PROJECT PERIODIC REPORT

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Project acronym: ARTISTDESIGN

Project title: ArtistDesign – Design for Embedded Systems

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Periodic report: 1st ☐   2nd ☐   3rd ☒   4th ☐

Period covered: from   1st January 2010 to 31st December 2010

Name, title and organisation of the scientific representative of the project's coordinator[1]:

Joseph SIFAKIS – UJF VERIMAG (partner n°2)

Tel: +33 4 56 52 03 51

Fax: +33 4 56 52 03 50

E-mail: Joseph.Sifakis@imag.fr

Project website[2] address: http://www.artist-embedded.org/

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1. Declaration by the scientific coordinator

Declaration by the scientific representative of the project coordinator[1]

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;

- The project (tick as appropriate):

  - ☒ has fully achieved its objectives and technical goals for the period;

  - ☐ has achieved most of its objectives and technical goals for the period with relatively minor deviations[3];

  - ☐ has failed to achieve critical objectives and/or is not at all on schedule[4].

- The public website is up to date, if applicable.

- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 6) and if applicable with the certificate on financial statement.

- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 5 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator : ......JOSEPH SIFAKH......

Date: 2 / 2 / 11

Signature of scientific representative of the Coordinator[1]: ....

[!] If either of these boxes is ticked, the report should reflect these and any remedial actions taken.

[4] If either of these boxes is ticked, the report should reflect these and any remedial actions taken.

2. Publishable summary

1. Overview

ArtistDesign is a driving force for federating the European research community in Embedded Systems Design. It brings together 31 of the best research teams as core partners, 15 Industrial and SME affiliated Industrial partners, 25 affiliated Academic partners, and 5 affiliated International Collaboration partners who participate actively in the technical meetings and events.

The central objective for the ArtistDesign European Network of Excellence on Embedded Systems Design is to build on existing structures and links forged in the FP6 Artist2 NoE, to become a virtual Center of Excellence in Embedded Systems Design. This is mainly achieved through tight integration between the central players of the European research community. These teams have already established a long-term vision for embedded systems in Europe, which advances the emergence of Embedded Systems as a mature discipline.

The research effort aims to integrate topics, teams, and competencies, through an ambitious and coherent research programme of research activities which are grouped into 4 Thematic Clusters: "Modelling and Validation", "Software Synthesis, Code Generation, and Timing Analysis", "Operating Systems and Networks", "Platforms and MPSoC". "Transversal Integration" covering both industrial applications and design issues aims for integration between clusters.

The NoE has a very dynamic International Collaboration programme, interacting at top levels with the best research centers and industrial partners in the USA: (NSF, NASA, SRI, Boeing, Honeywell, Windriver, Carnegie Mellon, Vanderbilt, Berkeley, UPenn, UNC Chapel Hill, UIUC, etc) and in Asia (Tsinghua University, Chinese Academy of Sciences, Seoul National University, East China Normal University, etc).

ArtistDesign also has a very strong tradition of Summer Schools and Graduate Schools (http://www.artist-embedded.org/artist/-Schools-.html), and major workshops (http://www.artist-embedded.org/artist/-Workshops-and-Seminars,29-.html).

ArtistDesign builds on existing international visibility and recognition, to play a leading role in structuring the area.

The Scientific Coordinator for the ArtistDesign European Network of Excellence is Joseph Sifakis (VERIMAG Laboratory). The Technical Coordinator is Bruno Bouyssounouse (VERIMAG Laboratory).

2. Joint Programme of Research Activities (JPRA)

The ArtistDesign NoE implements a Joint Programme of Activities, composed of:

- **Joint Programme of Integration Activities (JPIA)**
  including joint technical meetings, staff mobility and exchanges, sharing research tools and platforms, and an intranet-based communication structure.
  These activities promote horizontal integration of geographically dispersed teams – each excellent in one or more topics -, and vertical and trans-disciplinary integration of traditionally separated topics. All these activities will have long-lasting effects, well beyond the duration of the initial EC funding.

- **Joint Programme of Research Activities (JPRA)**
  promote excellence and integration via either the Thematic Cluster activities, or the Transversal Integration activites.
  Integration may These activities are expected to move the state of the art forward, and have a real impact on work done in other teams, for both research and development.

- **Joint Programme of Activities for Spreading Excellence (JPASE)**
  allow excellence to spread from the JPRA and JPIA activities, to the larger embedded systems community.
  These usually take the form of workshops, schools, seminars, and publications (books, course materials, etc). Spreading excellence activities also allow the Artist2 partners to gain useful contacts and information from outside the NoE.

- **Joint Programme of Management Activities (JPMA)**
  plan, organize, direct and monitor the integrated effort to efficiently achieve the technical objectives within the ArtistDesign constraints of time schedule and budget.
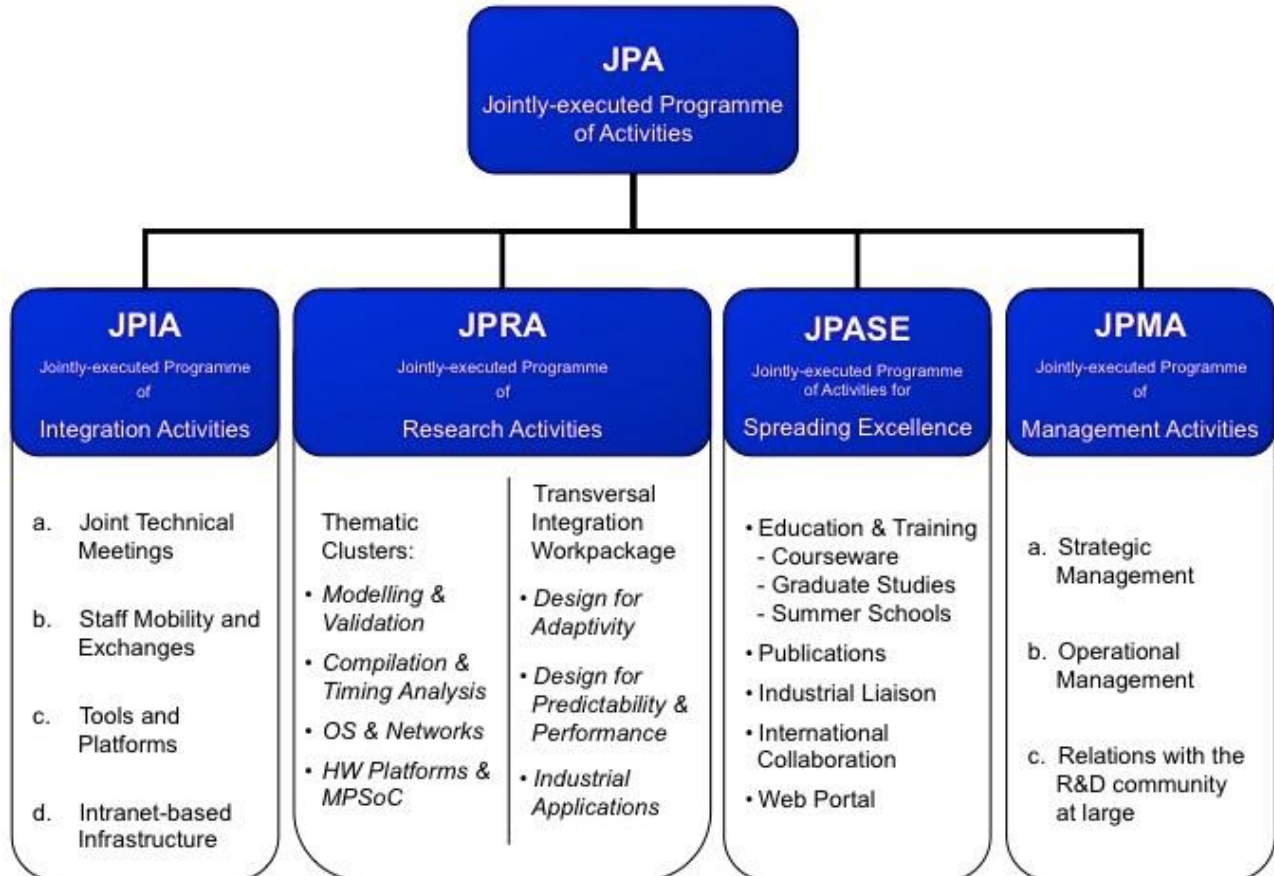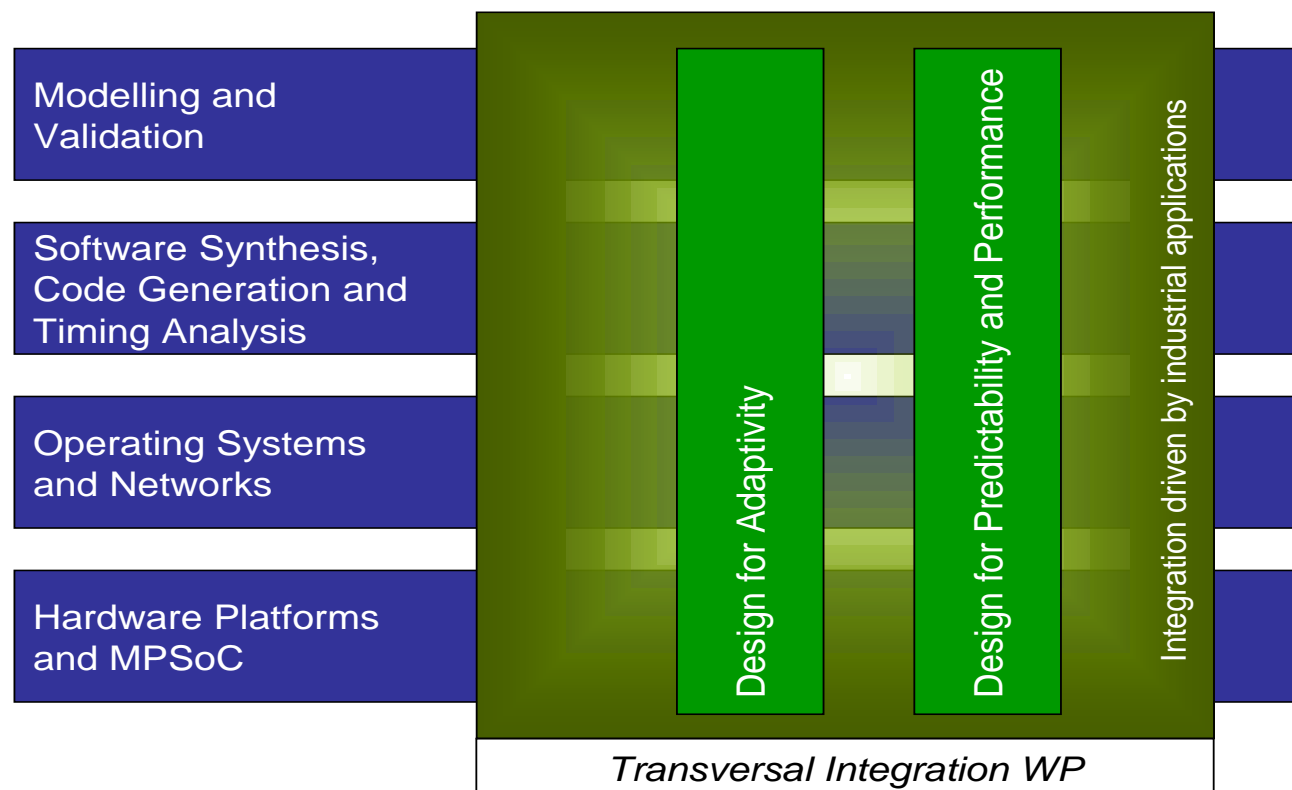
The JPRA is composed of intra and inter-cluster research activities on cutting-edge topics in embedded systems design. While the main bulk of financing for these activities is taken up by outside programmes (Integrated Projects, National Programmes, Industrial Contracts, etc), the ArtistDesign NoE finances the extra burden due derived from integrating these into a single coherent research programme.

Thus, the essential ingredient within ArtistDesign is the JPRA, which motivates the participating research teams far more than the actual financing, which is tiny in comparison with the overall research aims. It is completed by the Joint Programme of Integrating Activities (JPIA), and the Joint Programme of Activities for Spreading Excellence (JPASE), and overseen by the Joint Programme of Management Activities (JPMA).

The structure of the research activities reflects the following decomposition of the embedded systems design flow.

This design flow is composed of the following cooperating activities, starting with component based modeling and leading to implementation. These activities must be well coordinated, and supported by tools and methods to ensure satisfactory levels of productivity and quality.

Accordingly, we have structured the area of embedded systems design into the following topics.

Modelling and Validation

Software Synthesis, Code Generation and Timing Analysis

Operating Systems and Networks

Hardware Platforms and MPSoC

Design for Adaptivity

Design for Predictability and Performance

Integration driven by industrial applications

Transversal Integration WP

Modeling and Validation. Unlike other computer systems, embedded systems are strongly connected with a physical environment. A scientific foundation for embedded systems must therefore deal simultaneously with software, hardware resources, and the physical environment, in a quantitative manner. In order to gain independence from a particular target platform, embedded system design must be model-based. In order to scale to complex applications, embedded system design must be component-based. The overall objective of this activity is develop model and component based theories, methods, and tools that establish a coherent family of design flows spanning the areas of computer science, control, and hardware. The activity brings together the most important teams in the area of model and component based design in Europe.

<u>SW Synthesis, Code Generation and Timing Analysis</u>. There is a continuing demand for higher performance of information processing, which stimulates using a growing amount of parallelism (including using multiple processors). This trend affects the design of embedded systems. We address issues related to multiple heterogeneous processors on a chip, also containing memory hierarchies and communication interfaces. Such processors can only be exploited if (sets of) applications can be efficiently mapped to heterogeneous processors.

Timing analysis is also affected by the trend toward the new platforms. Timing analysis has to cope with the kind of memory hierarchies found in MPSoCs. Also, timing analysis beyond the single processor is required. Hence, timing analysis will also consider the timing of communication. The overall objective is to provide safe timing guarantees for systems consisting of local memories hierarchies and multiple processors.

