be reimbursed directly to the member in the manner detailed in Section 6.1 *Project Management*, Sub-section *Reimbursement of Costs*.

The sub-contract will respect all the rules set down in the Contract and expanded upon in the Commissions “Guide of Financial Issues”, Sections 5: *Subcontracts* and 2.2.1.1: *The particular case of subcontracting* (see Commission Document No. s_2034005_20050316_104305_2034en.pdf at <http://www.cordis.lu/fp6/find-doc.htm>). These guidelines state:

“Contractors are free to subcontract minor tasks that have not been identified as subcontracts in the technical annex but with the additional obligation to justify the necessity of those subcontracts, and their compliance with the contractual provisions, at the relevant periodic justification ... [and] ...Any subcontract, the costs of which will be claimed under the project, must be offered to the best bid *in compliance with the national legislation of the contractor concerned*. [emphasis added] A public legal entity must apply its internal rules for selection of service – providers (public call for tender) and a private legal entity must at least require submission of several quotes (usually a minimum of three), unless it has an established framework contract for the provision of those services.”

Since the Coordinating Contract will in all cases be responsible for the issue of sub-contracts, Italian national legislation is effective and it does not require an open call in certain circumstances, specifically when

- the value of the subcontract is small;
- the subcontract is for a unique service;
- the subcontract is awarded by a committee;

- the subcontracting process is described in the Technical Annex to the Contract under which the sub-contract is awarded.

All of these conditions are met by Network Actions: the award of a Network Action, and hence a sub-contract, is made by a decision of the Executive Committee and is subject to the approval of the Commission Project Officer; see Section 6.1 *Project Management*, Sub-section *Funding of Network Actions*. This award by committee after review of both technical and financial aspects of the Network Action and subsequent approval of the Commission satisfies the requirements of Italian legislation and also effectively ensures that the contractor (*i.e.* the Coordinating Contractor) has respected conditions of transparency and equal treatment in selecting a subcontractor, as well as obtaining the best price-quality ratio.

A template sub-contract will be provided in the Consortium Agreement. Apart from providing for the specification of the work to be done, it will explicitly state the responsibilities of both contractor and sub-contractor as set out in the Contract and the Guide to Financial Issues, as follows:

"the contractor shall retain sole responsibility for carrying out the action and for compliance with the provisions of the agreement. The contractor must undertake to make the necessary arrangements to ensure that the subcontractor waives all rights in respect of the Commission under the contract ... [and] ...the contractor must undertake to ensure that the conditions applicable to it under Articles II.9, II.10, II.11, II.12, II.28.8 and II.29 of the contract are also applicable to the subcontractor."

Furthermore, it will make explicit the following provision:

"Since a sub-contract relates to the production of a service, it should be clear that any intellectual property resulting from any subcontracted work belongs to the contractor and must be at the entire disposal of the contractor." [Section 2.2.1.1].

A.3 Third parties

The policy of the consortium toward the inclusion of new parties is identically that of admission to membership of euCognition and is described in detail in Section 6.1 *Project Management*, Sub-section *Admission of Members*.

A.4 Funding of third country participants

The policy of euCognition is to be as open as possible. This extends equally to the admission of members from outside the EU. Funding of such members will be effected in line with the rules set out in the Commissions “Guide to Financial Issues” (s_2034005_20050316_104305_2034en.pdf).