<u>Operating Systems and Networks</u>. We investigate how current real-time operating systems have to be extended or modified to support emerging real-time embedded systems characterized by a high degree of complexity, highly variable resource requirements and parallel processing such as multicores. Most embedded systems are often characterized by scarce resources in terms of processing power, memory, space, weight, energy, and cost.

Hence, another objective is to investigate kernel mechanisms that can efficiently manage the available resources, taking multiple constraints into account, whilst guaranteeing isolation properties. Also, to support dynamic applications with variable resource requirements or to cope with unpredictable resource availability, feedback control techniques for resource management at the operating system and application level are also investigated.

<u>Hardware Platforms and MPSoC Design</u>. While hardware platforms for embedded applications will continue to be multi-core, with increasing degrees of parallelism, the evolution trajectory on programming models, design-time and run-time application environments is much less clear. The consequence is fragmentation: while many research teams are working on one or more of these domains, there is little communication and integration, this leads to duplication of results and overall slow progress. The teams involved in this activity have a wide-ranging research experience which covers all the key areas in MPSoC application specification mapping. The integration activity supported by ArtistDesign will help the participants to the cluster in strengthening the coherency of their approaches and focus on addressing complementary issues in a synergistic fashion.

<u>Design for Adaptivity</u>. An embedded hardware-software system is adaptive, if it can modify its behavior and/or architecture to changing requirements. Adaptivity is increasingly important as the complexity and autonomy of embedded systems increases. Adaptivity is a cross-cutting system characteristic that affects both hardware and software. At the software-level adaptivity is mainly concerned with flexible and adaptive resource scheduling, e.g., CPU time scheduling. At the hardware-level adaptivity includes both adaptation of operation modes, e.g., supply voltage and clock frequency, processor instruction sets, and dynamic management of hardware resources, e.g., processing elements and memory.

<u>Design for Predictability and Performance</u>. Many applications have strict requirements on timing, and limited resources (memory, processing power, power consumption, etc.). All systems also have increasing demands on (average) performance, which has motivated the introduction of features such as caching, pipelining, and (now becoming very prominent) multiprocessor platforms. Almost all such efficiency-increasing features drastically increase variability and decrease analyzability of response-times, etc. and thus have a detrimental effect on predictability. Since the introduction of new architectural features is inevitable, it is important to: a) develop technology and design techniques for achieving predictability of systems built on modern platforms, and b) investigate the trade-offs between performance and predictability.

<u>Integration Driven by Industrial Applications</u>. To have a strong impact on industry and society at large, the results of the Thematic Clusters need to be harmonized in an overall design flow that can sustain the embedded design chain from conception of the product to its implementation. The design

chains vary in length and players according to the industrial segment addressed: for example, the design chain in automotive electronics starts with the car maker (e.g., BMW, Daimler Chrysler, Peugeot, Fiat), goes through the Tier 1 suppliers (e.g.,Contiteves, Bosch, Magneti Marelli) and connects to the Tier 2 suppliers (e.g., FreeScale, ST, Infineon, Hitachi). It often includes IP providers such as programmable cores, RTOS and software development tool providers and design service companies. In the mobile communication domain, the chain starts with the application developers (e.g., gaming and video content), includes the telecommunication operators (e.g., Telecom Italia and Telefonica), the device makers (e.g., Nokia and Ericsson), the silicon makers (e.g., TI, Qualcomm and ST) and outsourcing manufacturing companies (e.g., Flextronics). Today, there is stress in the chain as the technology advances may create opportunities to redefine the roles of the various players. In addition, the system integrators are often faced with an almost impossible task of composing their design out of parts supplied by companies whose design methods and standards are widely different and about which they have limited or no information. There is a need for an all-encompassing approach to system design that can make an entire industrial segment work as a virtual vertically integrated company.

3. Joint Programme of Integration Activities (JPIA)

The JPIA activities promote integration of geographically dispersed team sand have long lasting effects:

Joint Technical Meetings. Joint Technical meetings aim to present, discuss and integrate the ongoing work, and exchange points of view with other teams. They also serve to identify future work directions.

Staff Mobility and Exchanges. This is essential for integration within the NoE, including mobility of students and/or researchers, between core teams, or between core teams and affiliated teams. Mobility is justified by and refers to involvement in an activity from the JPRA or JPIA, or one of the following: co-funded scholarships with industry; exchange of students and personnel within the consortium.

Tools and Platforms. A research platform is composed of competencies, resources, and tools targeting specific technical and scientific objectives around a chosen topic. These are at the state-of-the-art, and are made available to the R&D community for experimentation, demonstration, evaluation, and teaching.

The research platforms, tools and facilities are an essential tool for implementing the JPIA. They will lay the groundwork for the JPRA, allowing common research to occur and capitalization on research results. Platforms are used as the basis for transfer of research results to industry. They allow teaching practical knowledge of the concepts and techniques.

ArtistDesign platforms are not defined from scratch – they integrate the results of long-term efforts, and are meant to be durable, evolving with the state of the art. The partners are committed to durability, and have invested significant resources into their development. The construction of ArtistDesign has provided the opportunity to assemble existing pieces into a rationally-structured set of platforms, covering the area of embedded systems design.

Some of the ArtistDesign platforms have international visibility, and the ambition is for these to serve as world-wide references in their respective topics.

4. Jointly-executed Programme of Activities for Spreading Excellence (JPASE)

ArtistDesign is progressively creating a European embedded systems design community and spreading the "Artist culture" in all major research institutions.

To ensure that the next generation of researchers will continue in this direction we, as a consortium, devote a great deal of effort to Spreading Excellence, in both academic and industrial circles. Furthermore, through our links with both core and affiliated partners, we actively set up permanent links between industry and public research, based on existing partner collaborations with major industrial players in the area.

The JPASE activities are intended to spread excellence and structure the community at large. They are planned by the Strategic Management Board, and are implemented by ArtistDesign core and affiliated partners.

The NoE will leverage on its members and teams, who play a main role in the organization of world-class scientific events, to disseminate results in the area. We expect that the NoE's structured and authoritative dissemination will have a strong effect on the community as a whole, for orienting and creating synergy for research.

5. Managing the Network of Excellence (JPMA)

We believe that the current two-tiered Management structure - dividing the management amongst cluster leaders and the Strategic Management Board composed of both cluster leaders and a limited number of other selected prominent core partners – has been the right one for managing such a large research entity. It has provided the right combination of flexibility and accountability, while leaving room for innovation and evolution.

This management structure is reproduced with adaptations in the ArtistDesign NoE. The adaptations reflect the greater cohesion between partners, and move to capitalize on and strengthen the integration achieved in Artist2.

3. Project objectives for the period

The ArtistDesign NoE is the visible result of the ongoing integration of a community.

The central objective for ArtistDesign is to build on existing structures and link, to become a virtual Centre of Excellence in Embedded Systems Design. This is achieved through tight integration between the central players of the European research community. Also, the consortium is smaller, and integrates several new partners. These teams have already established a long-term vision for embedded systems in Europe, which advances the emergence of Embedded Systems as a mature discipline.

ArtistDesign is becoming the main focal point for dissemination in Embedded Systems Design, leveraging on well-established infrastructure and links. It will extend its dissemination activities, including Education and Training, Industrial Applications, as well as International Collaboration. ArtistDesign will establish durable relationships with industry and SMEs in the area.

ArtistDesign builds on existing international visibility and recognition, to play a leading role in structuring the area.

The research effort aims to integrate topics, teams, and competencies, grouped into 4 Thematic Clusters: "Modeling and Validation", "Software Synthesis, Code Generation, and Timing Analysis", "Operating Systems and Networks", "Platforms and MPSoC". "Transversal Integration" covering both industrial applications and design issues aims for integration between clusters.

4. Work progress and achievements during the period

4.1 Modeling and Validation (Cluster)

Both research activities with the cluster – the *Modeling Activity* and the *Validation Activity* – have progressed substantially within the third year, and with significant synergy between proposed modeling formalisms and methods and validation techniques they support:

Within the sub-activity *Component Modeling* and *Compositional Validation* several partners have worked substantially and collaboratively on compositional design and verification methodologies for functional, timing and stochastic aspect. The results include

- Assume/guarantee reasoning, interface automata as well as modal transition systems for rich models.

- Theoretical foundations and coordination languages have been developed for heterogeneous systems.

- A framework for tool integration based on meta-models and model-transformations.

The work in the sub-activity *Resource Modeling (*of the *Modeling Activity)* includes:

- design space exploration,

- multi-core scheduling,

- modelling paradigms for quantitative resources

- platform models including transactional memory.

The work in the sub-activity *Quantitative Modeling (*of the *Modeling Activity)* has produced significant results on:

- design frameworks for quantitative modeling, in particular weighted automata, priced timed automata and quantitative communication models.

- synthesis of models guaranteeing quantitative properties.

Within the sub-activity *Quantitative Validation* substantial work has been made on improved schedulability analyses supporting multiprocessor and multi-core applications. The work:

- takes into account scheduler overhead for power-awareness – i.e. exploiting slacks in the system of processes to reduce power consumption while insuring deadlines are met.

- combines abstract interpretation and model-checking for timing and interference analysis of parallel programs on multi-core,

- has been applied for schedulability analysis of Safety Critical Java applications.

Within the sub-activity *Cross-Layer Validation* substantial work has been made on improved methods for model-based testing including:

- incremental testing of composite systems,

- off-line test generation from timed automata models,

- model-based test generation for data-intensive systems, as well as runtime monitoring.

4.2 Software Synthesis, Code Generation and Timing Analysis (Cluster)

In year 3, we have seen a proliferation of the basic techniques studied by this cluster. The importance of using multi-processor systems has been growing even more than it did in year 2.

Several tools for mapping of applications to MPSoCs have become available (e.g. from RWTH Aachen, IMEC, Erlangen-Nuremberg and Seoul National University). We have reached a situation where such tools can be considered state of the art. We expect such tools to leave the research labs in the not too distant future.

Within the cluster, timing analysis and timing predictability for multicore platforms have seen substantial progress. The results include

- the worst-case execution time aware compiler WCC (Dortmund, AbsInt, USAAR)

- cache-aware scheduling (USAAR, SSSA). Contacts with the MPSoC design cluster have been strengthened.

- timing analysis of multicore systems with shared caches, and to bound the context switch penalty due to cache effects in preemptive systems

- analysis on micro-architectural level has progressed, especially regarding cache replacement policies and pipeline behaviour.

- automated derivation of timing models from VHDL specifications.

- generation of timing models from observations, based on machine learning and model identification.

Concerning the goal of reconciling timing analysis with compilation, the WCET-aware compiler WCC developed at TU Dortmund has been extended beyond the initial TriCore hardware platform and toward multi-objective optimization. Collaboration between TU Dortmund, AbsInt and the ArtistDesign Cluster on Operating Systems and Networks has been strengthened. We established a new link between reliability, compilers, operating systems and real-time systems.

Finally, dissemination comprises the inclusion of educational material on software synthesis, compilers and timing analysis in the second edition of the textbook on embedded systems by P. Marwedel.

4.3 Operating Systems and Networks (Cluster)

The fruitful collaboration among the cluster participants is demonstrated by the number of joint publications, projects and events organized within the cluster. The main examples are the organized workshops and conferences, graduate courses, and the various research consortia that have led to new European projects, like ACTORS, PREDATOR, IRMOS, and SOOS.

All research activities in the cluster have progressed substantially within the third year. The following list briefly summarizes some of the major achievements for year 3. Details and more information can be found in the three activity reports by the cluster.

- **UNIBO-PISA** continued to collaborate on predictability and modularity of MPSoC for Real-Time applications. The interaction has been realized by the integrating tools developed by the partners: the Erika RTOS from SSSA has been extensively used on the MPARM platform developed by UNIBO.

- **USAAR, PISA, Dortmund, AbsInt**. Also supported be the PREDATOR project, these partners collaborated to improve the estimation of worst-case execution times considering cache-aware scheduling and WCET-aware compilers.

- **EVIDENCE-PISA**. A great effort has been done to introduce resource reservation and deadline-based scheduling (EDF) in the Linux operating system, so enabling the implementation of advanced resource reservations techniques.

- **LUND-TUKL-PISA**. Also supported by the ACTORS project, these partners collaborated to develop a design framework for partitioning real-time applications on multicore heterogeneous systems, with the objective of guaranteeing optimal usage of the available resources.

- **PISA-UPC** tightly worked together to define a laboratory platform and experiment to be integrated in the education of embedded control system engineers. The experiment consists in the control of a dynamical system on a platform supported by the Erika real-time kernel. The set up has been tested on a graduate course jointly organized in Pisa on June 14-18, 2010.

- **ULUND-PISA** continued to collaborate on event-based control systems. In this third year, the work has focused on network scheduling of event-based controllers.

- **Aveiro, UnivPorto and Malardalen** worked on a reconfigurable hierarchical scheduling framework within an enhanced Ethernet switch that allows an efficient use of bandwidth, enforcing temporal and spatial isolation.

- **York, Cantabria, Porto, Madrid, Valencia** collaborated for providing a language support for programming schedulable systems. This year the work has focused on getting support for multiprocessors into the next versions of Ada and the Real-Time Specification for Java. These have now effectively been agreed and will enter into the standards at their next releases.

- **TUKL, CSEM, Philips, Pisa, York, Porto, Prague**. Contributed on the development of timeliness in Wireless Sensor Networks. The teams at TUKL, CSEM and Philips proposed a generalized notion of timeliness, which suits the characteristics of WSN, based on the requirements in the EU IST project WASP.

- **Mallorca, UnivPorto, Catalonia, IFP** addresses the problem of robustness and timeliness in Controller Area Networks.

- **Cantabria, Madrid: UPM and UC3M, Bilbao, UnivPorto** collaborated for providing real-time support to middleware and composability. A set of timing analysis tools has been integrated with a toolset for MDE. In addition, a new approach has been explored to integrate

the real-time end-to-end flow model with the automatic generation of Ravenscar-compliant source code in distribution middleware.

- **ALL PARTNERS** contributed to a major activity (coordinated by YORK) for building taxonomy of resources, considering multi-resource platforms and including the use of banded notions of time and hierarchical structures.

- **Madrid, Pisa, Aveiro, UnivPorto, Malardalen, NXP, TUKL** worked on protocol optimizations for embedded real-time communications. The validation showed performance improvements in comparison to currently used infrastructures. The performance has been reported to a journal in an article which now in accepted status.

- **Catania, Pisa, Evidence** have been involved in intelligent transportation systems, automatic traffic monitoring and road surveillance. Various sensors have been used to estimate traffic parameters. Catania proposed a wireless sensor network architecture based on computer vision techniques for automatic scene analysis and interpretation.

4.4 Hardware Platform and MPSoC Design (Cluster)

The activities on Platform and MPSoC Design and Platform and MPSoC Analysis have been further integrated. The following is a list of some of the major achievements for year 3 showing collaboration between teams of the Cluster and other teams of the NoE. Details and more information can be found in the two activity reports by the cluster, one on design and one on analysis.

- EPFL-UNIBO: Interaction between EPFL and UNIBO was very active in Year 3. Major problems tackled include: 1) Network on Chips models and tools; 2) 3D integration models and analysis tools; 3) Study of NoCs for 3D integration. Exchanges with University of Bologna (UNIBO) continued from the previos years. Prof. Benini spent 2 months at EPFL as Visiting Professor.

- UNIBO-SSSA: UNIBO continued to collaborate with the Scuola Superiore Sant'Anna (SSSA) on predictability and modularity of MPSoC for Real-Time applications. The interaction has been realized by the integrating tools deveoped by the partners: the Erika RTOS from SSSA has been extensively used on the MPARM platform developed by UNIBO.

- ETHZ-TUBS: There has been intense cooperation about the coupling of two performance analysis methods, namely Symta/S and MPA. The corresponding tools have been connected and joint works on hierarchical event streams have been published.

- ETHZ-VERIMAG: The system for mapping algorithms onto MPSoC platforms (DOL) has been connected to the BIP system of Verimag with the advantage of a provably correct design flwo as well as a fast performance evaluation method that supports design space exploration.

- ETHZ-UNIBO: Based on a successful cooperation in terms of energy harvesting sensor networks, several further joint investigations of application control and hardware implementation have been performed, related to the area of CPS. Major extensions have been done in terms of harvesting in distributed settings and reward-based optimization strategies. These activities resulted now in a journal publication.

- TU Braunschweig-ETHZ: Interaction between TU Braunschweig and ETHZ has been in the area of performance analysis for multiprocessor systems with shared resources. Opportunities for improvement of modelling and analysis approaches were identified.

- KTH-ETHZ: Zhonghai Lu from KTH has visited ETHZ in the period November 2009-January 2010. The visit focused on performance analysis of embedded systems, on-chip communication and wireless sensor networks and has increased the mutual understanding of the two groups research efforts in this area. It generated several ideas for focused joint research topics.

- DTU-KTH: The two groups have a tight cooperation on the topic of system level modelling, which is also part of the SYSMODEL Artemis project. The KTH modelling framework ForSyDe is used as common basis for further developing system level modelling techniques. DTU has develop the discrete time modelling domain of ForSyDe further, allowing for faster simulation as well as for parallelization of the simulation kernel, which is a key element when modelling wireless sensor networks (CPS). KTH has focused on synchronous, the untimed and continuous time domain. Mikkel Koefoed Jakobsen from DTU has visited KTH twice during 2010 for periods of several weeks to a few months to foster the joint work on the ForSyDe framework. One of the new demonstrators for this work, is a medical audio-device for adjusting hearing aids.

- CEA LIST and UNIBO have continued their collaboration for the definition and design of a Software Runtime Architecture for the management of many-core components. They also work on the design of efficient hardware support for the execution of this runtime software. This runtime SW is distributed to other prtner within the framework of SMECY project. A joint publication has been submitted on part of this collaboration.

- LINKÖPING-DTU: Linköping and DTU have continued their work on fault tolerant embedded systems. This has resulted in joint development and publications. Prof. Paul Pop from DTU has visited Linköping.

- LINKÖPING-LUND: Linköping has a close cooperation with Lund (Artist design partner Cluster: Operating Systems and Networks) in the area of modelling and QoS optimisation of control applications. This has resulted in joint development and publications. Soheil Samii and Anton cervin have visited Lund and Linköping, respectively.

- IMEC-NTUA: IMEC and NTUA have been collaborating on several MPSoC topics including a framework for automatic parallelization, static and dynamic memory optimization in MPSoC platforms, runtime system exploration for multi-standard Wireless MPSoC.

- IMEC-KTH: IMEC and KTH continued their collaboration in the context of the European project MOSART (http://www.mosart-project.org). The Co-Ware virtual multi-core platform developed by IMEC was transferred to KTH for integration of the NoC architecture in the platform model.

- IMEC-NTNU: there has been cooperation on data value driven scenario identification and reuse of epilepsy detection kernel as additional biomedical demonstrator for scenario related research.

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4.5 Design for Adaptivity (Transversal Integration activity)

The partners have organized several workshops and meetings, including WARM 2010. The meetings act as the interface between the different clusters on issues related to embedded system adaptivity.

The partners have contributed to education about adaptive and feedback-based approaches. There are also several contacts between industry and academia within the activity, e.g., collaborations involving NXP, Ericsson, Volvo, IMEC, and Evidence just to name a few.

A major challenge for this activity continuous to be how to integrate the more hardware-oriented partners from, e.g., the MPSoC cluster with the more software-oriented partners from the OS and networks cluster. Currently the activity is dominated by partners from the latter cluster.

The members of the activity are organizing a special issue on Adaptive Embedded Systems for Real-Time Systems Journal with Årzén (ULUND) as guest editor. The deadline for submissions is Sep 2011 which fits quite nicely with the end of ArtistDesign, making it possible for the members of the activity to submit their work there.

We provide a list of technical achievements of the partners, both jointly and individually, during Year 3, structured in three groups: adaptive resource scheduling, adaptive networking, and hardware adaptation. In the first and largest group we also include work on modelling and analysis relevant to adaptation.

Adaptive Resource Scheduling

- Adaptive and feedback-based resource management (SSSA, ULUND, TUKL, Evidence, Ericsson)
- Adaptive resource management for uncertain execution platforms (ULUND, Ericsson)
- Feedback control of computing systems (ULUND)
- Theory of distributed performance analysis (TU Braunschweig)
- In-system sensitivity analysis for real-time systems (TU Braunschweig)
- Change impact analysis (UYork)
- Parametric WCET analysis (MDH)
- Runtime management of cache-related preemption delay (IPPorto)
- Fault tolerance in adaptive cooperative systems (IPPorto)
- Dynamic behavior of embedded systems (IMEC, NTUA)
- Adaptive control of MPEG-4 decoding (TUKL, ULUND)
- Improving real-time BIP (Verimag).
- Adaptation in service-oriented architectures (UPM)
- Adaptive servers with guarantees (ETH Zurich, SSSA)
- Adaptive power management (ETH Zurich, SSSA)
- Sampling mechanisms for event-driven control systems (UPC, ULUND, SSSA)
- Feedback scheduling vs. event-driven control (UPC)
- Optimal online sampling period assignment (ULUND, UPC)

Adaptive Networking

- Adaptivity in wireless networks (UPorto, UCatania)

- Adaptivity in distributed systems (UPorto, MDH, UAveiro, UPC)

- Adaptive management in energy harvesting systems (ETH Zurich, UBologna)

- Adaptive energy management of wireless smart camera networks (UBologna)

- Adaptive TDMA bus allocation and elastic scheduling (UBologna, SSSA)

- Fault Tolerant and Reliable Communication Platforms (KTH)

Hardware-Based Adaptivity

- eDNA: Reconfigurable self-organising and self-healing hardware platform (DTU)

- Adaptive allocation of applications on MPSoC platforms (ETH Zurich, SSSA)

4.6 Design for Predictability and Performance (Transversal Integration activity)

The technical work on Predictability has intersected work in all the Thematic Clusters. We give some examples of resulting progress on several topics:

- Novel collaborations within the PREDATOR project include context-switch-cost-aware scheduling (USaar, AbsInt, SSSA), and clarifications of the notions of predictability (USaar, ETHZ). PREDATOR partners and IST Austria succeeded in advancing the understanding predictability on a formal basis, although this topic is far from sufficiently explored.

- Several partners, including Braunscweig, ETHZ, Linköping, and Uppsala achieved substantial progress on the problem of analyzing the predictability and intereference on shared buses and memories in multi-core systems. An interesting topic for futher research is to develop a formal measure that describes predictability and efficiency in this context. This will prove necessary to compare various architectures and resource sharing methods.

- Work on reconciling timing analysis with compilation includes the development of the WCET-aware compiler WCC by TU Dortmund, in collaboration with USaar, AbsInt, ETHZ, and Pisa. WCC is now able to generate and optimize industrial code, e.g., representing an engine control system, with substantially lower WCET, compared to the GCC compiler. WCC has been extended towards code generation and optimization for multi-process systems

Finally, we organized a workshop on predictability and performance at DATE 2011.

4.7 Industrial Integration (Transversal Integration activity)

This activity groups a set of industrial interactions and collaborations with ArtistDesign teams. The long-term goal is to understand industrial design methodologies and identify the research results that could be applied in these methodologies.

The activities include both technical achievements and dissemination work on the following: General Frameworks for system-level design; Applications to the Automotive Sector; Applications to Chip Design; Applications to Buildings; Applications to Wireless communication technology; Timing Analysis and Predictability; Other Applications.

The level of energy at the meetings organized to foster industrial integration was excellent. In 2009, we proposed the change from Nomadic to Energy Efficient Building has had a re-sounding success. This theme is of increased interest to the European community in response to energy conservation concerns. In this respect, in 2009 a detailed plan was drafted for meetings to be held in 2010 and a modus operandi that included international interaction. The GREEMBED Conference was a result of these efforts. In 2010, we launched a new direction in the area of Synthetic Biology, with the sponsorship and participation to the 2010 International Workshop on Bio-Desing Automation. This area is bound to have a strategic impact on research world-wide. The meetings were very well attended and strong positive feedback was received also from some of the companies involved.

The following table shows the consumption of man months by partner and by work package over the three years of the project.

ARTISTDESIGN - Breakdown of manmonth year 1+2+3

WP		TOTAL	P1 FLORALIS	P2 UJF Verimag	P3 Aachen	P4 Aalborg	P5 Aveiro	P6 Bologna	P7 TUBS	P8 Cantabria	P9 CEA	P10 DTU	P11 Dortmund	P12 EPFL	P13 ESI	P14 ETH Zurich	P15 IMEC	P16 INRIA	P17 TUKL	P18 KTH	P19 Linkoping	P20 Ulund	P21 MDH	P22 OFFIS	P23 Parades	P24 Passau	P25 SSSA PISA	P26 Porto	P27 Saarland	P28 PLU Salzburg	P29 Uppsala	P30 Vienna	P31 YORK	P32 IST Austria	P33 UnivPorto	P34 TRENTO
WP0	Y1:	7,29	6,93	0,36																																
	Y2:	7,70	6,49	1,11																												0,10				
	Y3:	12,64	9,20	3,30																												0,14				
	Planned WP total:	41,00	34,00	6,50																												0,50				
WP1	Y1:	17,30		2,38		1,47	0,50		0,01				0,10	0,10	0,41	1,20	5,04	0,75									2,00	2,35		0,45		0,54				
	Y2:	25,16		7,09		0,48	0,50	0,50	0,26				1,00	0,50		3,00	5,04	0,60								2,20		2,00			0,30	1,14		0,05	0,50	
	Y3:	36,52		7,65		11,75		0,50	2,94		0,80		1,00	0,50	0,08		5,00												0,50	0,50	0,10	0,10		1,00	1,50	2,60
	Planned WP total:	161,45		19,50	7,50	6,50	1,95	6,00	2,50	2,50	4,00	3,00	3,00	1,50	2,50	11,00	20,00	2,50			9,00	3,00	6,50	1,00		5,00	6,00	8,50	4,00	2,50	2,50	4,50		1,00	4,00	10,00
WP2	Y1:	9,07		2,35		0,83	0,50		0,10	0,60			0,30	0,10			1,55	0,52								0,06	1,00	0,50	0,25	0,13		0,28				
	Y2:	22,95		10,31		0,38	0,50	1,00	0,74	0,15			2,00	0,05		1,00	1,56				0,55	0,25	0,70					1,41			0,50	1,37		0,05	0,43	
	Y3:	18,35		7,20				1,00		0,33			2,00				2,00										1,00	0,50		0,50	1,50	1,92			0,40	
	Planned WP total:	31,86		12,50		1,21	1,00	1,00	0,84	0,75			2,30	0,15		1,00	3,11	0,52			0,55	0,25	0,70			0,06	1,00	1,91	0,25	0,13	0,50	1,65		0,05	0,43	
WP3	Y1:	6,75		2,59							1,60			0,50				0,75						0,50	0,25							0,56				
	Y2:	28,05		5,60		13,06					3,70			0,25	0,69			1,50						0,50							2,50				0,25	
	Y3:	22,99		8,61		3,00					2,00			1,00	0,20			1,30						0,50							1,00	0,50			2,20	2,68
	Planned WP total:	68,25		16,00		13,00					9,50			2,00	2,50			5,50						3,00	0,25					2,50	6,50				1,50	6,00
WP4	Y1:	11,76			2,00								1,00				1,87							3,00		0,76			2,00			1,13				
	Y2:	23,13			6,00								6,30				1,92							1,80		1,60			4,50			1,01				
	Y3:	21,09		2,09									6,30				2,00												6,00			4,70				
	Planned WP total:	68,00			8,00								18,50				8,00							7,50		7,50			14,50			4,00				
WP5	Y1:	9,43					1,87		1,53									0,88									2,00	3,15								
	Y2:	7,29					0,54		1,18									0,84								0,25		4,00								0,48
	Y3:	13,37		1,94					3,03									1,00									3,00	2,50								1,90
	Planned WP total:	35,41					2,41		6,50									3,50								2,50	6,00	10,00								4,50
WP6	Y1:	19,91						1,25	2,50			6,00					3,75	2,31					4,10													
	Y2:	39,18						19,50	2,00		2,30	6,00					3,00	2,28					4,10													
	Y3:	19,65		1,94				0,66	1,00		1,00	2,80					5,95	2,00					4,30													
	Planned WP total:	81,00						21,00	8,50		4,50	16,00					14,00	9,00					8,00													
WP7	Y1:	17,13		0,84			0,63	1,25	1,25	3,34	0,24		0,11	0,10	0,83	2,00	1,31				1,40			1,00	1,12		1,00	0,20		0,13		0,38				
	Y2:	21,16		2,34			0,10	6,00	1,50				1,00	0,05	0,47	1,00	1,32				1,40	0,50	0,50						0,35	0,50	2,00	0,75		0,05	0,33	1,00
	Y3:	27,83		5,87	2,00		0,44	1,00	4,20				1,00		0,40	3,60	1,00	0,70			1,50								0,50	0,46	1,00	1,00		1,00	1,16	1,00
	Planned WP total:	88,35		9,50	2,00	2,00	0,73	7,50	5,00	5,50	2,00	2,00	3,00	0,50	3,50	5,00	5,00	2,00			3,00	2,50	2,50	1,00	1,12	1,00	3,00	2,50	2,50	0,50	3,00	3,00		2,00	2,50	3,00
Total Project in Person-Months	Y1+Y2+Y3 total:	445,70	22,62	73,57	8,00	29,81	6,30	31,10	12,25	17,33	11,92	15,60	22,11	3,15	3,08	24,50	38,92	6,12	0,00	0,00	17,35	1,00	9,20	1,50	1,43	2,36	11,00	17,92	13,25	3,87	8,40	15,62	0,00	2,60	6,54	7,28
	Planned total:	575,32	34,00	64,00	17,50	21,50	6,30	35,50	17,00	15,34	20,75	21,00	26,80	4,15	8,50	31,00	48,61	10,52	0,00	0,00	20,55	8,25	17,20	5,00	1,43	13,50	16,00	22,91	21,25	5,63	12,50	13,65	0,00	4,55	11,43	19,00

At project level, and over the third year, there is no significant deviation of consumption of man months to claim.

Some partners do not declare any personnel costs with any adjustments planned retrospectively for next year. The reason given to the coordinator to explain such a situation is that personnel time and personnel costs had already been claimed on other projects or by specific own resources.

The breakdown of man month had been updated in the new DoW (Annex I approved by the Commission on 29/3/2010)

In a nutshell, 77.5% of global estimated man months had been consumed over the three years of the project. The following table shows the breakdown of consumption by WP.

		TOTAL	% of manmonth consumption by WP
WP0	Y1:	7,29	67,39%
	Y2:	7,70	
	Y3:	12,64	
	Planned WP total:	41,00	
WP1	Y1:	17,30	48,92%
	Y2:	25,16	
	Y3:	36,52	
	Planned WP total:	161,45	
WP2	Y1:	9,07	158,10%
	Y2:	22,95	
	Y3:	18,35	
	Planned WP total:	31,86	
WP3	Y1:	6,75	84,67%
	Y2:	28,05	
	Y3:	22,99	
	Planned WP total:	68,25	
WP4	Y1:	11,76	82,32%
	Y2:	23,13	
	Y3:	21,09	
	Planned WP total:	68,00	
WP5	Y1:	9,43	84,98%
	Y2:	7,29	
	Y3:	13,37	
	Planned WP total:	35,41	
WP6	Y1:	19,91	97,21%
	Y2:	39,18	
	Y3:	19,65	
	Planned WP total:	81,00	
WP7	Y1:	17,13	74,84%
	Y2:	21,16	
	Y3:	27,83	
	Planned WP total:	88,35	
Total Project in Person-Months	Y1+Y2+Y3 total:	445,70	
	Planned total:	575,32	77,47%

For the third year of the project, 172 man months had been declared by the Consortium. It represents quite 30 % of global estimated man months.

At each WP level, the rate of consumption goes from 24% to 57%. The following table shows the global consumption of man months by WP for the third year of the project.

		TOTAL	% of manmonth consumption by WP
WP0	Y1:	0,00	30,83%
	Y2:	0,00	
	Y3:	12,64	
	Planned WP total:	41,00	
WP1	Y1:		22,62%
	Y2:		
	Y3:	36,52	
	Planned WP total:	161,45	
WP2	Y1:		57,60%
	Y2:		
	Y3:	18,35	
	Planned WP total:	31,86	
WP3	Y1:	0,00	33,68%
	Y2:	0,00	
	Y3:	22,99	
	Planned WP total:	68,25	
WP4	Y1:	0,00	31,01%
	Y2:	0,00	
	Y3:	21,09	
	Planned WP total:	68,00	
WP5	Y1:	0,00	37,76%
	Y2:	0,00	
	Y3:	13,37	
	Planned WP total:	35,41	
WP6	Y1:	0,00	24,26%
	Y2:	0,00	
	Y3:	19,65	
	Planned WP total:	81,00	
WP7	Y1:	0,00	31,50%
	Y2:	0,00	
	Y3:	27,83	
	Planned WP total:	88,35	
Total Project in Person-Months	**Y3 total:**	**172,44**	
	Planned total:	**575,32**	29,97%

5. Deliverables and milestones tables

Deliverables

Del N°	Deliverable name	WP N°	Lead participant	Nature	Dissemination level	Due delivery date from Annex 1	Delivered Yes/No	Actual / Forecast delivery date	ID
Table 1.Deliverables - Year 3									
WP0 : Joint Programme of management activities (JPMA)									
D-0.1	Periodic report	0	Floralis	Report	Public	T0+36	Yes	Actual delivery date	D1-(0.1)-Y3 Periodic report
D-0.2	Project activity report	0	UJF Verimag	Report	Public	T0+36	Yes	Actual delivery date	D2-(0.2)-Y3 Project Management Report
WP1 : Joint programme of integration activities (JPIA)									
D-1.0	Integration activities report	1	UJF-Verimag	Report	Public	T0+36	Yes	Actual delivery date	D3-(1.0)-Y3 Integration Activities Report
WP2 : Joint programme of activities for spreading excellence (JPASE)									
D-2.0	Spreading excellence report	2	UJF-Verimag	Report	Public	T0+36	Yes	Actual delivery date	D4-2-0-Y3_Spreading_Excellence
WP3 : Thematic cluster : modeling and validation (JPRA)									
D-3.1	Modelling report	3	UJF/Verimag	Report	Public	T0+36	Yes	Actual delivery date	D5-(3.1)-Y3 Modeling
D-3.2	Validation report	3	Aalborg	Report	Public	T0+36	Yes	Actual delivery date	D6-(3.2)-Y3 Validation
WP4 :Thematic cluster : Software synthesis, code generation and timing analysis (JPRA)									
D-4.1	Software synthesis, code generation	4	Dortmund	Report	Public	T0+36	Yes	Actual delivery date	D7-(4.1)-Y3 Software Synthesis, Code Generation
D-4.2	Timing analysis	4	Malardalen	Report	Public	T0+36	Yes	Actual delivery date	D8-(4.2)-Y3 Timing Analysis
WP5 :Thematic cluster : Operatng systems and networks (JPRA)									
D-5.1	Resource-aware operating systems	5	Pisa	Report	Public	T0+36	Yes	Actual delivery date	D9-(5.1)-Y3 Resource-aware Operating Systems
D-5.2	Scheduling and ressource management	5	York	Report	Public	T0+36	Yes	Actual delivery date	D10-(5.2)-Y3 Scheduling and Resource Management
D-5.3	Embedded real-time networking	5	Univ Porto	Report	Public	T0+36	Yes	Actual delivery date	D11-(5.3)-Y3 Real-Time Networks
WP6 : Thematic cluster : Hardware platforms and MPSoC design									
D-6.1	Platform and MPSoC design	6	Bologna	Report	Public	T0+36	Yes	Actual delivery date	D12-(6.1)-Y3 Platform and MPSoC Design
D-6.2	Platform and MPSoC analysis	6	DTU	Report	Public	T0+36	Yes	Actual delivery date	D13-(6.2)-Y3 Platform and MPSoC Analysis
WP7 : Transversal Integration (JPRA)									
D-7.1	Design for adaptivity	7	Lund	Report	Public	T0+36	Yes	Actual delivery date	D14-(7.1)-Y3 Design for Adaptivity
D-7.2	Design for predictability	7	Uppsala	Report	Public	T0+36	Yes	Actual delivery date	D15-(7.2)-Y3 Design for Predictability
D-7.3	Industrial integration	7	Trento	Report	Public	T0+36	Yes	Actual delivery date	D16-(7.3)-Y3 Integration Driven by Industrial Applications

Milestones

		Table 2. Milestones - Year 3			
Milestone N°	**Milestone name**	**Due achievement date from Annex 1**	**Achieved Yes/No**	**Actual / Forecast achievement date**	**Comments**
M-Indus-Y3	Industrial liason : ARTEMISIA - Y3	T0+36	**Yes**	Actual achievement date	ArtistDesign has strong links to ARTEMIS, through: • Representation on the ARTEMIS Industry Association Steering Board: o Joseph Sifakis is the CNRS representative o Luca Beninni is the University of Bologna representative • Partner membership in ARTEMIS "B" (Research Organisations & Universities) http://www.artemisia-association.org/member_status o Arne Skou is the Aalborg University representative o Denis Platter is the CEA representative o Joseph Sifakis is the CNRS-Verimag representative o Boudewijn Haverkort is the Embedded Systems Institute representative o Rudy Lauwereins is the IMEC representative o Jean-Pierre Banâtre is the INRIA representative o Eduardo Tovar is the Instituto Superior de Engenharia do Porto representative (Instituto Politécnico do Porto in ArtistDesign) o Gunnar Landgren is the KTH representative o Bernhard Josko is the OFFIS representative o Jan Madsen is the TU Denmark representative o José Carlos Gómez Sal is the University of Cantabria representative o Luca Benini is the University of Bologna representative o Farid Ouabdesselam is the Université Joseph Fourier representative • Strong informal links. For example, the ArtistDesign Strategic Management Board was asked to review and comment on the latest edition of the Strategic Research Agenda, published in 2011.
M-Web-Y3	Web Y3	T0+36	**Yes**	Actual achievement date	Cf. Deliverable D4-2-0-Y3_Spreading_Excellence
M-Web-Y3	International Collaboration Y3	T0+36	**Yes**	Actual achievement date	Cf. Deliverable D4-2-0-Y3_Spreading_Excellence

6. Project management

6.1 Consortium Management Tasks

The consortium management is carried out by the ArtistDesign Strategic Management Board (http://www.artist-embedded.org/artist/-Strategic-Management-Board,938-.html): Joseph Sifakis – chair (UJF/VERIMAG), Luis Almeida (Univ Porto), Karl-Erik Årzén (Lund), Luca Benini (Bologna), Albert Benveniste (INRIA), Bruno Bouyssounouse (UJF/VERIMAG), Alan Burns (York), Giorgio Buttazzo (Pisa), Tom Henzinger (IST Austria), Bengt Jonsson (UPPSALA), Kim Larsen (Aalborg), Jan Madsen (DTU), Peter Marwedel (TU Dortmund), Alberto Sangiovanni (TRENTO), Lothar Thiele (ETH Zurich), Reinhard Wilhelm (Saarland University).

Day to day management of the NoE is carried out by the ArtistDesign office: The Scientific Coordinator is Joseph Sifakis; the Technical Coordinator is Bruno Bouyssounouse, the Administrative, Legal and Financial Coordinator is Olivier Guérard.

The management tasks include (but are not limited to):

- Organize the technical work and meetings
- Ensure that work progresses on track
- Organize, collect and finalize the technical reporting
- Organize, collect and finalize the financial and administrative reporting
- Organize the Spreading Excellence Activities (see the deliverable), and implement the main ones (others are implemented by the partners).
- Take care of management issues (evolution of the budget, changes to the consortium, etc).

The management achievements include:

- A successful Year 3 (all of the points above).

6.2 Problems that have occurred

- No particular problems occurred over the course of year 3

6.3 Changes in the consortium

- None for the third year of the project

6.4 Project Meetings, Dates, Venues

The following section is an extract from the JPASE: Spreading Excellence D4-(2.0)-Y3.

6.4.1 International Collaboration Events organised and funded in Y3

WSS'10
October 29th, 2010
http://www.artist-embedded.org/artist/-WSS-10-.html
An increasing amount of software is not written manually any more. Rather, software is synthesized from abstract models of the required functionality. As a result, the effort of generating software is reduced and software verification typically becomes easier.

- Software synthesis has been implemented in various disperse communities. The workshop aims at bringing the software generation and software synthesis communities together and at identifying research problems which should be addressed by the scientific community.

WESE'10
October 28th, 2010
http://www.artist-embedded.org/artist/-WESE-10-.html
As embedded system designs grow more complex and the time to market diminishes, quality embedded systems education becomes more and more important. This fifth workshop on the subject aims to bring researchers, educators, and industrial representatives together to assess needs and share design, research, and experiences in embedded systems education.

WFCD – 2010
October 24th, 2010
http://www.artist-embedded.org/artist/-WFCD-2010-.html
The workshop aims to discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation. The focus is not only on fundamental results but also on their implementation in methods and tools and their concrete application in areas such as automotive, avionics, consumer electronics and automation.

Memocode 2010
July 26th, 2010
http://www.artist-embedded.org/artist/-Memocode-2010,1162-.html
The goal of MEMOCODE 2010, the eighth in a series of successful international conferences, is to gather researchers and practitioners in the field of the design of modern hardware and software

system to explore ways in which future design methods can benefit from new results on formal methods.

ARTIST Summer School in China 2010
July 18th, 2010
http://www.artist-embedded.org/artist/-ARTIST-Summer-School-in-China-2010-.html
The Summer School offers a number of foundational tutorials, accompanied by a selection of lectures on exciting emerging technologies and industrial applications - given by leading scientific and/or industrial experts.

ARTIST Summer School in Morocco – 2010
July 11th, 2010
http://www.artist-embedded.org/artist/-ARTIST-Summer-School-in-Morocco-.html
This summer school aims at providing a forum for graduate students, but also postgraduates, researchers, and professors, to get in-depth tutorials covering different aspects of the development cycle of embedded systems. This school is also an opportunity to share and discuss recent advances and trends in this field.

ARTIST Summer School South-America 2010
May 26th, 2010
http://www.artist-embedded.org/artist/-ARTIST-Summer-School-South-America-.html
This fourth edition of the school seeks to continue strengthening the cooperation between Europe and South America in the area of embedded systems, both at educational and research levels. For this purpose, the goal of the school is to provide state-of-the-art courses on embedded systems oriented towards advanced students and young researchers. It should also provide a pleasant atmosphere for research-related discussions among the participants.

6.4.2 ARTIST Graduate Courses in Y3

WSS'10
October 29th, 2010
http://www.artist-embedded.org/artist/-WSS-10-.html
An increasing amount of software is not written manually any more. Rather, software is synthesized from abstract models of the required functionality. As a result, the effort of generating software is reduced and software verification typically becomes easier.

- Software synthesis has been implemented in various disperse communities. The workshop aims at bringing the software generation and software synthesis communities together and at identifying research problems which should be addressed by the scientific community.

WESE'10
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6.4.3 Workshops Organized by the ArtistDesign NoE in Y3

Synchron 2010
November 29th - December 3rd 2010   Villa Clythia, Fréjus – France
http://www.artist-embedded.org/artist/-Synchron-2010,1198-.html
Synchronous languages form a distinctive branch of Concurrency Theory. They are based on simple ideas of discrete logical time, explicit parallelism/concurrency and joint discrete reactions as operational behaviours. Their striking features is that such notions are provided to the plain designer him/herself, so that precise timing and time handling is seen as an integral part of functional design, not an extra-functional analysis and simulation afterthought addendum.

UML&FM'2010
November 16th, 2010   Shanghai, China
http://www.artist-embedded.org/artist/-UML-FM-2010-.html
The UML and formal methods communities have been working for a number of years to produce a practical (via UML) and rigorous (via formal methods) approach to software engineering.
UML is the de facto standard for modelling various aspects of software systems in both industry and academia, despite the inconvenience that its current specification is complex and its syntax imprecise. This third workshop will encourage new initiatives of building bridges between informal, semi-formal and formal notations.

WSS'10
October 29th, 2010   Scottsdale, Arizona (USA), within ESWeek 2010
http://www.artist-embedded.org/artist/-WSS-10-.html
An increasing amount of software is not written manually any more. Rather, software is synthesized from abstract models of the required functionality. As a result, the effort of generating software is reduced and software verification typically becomes easier.
Software synthesis has been implemented in various disperse communities. The workshop aims at bringing the software generation and software synthesis communities together and at identifying research problems which should be addressed by the scientific community.

WESE'10
October 28th, 2010   Scottsdale, Arizona (USA), within ESWeek 2010
http://www.artist-embedded.org/artist/-WESE-10-.html
As embedded system designs grow more complex and the time to market diminishes, quality embedded systems education becomes more and more important. This fifth workshop on the subject aims to bring researchers, educators, and industrial representatives together to assess needs and share design, research, and experiences in embedded systems education.

WFCD – 2010
October 24th, 2010   Scottsdale, Arizona (USA), within ESWeek 2010
http://www.artist-embedded.org/artist/-WFCD-2010-.html
The workshop aims to discuss recent results on component-based design with emphasis on design frameworks for real-time systems encompassing heterogeneous composition and models of computation. The focus is not only on fundamental results but also on their implementation in methods and tools and their concrete application in areas such as automotive, avionics, consumer electronics and automation.

FIT 2010

August 30th, 2010   Paris, France (associated with CONCUR 2010)

http://www.artist-embedded.org/artist/-FIT-2010-.html

FIT stands for Foundations of Interface Technologies. Component-based design is widely considered as a major approach to developing systems in a time and cost effective way. Central in this approach is the notion of an interface. Interfaces summarize the externally visible properties of a component and are seen as a key to achieving component interoperability and to predict global system behavior based on the component behavior. To capture the intricacy of complex software products, rich interfaces have been proposed. These interfaces do not only specify syntactic properties, such as the signatures of methods and operations, but also take into account behavioral and extra-functional properties, such as quality of service, security and dependability. Rich interfaces have been proposed for describing, e.g., the legal sequences of messages or method calls accepted by components, or the resource and timing constraints in embedded software. The development of a rigorous framework for the specification and analysis of rich interfaces is challenging. The aim of this workshop is to bring together researchers who are interested in the formal underpinnings of interface technologies.

WCET 2010

July 6th, 2010   Brussels, Belgium (in conjunction with the 22nd Euromicro Conference on Real-Time Systems)

http://www.artist-embedded.org/artist/-WCET-2010-.html

Reliable WCET bounds are a necessary component for the construction and verification of dependable real-time systems. They are an input for doing task CPU allocation, creating task schedules, and performing schedulability analysis.

OSPERT 2010

July 6th, 2010   Brussels, Belgum (in conjunction with ECRTS10)

http://www.artist-embedded.org/artist/-OSPERT-2010-.html

Developers of Real-Time Operating Systems (RTOS) are faced with many challenges arising from two opposing needs: extreme optimisation of resource usage (processor, energy, network bandwidth, etc.) and dynamic configuration, flexible scheduling, component-based development and deployment, etc. While real-time systems continue to be used in many small embedded applications, real-time services are being introduced and used in general-purpose operating systems. Notable examples are the various flavours of Linux that provide support to time-sensitive applications.

ARTIST HW Platforms and MPSoC Technical Meeting

July 6-7, 2010   IMEC, Leuven, Belgium

http://www.artist-embedded.org/artist/-ARTIST-HW-Platforms-and-MPSoC-.html

Mapping Applications to MPSoCs 2010

June 29-30, 2010   St. Goar, Germany

http://www.artist-embedded.org/artist/-map2mpsoc-2010-.html

The aim of the workshop is to provide a forum for brainstorming and road-mapping the future of mapping applications to MPSoCs. Knowledge about constraints and directions for future MPSoC architectures should be collected. Existing mapping techniques should be briefly presented and analyzed. Directions for future research should be proposed and evaluated.

SCOPES 2010

June 28-30, 2010   Schloss Rheinfels, St. Goar, Germany

http://www.artist-embedded.org/artist/-SCOPES-2010-.html

13th International Workshop on Software and Compilers for Embedded Systems SCOPES focuses on the software generation process for modern embedded systems. Topics of interest include all aspects of the compilation process, starting with suitable modeling and specification techniques and programming languages for embedded systems. The emphasis of the workshop lies on code generation techniques for embedded processors. The exploitation of specialized instruction set characteristics is as important as the development of new optimizations for embedded application domains. Cost criteria for the entire code generation and optimization process include runtime, timing predictability, energy dissipation, code size and others. Since today's embedded devices frequently consist of a multi-processor system-on-chip, the scope of this workshop is not limited to single-processor systems but particularly covers compilation techniques for MPSoC architectures.

GREEMBED 2010

April 12th, 2010   Stockholm, Sweden, (in conjunction with CPSWEEK 2010)
http://www.artist-embedded.org/artist/-GREEMBED-2010-.html
Second Workshop on Green and Smart Embedded System Technology: Infrastructures, Methods and Tools.
Efficient production, transmission, distribution and use of energy is a fundamental requirement for our modern society and its economy. Most systems for monitoring and control of energy production, distribution and use are today interconnected and controlled by embedded devices. This offers the opportunity for the creation of new integrated systems offering new products, processes and services with greater efficiency and better situation awareness to end-users and service and infrastructure owners.

FESA 2010

April 12th, 2010   KTH, Stockholm (Sweden) (within CPS Week)
http://www.artist-embedded.org/artist/-FESA-2010-.html
Formalisms for Embedded Systems Architecture description & visualization:

- What key formalisms, ADL's and visual languages, for design of embedded systems are there and what are the trends?
- What is the maturity (languages, tools) and industrial adoption of such formalisms?
- What are the key outstanding research issues to pave way for larger scale industrial adoption?

WARM 2010

April 12th, 2010   Stockholm, Sweden (within CPS Week)
http://www.artist-embedded.org/artist/-WARM-2010-.html
The focus of WARM is software-based approaches to adaptive resource management for soft or adaptive embedded real-time applications, e.g., multimedia applications or non-safety critical control applications. Special emphasis will be given to multi-resource management, in particular including CPU time and power consumption. Special emphasis will also be given to multi-core platforms.

6.4.4 Workshops sponsored in Y3

The following workshops were not organised as "ARTIST" workshops, but nonetheless received at least partial funding from the NoE.

CRTS 2010

November 30th, 2010   San Diego, CA, USA (co-located with RTSS 2010)
http://retis.sssup.it/crts2010/
The CRTS workshop provides a forum for researchers and technologists to discuss the state-of-the-art, present their works and contributions, and set future directions in compositional technology for real-time embedded systems.

SCOPES 2010

June 28-30, 2010   Schloss Rheinfels, St. Goar, Germany
http://www.scopesconf.org/scopes-10/
13th International Workshop on Software and Compilers for Embedded Systems SCOPES focuses on the software generation process for modern embedded systems. Topics of interest include all aspects of the compilation process, starting with suitable modeling and specification techniques and programming languages for embedded systems. The emphasis of the workshop lies on code generation techniques for embedded processors. The exploitation of specialized instruction set characteristics is as important as the development of new optimizations for embedded application domains. Cost criteria for the entire code generation and optimization process include runtime, timing predictability, energy dissipation, code size and others. Since today's embedded devices frequently consist of a multi-processor system-on-chip, the scope of this workshop is not limited to single-processor systems but particularly covers compilation techniques for MPSoC architectures.

Amir Pnueli Memorial Symposium

May 7-9, 2010   New York University (USA)
http://www.cs.nyu.edu/acsys/pnueli/

UML&AADL'2010

March 24th, 2010   University of Oxford, UK
http://www.artist-embedded.org/artist/-UML-AADL-2010-.html
Due to the even more increased complexity of distributed, real-time and embedded systems (DRE), the need for a model-driven approach is more obvious in this domain than in monolithic RT systems. The purpose of this workshop is to provide an opportunity to gather researchers and industrial practitioners to survey existing efforts related to behaviour modelling and model-based analysis of DRE systems. We will address all aspects of the representation, analysis, and implementation of Distributed, Real-time and Embedded systems (DRE) system behaviour and/or architecture models.

6.5 Project planning and status

The project has fully achieved its objectives and technical goals for the period.
All milestones had been reached for the third year and all deliverables had been produced.

6.6 Impact of possible deviations from the planned milestones and deliverables, if any

There were no significant deviations from the planned milestones or deliverables.

6.7 Any changes to the legal status of any of the beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs;

During Year 3, there were no changes in legal status for any of the beneficiaries.

6.8 Development of the Project website

The following section is an extract from the JPASE: Spreading Excellence D4-(2.0)-Y3.

ArtistDesign Web Portal

Objectives and Background Information

The ArtistDesign Web Portal is a major tool for Spreading Excellence within the Embedded Systems Community. Its aim is rather ambitious: to be the focal point of reference for events and announcements of interest to the embedded systems community.
The web portal disseminates information about contacts (ArtistDesign core and affiliated partners), the ArtistDesign JPA activities, as well a fairly thorough set of links to sites of interest to the embedded systems community.
As can be seen, a great deal of effort has been put into the web site, both for ergonomics / graphical quality, as for the contents.
The web site includes several features that help keep it coherent and up to date:

- o Authorised users (principally, the ArtistDesign partners) can access the back end of the site to modify and update information directly. The changes are immediately visible on the site, which greatly streamlines the updating process.
- o It's possible to track changes and go back to previous versions of individual web pages.
- o Events are automatically sorted by date, and transferred to 'Past Events'. When appropriate.
- o Structural information (hierarchy of pages) is maintained automatically.
- o Ergnomics are set for the entire site. The "look and feel" of the site is always homogeneous thoughout the site. It's possible to change these ergonomics, and these changes are applied homogeneously throughout the site, via automated machanisms.
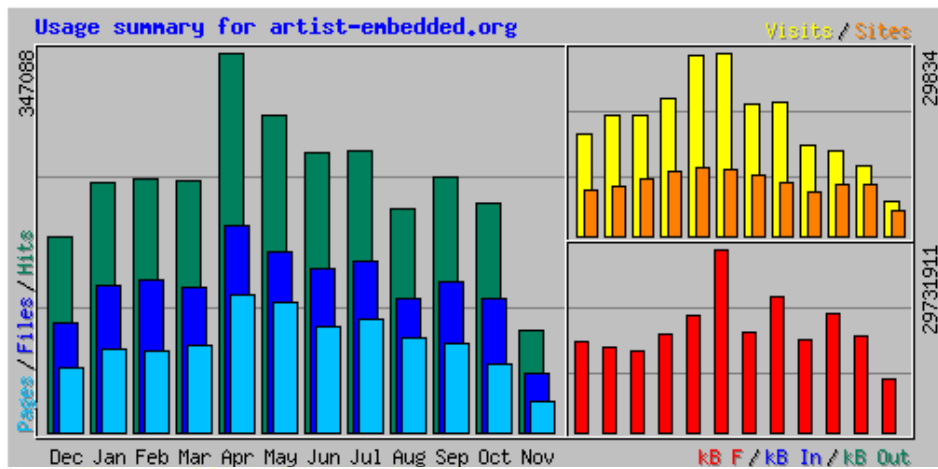
Structure

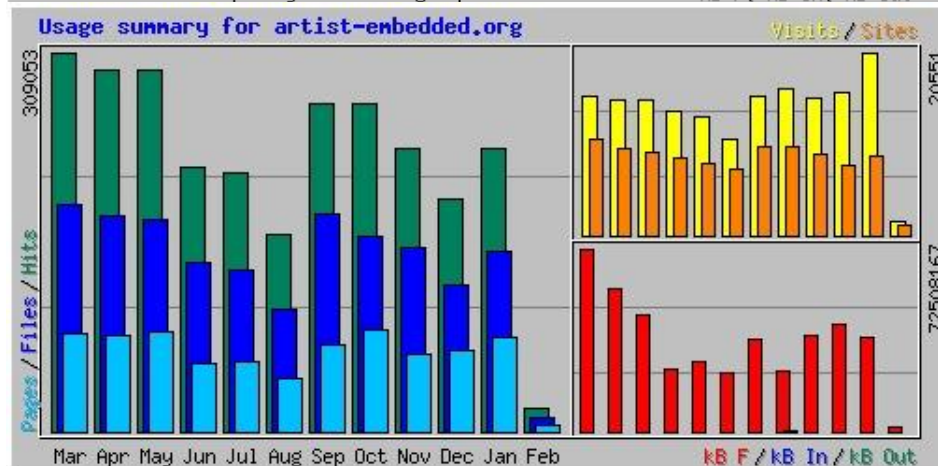The structure of the ArtistDesign web site is visible on the Site Map:
http://www.artist-embedded.org/artist/spip.php?page=plan). Analysis of Visits to the Portal
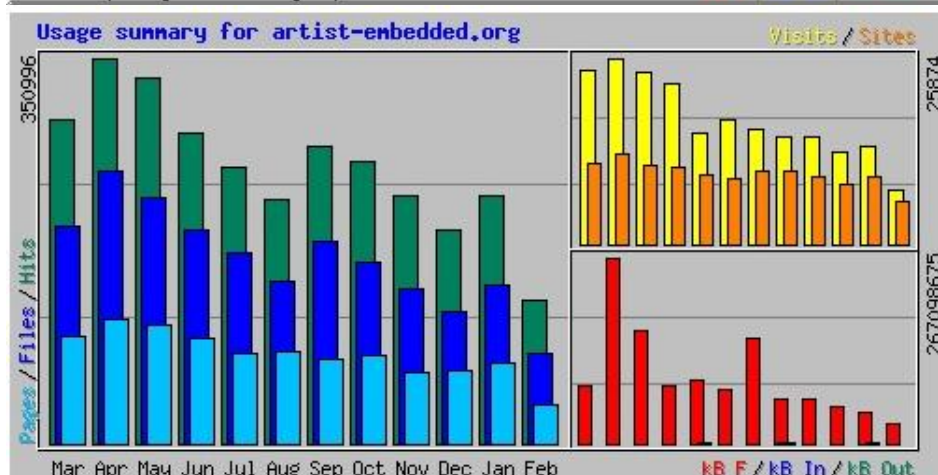
Number of Visits Overall

Year 1

Year 2

Year 3

The main conclusion from this analysis is that visits to the site are largely driven by the ARTIST events organised (workshops, conferences, schools), and that this drives visits to the other sections: "Embedded Systems Links", and "Research and Integration".

Overall, Year1 and Year3 saw a greater number of visits to the web portal than in Year2.

Such yearly variations do not necessarily imply that the portal has had less impact. For example, if key information (eg: the program or registration or venue) is missing from a workshop page, then it

can logically be expected that visitors will return often, generating *more* traffic for what is, finally, *lower* impact and usability.

It is important to note that a deep analysis of the pertinence and effectivity of the web portal would need to go beyond the numerical analysis provided here. The real impact of a website is in whether or not the members of the community find the information relevant, and how it helps them in their daily tasks.

Visits Distribution within the site

The tables below show the distribution of visits to the various parts of the portal.

Year 1

Category	%
▶ 15. About the Artist2 NoE	1.5%
▶ 20. Participants	10.8%
▶ 25. Research and Integration	7.4%
▼ 30. Dissemination	54.5%
▶ 20. Workshops	31.7%
▶ 30. Schools and Seminars	19.1%
60. Publications	2.1%
▶ 70. Contributions to Standards	1.6%
▼ 35. Embedded System Links	20.4%
10. Journals	2.5%
▶ 20. Conferences	1.8%
30. Standards	0.7%
▶ 35. Tools and Platforms	3.7%
▶ 40. Main Projects	2.7%
50. Position Papers	1.2%
55. Roadmaps	0.9%
60. Newsletters and Magazines	1%
▶ 70. Announcements	5.6%
▶ 40. intranet	1.1%
▶ 70. Artist2 Reviews	3%
71. ArtistDesign Reviews	0.6%
76. Reporting on Mobility	0.7%

Year 2

▸ 10. Home Page	1.2%	
▸ 15. About the Artist2 NoE	4.7%	
▸ 16. About the ArtistDesign NoE	1.8%	
▸ 20. Participants	7%	
25. Research and Integration	0.4%	
▾ 30. Dissemination	64.2%	
▸ 20. Workshops	45.5%	
25. Past Workshops	0.3%	
▸ 30. Schools and Seminars	15.1%	
40. International Collaboration	0.4%	
60. Publications	0.6%	
▸ 70. Contributions to Standards	1.3%	
80. Course Materials Available Online	0.6%	
91. Calendar of Events	0.3%	
▸ 35. Embedded System Links	11.7%	
▸ 40. intranet	2.1%	
41. intranet	0.9%	
▸ 71. ArtistDesign Reviews	4.9%	

Year 3

▸ 15. About the Artist2 NoE	7.8%	
▸ 16. About the ArtistDesign NoE	1.2%	
▸ 20. Participants	7.6%	
▸ 25. Research and Integration	1.1%	
▾ 30. Dissemination	63.5%	
▸ 20. Workshops	37.8%	
▸ 30. Schools and Seminars	22.5%	
60. Publications	1.1%	
▸ 70. Contributions to Standards	1.2%	
80. Course Materials Available Online	0.6%	
▸ 35. Embedded System Links	14.4%	
▸ 40. intranet	1.3%	
41. intranet	0.2%	
▸ 70. Artist2 Reviews	0.8%	

7. Explanation of the use of the resources

For the third year of the project, there is no significant financial deviation to take into account.

Amounts claimed on personnel cost are closely linked with the effort in terms of man month claimed in the project.
As previously explained, some partners did not declare any personnel costs (no man months allocated to the project over the second year) with any adjustments planned retrospectively for next year.

The following table explains the costs claimed by partners per type of expenditures.

N°	Participant	Manpower	Equipment	Consumables	Travel	Other costs	Other costs (WP2)	Overheads	Total
	ARTISTDESIGN - ESTIMATED ELIGIBLE COSTS PER TYPE OF EXPENDITURES Y3+ADJ								
1	FLORALIS	23 731 €			2 912 €		152 571 €	5 328 €	**184 542 €**
2	UJF	275 763 €			3 012 €		1 653 €	168 254 €	**448 682 €**
3	Aachen	11 967 €						7 179 €	**19 146 €**
4	Aalborg	55 634 €			2 731 €		10 862 €	35 019 €	**104 246 €**
5	Aveiro								**0 €**
6	Bologna	6 342 €			16 318 €			13 594 €	**36 254 €**
7	TUBS	11 850 €			6 550 €			11 040 €	**29 440 €**
8	Cantabria	10 443 €			18 275 €	4 622 €		20 004 €	**53 344 €**
9	CEA	16 451 €			2 257 €		2 500 €	8 666 €	**29 874 €**
10	DTU	28 073 €			9 757 €		13 239 €	22 698 €	**73 767 €**
11	Dortmund	64 341 €	243 €		4 218 €		2 846 €	37 350 €	**108 998 €**
12	EPFL	6 972 €			1 589 €			5 136 €	**13 697 €**
13	ESI	10 253 €			422 €			6 405 €	**17 080 €**
14	ETH Zurich	60 174 €			9 244 €			41 650 €	**111 068 €**
15	IMEC	85 754 €			1 094 €			36 387 €	**123 235 €**
16	INRIA	13 793 €			2 595 €		5 595 €	10 415 €	**32 398 €**
17	TUKL	0 €			3 367 €			2 020 €	**5 387 €**
18	KTH	0 €			28 767 €	10 319 €	13 917 €	23 451 €	**76 454 €**
19	Linköping	13 586 €			11 887 €			15 283 €	**40 756 €**
20	ULund	0 €			6 171 €			3 702 €	**9 873 €**
21	MDH	22 041 €			5 529 €		3 000 €	16 542 €	**47 112 €**
22	OFFIS	2 794 €			10 881 €			8 204 €	**21 879 €**
23	Parades								**0 €**
24	Passau	0 €			2 446 €			1 467 €	**3 913 €**
25	SSSA-Pisa	18 307 €			11 888 €		9 375 €	14 742 €	**54 312 €**
26	Porto	9 156 €			6 244 €		869 €	9 240 €	**25 509 €**
27	Saarland	29 665 €			4 780 €			20 667 €	**55 112 €**
28	PLU-Salzburg	0 €			24 899 €		3 000 €	14 939 €	**42 838 €**
29	Uppsala	20 953 €			13 716 €			20 801 €	**55 470 €**
30	Vienna	13 396 €			11 800 €			15 117 €	**40 313 €**
31	York	3 192 €			25 127 €			17 045 €	**45 364 €**
32	IST Austria	7 345 €			9 736 €		4 820 €	10 248 €	**32 149 €**
33	Unv Porto	23 106 €			5 773 €		3 155 €	17 327 €	**49 361 €**
34	TRENTO	25 180 €			3 311 €			12 590 €	**41 081 €**
	TOTAL	**870 262 €**	**243 €**	**0 €**	**267 296 €**	**14 941 €**	**227 402 €**	**652 510 €**	**2 032 654 €**

Please note that the "other cost" box is related to specific costs and sponsorship to the spreading excellence activity (WP2).
Details are provided in the JPASE deliverable Spreading Excellence D4-(2.0)-Y3.
Floralis, co organizer of the Summer School in Autrans (France) received money from the fees registration. The amount of receipts is 41 834€ and does not appear in the table above. According to the financial rules of FP7 projects, these receipts had been declared in FormC for the Year3.

The following table provides details on the different work packages with explanations on the tasks performed related to the costs claimed above:

Participants	WPs	person months	Comments
ARTISTDESIGN - YEAR 3
Table - COMMENTS ON WORK carried out
Partner 1 Floralis	**WP00**	9,20	**Legal, Administratvie and Financial Coordination of the project** - <u>Travel expenses</u>: Brussels meeting & review
	WP02	0,00	expenses related to the "spreading excellence" activity.
TOTAL		**9,20**	
Partner 2 UJF	WP00	3,30	**Scientific and Technical coordinators of the project** - Joint Programme of Management Activities (JPMA)
	WP01	7,65	Joint Programme of Integration Activities (JPIA)
	WP02	7,20	Joint Programme of Activities for Spreading Excellence (JPASE)
	WP03	8,61	Modeling and Validation (JPRA)
	WP04	2,09	
	WP05	1,94	
	WP06	1,94	
	WP07	5,87	Transversal Integration (JPRA)
TOTAL		**38,60**	
Partner 3 Aachen	WP01	0,00	
TOTAL		**0,00**	
Partner 4 Aalborg	WP01	11,75	Kim G. Larsen: ArtistDesign Year 2 Review, Brussels, February 2010 - Conferences/Workshops May-June 2010. Design for adaptivity.
	WP02	0,00	Travel expenses: Alexandre David: Conference Aug-Sep 2010. PhD School March 2010 CPH. Planning of PhD school.
	WP03	3,00	
	WP07	2,00	Design for adaptivity driven by industrial applications
TOTAL		**16,75**	
Partner 6 Bologna	WP01	0,00	Participation in ArtistDesign meetings and review: participation of Prof. Luca Benini to ArtistDesign meetings, of Davide Brunelli to review meeting and Andrea Bartolini to SCC Meeting in Braunschweig
	WP02	0,00	Constribution to workshops, conferences, industry interfacing: participation of Jacopo Olivo to Pervasive Health 2010, of Prof. Luca Benini to Summer School ArtistDesign and of Andrea Bartolini to Eurosys
	WP06	0,66	1. Hardware support for run-time management of multi-core architectures; 2. Design of High-Efficiency Energy Harvester for Autonomous Embedded Systems; 3. Adaptive TDMA bus Allocation and Elastic Scheduling; 4. Instruction set simulator for thousand-core architectures running on GPGPUs; 5. Policies for thermal control; 6. Scheduling for conditional task graphs in multi-processor systems-on-chip; 7. Power, Thermal and Reliability Aware Resource Managment for Multicore Systems.
	WP07	0,44	1. Predictable and efficient non-preemptive scheduling of multi-task applications; 2. Adaptive power management and energy harvesting systems; 3. Energy intake prediction algorithms for systems powered by energy harvesters; 4. Adaptive energy management of wireless smart camera networks;
TOTAL		**1,10**	
Partner 7 TUBS	WP01	0,50	
	WP02	1,00	Constribution to workshops, conferences, industry interfacing
	WP06	1,00	Investigation of multicore architectures w.r.t. reliability, performance
	WP07	1,00	Integration of analysis tools, demonstrator for online performance control
TOTAL		**3,50**	
Partner 8 Cantabria	WP01	2,94	Contribution to Project Meetings, organization of workshops and conferences, and links to ARTEMIS
	WP05	3,03	Joint research and dissemination of scheduling theory, real-time operating systems, and real-time
	WP07	4,20	Real-time component-based design platform, and contribution to OMG standards
TOTAL		**10,17**	
Partner 9 CEA	WP02	0,33	Organisation of the workshops UML&AADL and UML&FM
	WP03	2	Continuation of work on multi-MoCC within MARTE and in EC3M a framework for executing MARTE-based
	WP06	1	Continuation of work on support for dynamic deployment and execution of multi-task applications.
TOTAL		**3,33**	
Partner 10 DTU	WP01	0,20	Travel expenses: Artist reporting-Brussels, Artist cluster meeting - Leuven, Workshop/conference - ESWeek in Phoenix, MPSoC forum - Gifu, Japan, Brokarage event - Madrid
	WP02	0,60	Organized Graduate course on Advanced Topics in Embedded Systems. Participating in key conferences in the area, ESWeek (Phoenix, US), MPSoC (Gifu, Japan). Organized tutorial on Hardware/Software Codesign at Norchip (Tampere, Finland). Organized national interestgroups for industry on Green-IT and Safety-
	WP06	2,80	System-level modeling and analysis of MPSoC, Component-based service model, Run-time ressource management, Fault tolerant mixed hard/soft real-time systems, Programming models for MPSoC, Design
	WP07	0,00	Bio-inspired self-organizing and self-healing hardware architecture. Patent pending, cooperation with NASA/JPL
TOTAL		**3,60**	
Partner 11 Dortmund	WP01	1,00	<u>Travel expenses</u>: travel to workshops mentioned under WP02 to WP04
	WP02	2,00	Organization of the workshop on embedded system education, preparation of second edition of ES textbook
	WP04	6,30	Organization of the workshops on mapping applications to MPSoCs, SCOPES, and Software Synthesis; Integration of MPArm simulation platform with run-time library for OS interface
	WP07	1,00	Heading of a spin-off for industrial applications; cooperation with PREDATOR predictability project;
TOTAL		**10,30**	

Partner 12 EPFL	WP01	0,50	Travel expenses: Vasileios Pavlidis: Travel and participation to Annual Artist Design Meeting (IMEC) Hu Xu and Shashi Kanth Bobba: Travel and participation in the ARTIST Summer School Europe 2010
	WP02	1,00	Research visit, collaboration and organization with Prof. Luca Benini
	WP03	0,00	(i) Development of process-induced skew variability for clock distribution networks in 3-D ICS
	WP07	0,00	(ii) Development of analytic thermal models for vertically integrated systems (iii) Design automation tools for MPSoC and NoC (iv) Optimization techniques for thermal management of MPSoC and NoC *As a part of WP6: Hardware Platforms and MPSoC
TOTAL		**1,50**	
Partner 13 ESI	WP01	0,08	Contribution to Transversal Activity report
	WP03	0,20	Participation in Review meeting and preparation of delivertables
	WP07	0,40	Adaptive (agent-based) control for warehousing, with Vanderlande Industries
TOTAL		**0,68**	
Partner 14 ETH Zurich	WP06	5,95	1. Energy-aware mapping of tasks onto MPSoC platforms; 2. Automatic design flow for mapping algorithms onto MPSoC platforms; 3. Multi-objective optimization for energy aware compilation strategies; 4. Component-based analysis under power and temperature constraints; 5. Component-based analysis of complex MPSoC combining various models of computation.
	WP07	3,60	1. Adaptive power management and energy harvesting systems; 2. Adaptive analysis and allocation of applications on MPSoC platforms; 3. Adaptive and automatic WCET-aware compiler framework; 4. Predictable Multi-core Communication
TOTAL		**9,55**	
Partner 15 IMEC	WP01	5	Contribution to integration activities
	WP02	2	Contribution to spreading excellence
	WP04	2	Contribution to Activity Software Synthesis and Code Generation
	WP05	1	Contribution to Activity Scheduling and Resource Mgt
	WP06	2	Organization of cluster meeting at imec; Contribution to Activities
	WP07	1	Contributions to Activity integration Driven by Industrial Applications
TOTAL		**13,00**	
Partner 16 INRIA	WP01		Travel expensives : travel for the Artist-Design Meeting to Bruxelles (10-12/02/10)
	WP03	1,30	1. Probabilistic contract framework.
	WP07	0,70	1. Semantics of the time-predictable synchronous language PRET_C;
TOTAL		**2,00**	
Partner 17 TUKL	WP01	0,00	TUKL / work was done by personnel not funded by ARTIST Travel expenses: Meeting - Brussels, Seminar - Dagstuhl, Meeting - London, Meeting - Paris, Meeting - Eindhoven, Meeting - Brussels, Meeting/conference - San Diego
	WP02	0,00	
	WP05	0,00	
	WP07	0,00	
TOTAL		**0,00**	
Partner 18 KTH	WP02	0,00	FESA ArtistDesign workshop organization and implementation
	WP03	0,00	**Modeling**: Further the EAST-ADL architecture description language. Model integration and model evolution. **Validation:** Safety analysis integrated with model based development.
	WP06	0,00	**Analysis**: Contract based architecture dimensioning, Moteling and analysis of heterogeneous systems; **Design**: Integration of memory and communication architecture
	WP07	0,00	**Design for Adaptivity**: Fault tolerant and reliable communication platforms; **Industrial applications:** Several workshops with industry; Research incorporating industry including Artemis projects
TOTAL		**0,00**	
Partner 19 Linkoping	WP01		Travel expenses: Artist reporting-Brussels, Artist cluster meeting - Leuven, Meeting - Torino, Workshop/conference - Phoenix, Meeting/conference - San Diego, Summer school - Grenoble, Meeting/conference/workshop - Dresden, Meeting/conference/workshop - Grenoble.
	WP06	4.30	Analysis and optimisation techniques for control–scheduling co-design have been developed, for multimode control systems and for control systems based on a self-triggering policy. Thermal aware energy optimisation. The main goal for the third year was to develop a new effcient and fast system-level thermal anlysis approach.
	WP07	1.50	Analysis and optimisation of fault-tolerant hard real-time embedded systems. The main goal for the third year was to develop efficient fault tolerant bus access policies for distributed embedded systems. Analysis and optimisation of the hardware and software overhead required for efficient hardare/software implementation of error detection techniques.
TOTAL		**0,00**	
Partner 20 Ulund	WP05		Partner in the OS and Networks cluster. Coordinated research on event-based control and co-design of
	WP07		Leader for the Design for Adaptivity transversal activity. Organized workshop, editing deliverable, preparing review, setting up wiki, Coordinated research on adaptivity in embedded systems.
TOTAL		**0,00**	
Partner 21 MDH	WP01		Activity leader Timing Analysis. Travel expenses: GA meeting/review, activity meetings, two joint technical
	WP02		WCET Workshop
	WP04		Research on timing analysis for MPSoC systems
	WP07		Research on parametric timing analysis for adaptive systems
TOTAL		**0,00**	

Partner 22 OFFIS	WP03	0,50	Activities on a common meta-model approach supporting interoperability of models and tools taking into account results from various projects like SPEEDS, ATESST, CESAR, SPES2020. Traveling: Participating at general ArtistDesign Meeting and Review (Brussels). A. Pnueli Memorial Kolloquium (New York); FORMS/Format Workshop (Braunschweig); Workshop Dagstuhl;
	WP07	0,00	Interaction with industry, co-organization of SafeTRANS Industrial Days on "Interdependency between Safety and Security in Embedded Systems" (at DB Netz AG in Frankfurt) and "Model-based Systems Engineering" (Mercedes Event Center in Sindelfingen). Coordination of activities and meetings with partners and companies from the transportation industry in the context of EICOSE (in the framework of the technology platform ARTEMIS) (Paris, Rome, Gent). Keynote Speech on "The German Embedded Systems Roadmap" at the International Policy Conference (Vienna), and at the BITKOM Symposium Embedded
TOTAL		**0,50**	
Partner 24 Passau	WP01	0,00	WORK CARRIED OUT: 1. Methods of automatic loop parallelization (Michael Claßen and Armin Größlinger) 2. Programming of and automatic code generation for GPGPUs (Armin Größlinger) 3. Use analysis of the C preprocessor cpp (Jörg Liebig) On points 1 and 2, we are linked with Marwedel's group in Dortmund. The cooperation is expected to intensify this year.
	WP04	0,00	PARTICIPATIONS AND PRESENTATIONS: -Christian Lengauer: ArtistDesign Year 2 Review, Brussels, 11-12 February 2010
	WP07	0,00	-Christian Lengauer: Keynote "Parallelization", D-CON Workshop, Bamberg, 4-5 March 2010 (not billed to ArtistDesign) -Christian Lengauer: Participation in Dagstuhl Seminar 10191 "Program Compositiona dn Optimization: Autotuning, Scheduling, Metaprogramming and Beyond", 9-12 May 2010 (not billed to Artistdesign) -Christian Lengauer: Participation in 3rd Workshop on Mapping of Applications to MPSoCs, St. Goar, 29-30 June 2010 -Christian Lengauer: Participation in Euro-Par 2010, Ischia, 30 August-3 September 2010, Chair of the
TOTAL		**0,00**	
Partner 25 SSSA PISA	WP01	0,50	Participation in the General Assembly and Review Meeting and Cluster coordination.
	WP02	1,00	Organization of 4 Graduate Courses on Real-Time Kernels, Real-Time Networks, Real-Time Calculus, and
	WP05	3,00	Contributions to the development and maintainance of three operating systems used by other partners: Shark, Erika and RR-Linux (Linux with Resource Reservation) . Research on multiprocessor scheduling, resource mangement, wireless sensor networks, and energy management. Travel: Meeting in Pisa (April 2-3, 2010) and in conjunction with ECRTS10 PC meeting; CPS Week10 conference; RTN10 workshop;
	WP07	0,50	Contributions to the transversal activity "Design for Adaptivity"
TOTAL		**5,00**	
Partner 26 PORTO	WP01	0,50	Participation in the General Assembly and Review Meeting and contributions to the year 3 tuning of objectives of concerned clusters and transversal activities.
	WP02	0,50	Organization of OSPERT2010
	WP05	2,50	Contributions to the 3 activities, namely in efforts concerning multiprocessor scheduling, QoS and resource mangement, cluster-tree wireless sensor networks, and energy management; Tavel: Meeting in conjunction with ECRTS10 PC meeting; CPS Week10 conference; RTN10 workshop; Meetings with other partners
	WP07	0,46	Contributions to work Developed concerning Design for Adaptivity
TOTAL		**3,96**	
Partner 27 SAARLAND			
	WP04	6,00	Research on operating modes and timing analysis
TOTAL		**6,00**	
Partner 28 PLU SALZBURG	WP01	0,10	Participation in ArtistDesign plenary meeting and review, February 2010
	WP02	0,50	Organization of EuroSys 2011, OOPSLA 2010; participation in ISTA symposium, EuroSys, HotCloud,
	WP03	1,00	Research on cyber-physical cloud computing and runtime programming
	WP07	1,00	Organization and acquisition of collaborative Austrian Research Network project and grant on Rigorous
TOTAL		**2,60**	
Partner 29 UPPSALA	WP01	0,10	Participation in ArtistDesign plenary meeting and review, February 2010
	WP02	1,50	Participation in Key conferences of the area: - Cyber-Physical Systems Week, Stockholm, April, 2010 Participation in Summer schools: - Lecturing at Artist Summerschool, Beijing, Wang, July 2010, - Participation at ARTIST Summer School in Europe, Autrans, France, September 2010. Organization of Summer schools: - UPMARC Summser School on Multicore Progrmaming, Uppsala, June 2010.
	WP03	0,50	Research Work on: - Verification of parallel, timed and infinite-state systems, - Timing analysis of multicore software. - Scheduling for multiprocessor systems, - Generation of models for components of embedded systems,
	WP07	1,00	Research work on: - Schedulability analysis for multiprocessor programs. - Modeling of resource usage and performance analysis for of multicore programs. Coordination of transversal cluster on Predictability, including - preparation for co-organization of Workshop on Reconciling Performance with Predictability (RePP), in Grenoble, France, March 2011. - writing of annual report.
TOTAL		**3,10**	

Partner 30 VIENNA	WP00	0,14	Reporting, Financial Management
	WP01	0,99	Meetings at WCET, ECRTS, SEUS, and ISORC; research visit of Benedikt Huber to Malardalen University (coop. on path analysis and coding policies)
	WP02	1,92	Direction of WCET workshop; steering committee SEUS workshop; involvement in planning and organization of the SEUS workshop; presentations at meetings (WCET, ECRTS, SEUS, ISORC)
	WP04	4,70	Fundamentals on WCET analyzability and timing stability; coding styles to support WCET analysis
	WP07	1,16	Time-predictable memory hierarchies; code generation to avoid timing anomalies and improve temporal predictability
TOTAL		**8,91**	
Partner 31 YORK	WP01	0,00	Resource Management and Scheduling). His work was involved with all aspects of this activity including maintaining the wiki and producing the deliverable.
	WP04	0,00	
	WP05	0,00	
	WP07	0,00	
TOTAL		**0,00**	
Partner 32 IST Austria	WP03	2,20	Robustness and predictability were identified as main challenges in embedded system design and were considered from a conceptual viewpoint in work by IST Austria [Hen08], reported in Deliverable 15-(7.2)-Y1. The technical contribution of [Hen08] was to suggest how predictability can be formalized as a form of determinism, and robustness as a form of continuity. IST Austria, together with VERIMAG, continued the effort on studying robustness and predictability in embedded systems in Year 3, following several directions: • Hierarchical Timing Language (HTL) is a real-time coordination language for distributed control systems. • We extended our work on robust synthesis presented in D6-(3.1)-Y2 and D15-(7.2)-Y2 Component Modeling IST Austria, VERIMAG and TU Graz continued their work on robust synthesis, by developing a method for robust synthesis of components from high-level specifications in presence of liveness. IST Austria, together with EPFL and UC Santa Cruz studied concurrent and timed parity games. Resource Modeling IST Austria developed a flexible framework for cloud computing. IST Austria has pursued the work on transactional memory, a new paradigm for concurrent Programs. Quantitative Modeling IST Austria, CVF and ULB developed analysis and synthesis methods for quantitative systems, represented as mean-payoff and energy automata. IST Austria studied simulation distances as a way to capture a finer and more quantitative view of the relationship between boolean specifications and systems. IST Austria, together with CVF and VERIMAG, continued to study probabilistic systems, in particular, synthesis in presence of a probabilistic environment, the role of randomness in games and the qualitative analysis of the partially-observable Markov decision processes. Quantitative validation IST Austria continued its work in Year 3 on validation methods for transactional memories. IST Austria + VERIMAG worked on analog extensions of SystemVerilog assertions, as part of a larger Accellera committee IST Austria+ Uni Salzburg continued their work on hierarchical-timing language and proposed a
TOTAL		**2,20**	
Partner 33 Univ Porto	WP01	1,50	Visit of Luis Almeida (UnivPorto) to Mallorca (travel to Mallorca in March) -- work on dependability in adaptive systems; joint work of UnivPorto, Aveiro and Malardalen -- work in the hierarchical scheduling
	WP02	0,40	Organization of the Artist Summer School in Morocco (travel to Rabat, Luis Almeida, Mario Sousa and Paulo Portugal); invited talks at McMaster University in Canada and at the Singapore Polytechnic.
	WP05	1,90	Further developments in the FTT-enabled switch, namely the implementation of a hierarchical scheduling framework (participation in CRTS 2010, within RTSS 2010, San Diego); development of utilization-based schedulability tests for systems with release jitter (participation in SEUS 2010); analysis of the temporal behavior of COTS IP protocol stacks within standard OSs.
	WP07	1,00	Development and analysis of adaptive mechanisms in hierarchically scheduled Ethernet switches, in beacon management for target tracking sensor networks and in real-time wireless communication for teams of robots. Co-organization of the WARM workshop in CPSWEEK (travel to Stockholm)
TOTAL		**4,80**	
Partner 34 TRENTO	WP01	2,60	Travel expenses: participation to Artist Review in Brussels. Work on COSI, Metropolis and Metro II, UMTS
	WP03	2,68	Multiviewpoint modeling, meta-models, modal interfaces, heterogeneous composition, modular HTL, CAN response time
	WP07	1,00	Organization of GREEMBED and IWBDA
TOTAL		**6,28**	

8. Financial statements – Form C and Summary financial report

A separate financial statement from each beneficiary (FormC) is available on NEF.

A summary financial report which consolidates the claimed Community contribution of all the beneficiaries is provided here:

Cost declared Year 3	RTD	demo	MGT	OTHERS	TOTAL		MAX EC
1 FLORALIS	0		31 971	152 571	184 542		184 542
2 UJF/Verimag	333 849		32 570	82 263	448 682		365 220
3 Aachen	19 146		0	0	19 146		14 360
4 Aalborg	93 384		0	10 862	104 246		57 554
5 Aveiro	0		0	0	0		0
6 Bologna	36 254		0	0	36 254		27 191
7 TUBS	29 440		0	0	29 440		22 080
8 Cantabria	53 344		0	0	53 344		26 672
9 CEA	27 374		0	2 500	29 874		23 031
10 DTU	60 527		0	13 239	73 766		43 503
11 Dortmund	110 083		0	-1 085	108 998		81 477
12 EPFL	13 697		0	0	13 697		10 273
13 ESI	17 080		0	0	17 080		12 810
14 ETH Zurich	111 068		0	0	111 068		83 301
15 IMEC	123 235		0	0	123 235		92 426
16 INRIA	26 803		0	5 595	32 398		25 697
17 TUKL	5 387		0	0	5 387		4 040
18 KTH	62 537		0	13 917	76 454		60 820
19 Linköping	40 756		0	0	40 756		30 567
20 ULund	9 873		0	0	9 873		7 405
21 MDH	44 112		0	3 000	47 112		36 084
22 OFFIS	21 879		0	0	21 879		16 409
23 Parades	0		0	0	0		0
24 Passau	3 913		0	0	3 913		2 935
25 SSSA-Pisa	48 312		0	600	48 912		36 834
26 Porto	24 640		0	869	25 509		19 349
27 Saarland	55 112		0	0	55 112		41 334
28 PLU-Salzburg	39 838		0	3 000	42 838		32 879
29 Uppsala	55 470		0	0	55 470		41 603
30 Vienna	39 129		1 184	0	40 313		30 531
31 York	45 454		0	0	45 454		34 091
32 IST AUSTRIA	27 329		0	4 820	32 149		25 317
33 UNIVPorto	46 206		0	3 155	49 361		37 810
34 TRENTO	41 081		0	0	41 081		30 811
total	**1 666 312**	**0**	**65 725**	**295 306**	**2 027 343**		**1 558 951**

Please note that Floralis received money from the registration on the ArtistDesign summer school 2010. It does not appear in the table above.

Details on other direct costs (mainly travel expenses) had been provided by some partners.
Floralis:

	Management / Other direct cost	
Frais d'hébergement 10	Hôtel Ibis Brussels L. PEREIRA du 11 au 13/02/10 2 nuits	-266,00
Frais d'hébergement 10	Facture n° 335 Hôtel IBIS 11/02 (meeting rooms)	-1 689,80
Frais d'hébergement 10	Facture n° 397 Hôtel Novotel11/02 (salles)	-450,00
Frais de déplacement 10	Billet de train L. PEREIRA 13/02/10 - Retour Bruxelles	-109,10
Frais de déplacement 10	Billet de train O. GUERARD 9/02/10 - Aller Paris Bruxelles	-88,00
Frais de déplacement 10	Frais de déplacement L.PEREIRA - Bruxelles - Fév 10	-60,17
Frais de déplacement 10	Frais de déplacement O.GUERARD - Bruxelles - Fev 10	-18,54
Frais de déplacement 10	Remboursement B.BOUYSSOUNOUSE - Photocop Artist Design- Fev 10	-21,00
Frais d'hébergement 10	Facture proforma NOVOTEL arrhes 30%	-210,00
	OTHER / Other direct cost	
Frais de déplacement 10	Frais de déplacement Ayal ZAKS - Hôtel + taxi + Bus (+11,50 frais bqe)	-438,83
Frais d'hébergement 10	Fact selectour n° 30502288 Billet d'avion I. PERSEIL - Londres	-332,64
Frais d'hébergement 10	Facture Hôtel Institut n° 17737 Junival GARVIT	-56,87
Frais de déplacement 10	Fact selectour n° 30503794 Billet d'avion G. JUNIWAL Delhi-Lyon	-775,46
Frais de déplacement 10	Billet d'avion Easyjet B. JOBSTMANN - Bruxelles - 11-12/03/2010	-123,48
Frais de déplacement 10	Frais de déplacement Isabelle PERSEIL - Mission Brésil 09	-700,64
Frais de déplacement 10	Frais de déplacement B.JOBSTMANN - Mission Bruxelles - mars 10	-151,90
Frais de déplacement 10	Fact selectour n° 30512043 Billet avion F-J RAMMIG - PORTO ALLEGRE	-2 089,58
Frais de déplacement 10	Fact selectour n° 30509944 Billet avion T. ABDELZAHER - PORTO ALLEGRE	-1 362,62
Frais de déplacement 10	Fact selectour n° 30509383 Billet avion G. SASSATELLI - PORTO ALLEGRE	-2 686,74
Frais de déplacement 10	Fact selectour n° 30511509 Résa véhicule B. BOUYSSOUNOUSE San Francisco	-296,23
Frais de déplacement 10	Frais de déplacement I.PERSEIL - Mission Londres - mars 10	-867,09
Frais de déplacement 10	Fact selectour n° 30512388 Billet d'avion Y MONTEVIDEO-PORTO ALEGRE	-425,42
Frais de déplacement 10	Frais de déplacement Sergio YOVINE - Brésil - mai 10	-1 678,79
Achat de prestation 10	Facture DATE on behalf EDAA n°4066	-5 000,00
Achat de prestation 10	Facture n° 2010-FCLI-0000130 PLANNING Congressi	-2 000,00
Achat de prestation 10	Facture n° 0911020 Axome (migration du site ArtistDesign)	-2 675,00
Inscription congrès 10	Facture UBI FRANCE n° 1004483	-464,00
Inscription congrès 10	fac 2010/261 Minalogic participation ESC B.BOUYSSOUNOUSE	-1 950,00
Frais de déplacement 10	Billet d'avion Nikil DUTT - Los Angeles/Geneve - 8-11/9/10	-748,68
Frais de déplacement 10	Billet VFD Geneve-Grenoble AR Nikil DUTT - 8-11/9/10	-71,20
Frais de déplacement 10	Fact selectour n° 30518773 Billet d'avion A. WASOWSKI -	-917,06
Frais de déplacement 10	Fact selectour n° 30519222 Billet d'avion A. WASOWSKI - WARSAW-PARIS	-445,49
Avoir sur facture n°	Avoir n° 39237614 sur facture n° 30518773	482,49
Frais de déplacement 10	Fact.Selectour n°30519127 Billet avion PERSEIL Paris/Shanghai (annulé)	-951,16
Frais de déplacement 10	Fact selectour n° 30522045 Billet d'avion modifié I. PERSEIL - SHANGHAI	-1 083,28
Frais de déplacement 10	Frais de déplacement C.PALAMIDESSI - Avion Paris/NYC AR - mai 10	-732,83
Frais de déplacement 10	Frais de déplacement B.BOUYSSOUNOUSE - Mission San Francisco - avril	-1 403,57
Frais de déplacement 10	Frais de déplacement A.WASOWSKI -Mission Paris Hôtel + métro	-206,28
Achat Matériel 10	Facture CWI n° 60100049 Dr APT	-649,29
Achat Matériel 10	Facture n° 10040326 Imprimerie des Ecureuils	-438,00
Achat Matériel 10	Facture n° FA2010090004 - CHATEAU SASSENAGE	-6 900,00
Achat Matériel 10	Facture n° G000249- LE TELEPHERIQUE (acompte)	-1 421,80
Achat Matériel 10	Facture G000287 - LE TELEPHERIQUE (solde)	-713,89
Achat Matériel 10	Facture n° G012822 - La fine fourchette	-229,50
Frais d'hébergement 10	Facture n° 18358 - L'escandille (solde)	-46 706,07
Frais repas TVA 5,5 10	Facture n°5 La ferme de Martine et François	-1 400,00
Frais repas TVA à 19,6 10	Facture n°8 Le banc de l'Ours	-1 197,13
Achat de prestation 10	Facture Sapho Agence n° 10-2021	-137,50
Achat de prestation 10	Facture ZIK LA BOOM	-1 250,00
Achat de prestation 10	Facture n° 25.10.09.12004 - Aéroports de Lyon	-311,50
Frais de déplacement 10	Facture n° 00000117 ALTITUDE TAXI	-440,76
Frais de déplacement 10	Facture n° 00000116 ALTITUDE TAXI	-791,47
Achat Matériel 10	Facture n° 003 - IMAVOX	-8 000,00
Achat de prestation 10	Facture n° 004 - IMAVOX	-10 625,00
Achat de prestation 10	Facture n° 004b - IMAVOX	-750,00
Achat Matériel 10	Facture n° 201001545 Grenoble Tourisme et congrés	-50,00
Achat Matériel 10	Facture n° 10090761 - Imprimerie des Ecureuils	-165,00
Achat de prestation 10	Facture SICURO EVENTS n° 2010-001/FLO-VER	-3 360,00
Achat de prestation 10	Facture n° 2010-002/FLO-VER SICURO EVENTS	-3 360,00
Achat de prestation 10	Facture SICURO EVENTS N° 2010-003/FLO-VER	-4 736,00
Frais de déplacement 10	Facture n° 2010090239 - PHILIBERT TRANSPORT	-4 824,64
Achat Matériel 10	Facture BIG People n° 6024782	-470,25
Achat de prestation 10	Facture Universiteit Leiden donation	-1 000,00
Achat de prestation 10	Facture Embedded Systems week n° ESW-10101	-6 000,00
Frais de déplacement 10	Facture selectour n° 30522999 Billet d'avion A. LEGAY -CHICAGO	-302,76
Frais de déplacement 10	Réservation hôtel ORANGE TREE GOLF RESORT Axel LEGAY	-281,25
Achat de prestation 10	Facture n° 50000813 - University of Malta	-3 000,00
Achat de prestation 10	Facture n° 249368 - RADISSON BLU (9950 NOK)	-1 223,37
Frais de déplacement 10	Frais de déplacement J.BEZIVIN - Mission Oslo - oct 10	-890,63
Frais de déplacement 10	Frais de déplacement D.BEYER - Mission Paris (avion+hôtel) - aout 10	-292,98
Achat Matériel 10	OMNIPRESS Fact 44572 et 44653 (= subvention conférence Mémo code)	-1 799,35
Achat Matériel 10	Claude MANSIOT - note Droit d'auteur (= subvention conférence Mémo cod	-60,00
Achat de prestation 10	GRENOBLE BASTILLE Fact TS2010/493 (= subvention Mémo code)	-110,05
Frais repas TVA à 19,6	CHEZ LE PER'GRAS Fact 2010/07/27/001C (= subvention Mémo code)	-2 729,95
Achat de prestation 10	CHEZ LE PER'GRAS Fact 2009/06/28/003C (= sub CAV)	-847,24
Achat de prestation 10	CHEZ LE PER'GRAS Fact 2009/06/26/001C (= sub CAV)	-1 006,69
Achat Matériel 09	Facture n°200901495 Grenoble tourisme & congres (sub CAV)	-160,00
Achat de prestation 10	Facture Grill Parisien (sub CAV)	-258,11
Achat de prestation 10	Facture n°41 Daniel Hybord (sub CAV)	-1 136,01
Achat de prestation 10	Facture F0906136 NUMERICA (sub CAV)	-696,00
Achat de prestation 10	Facture F0906148 NUMERICA (sub CAV)	-804,00
Frais de déplacement 10	Factures n°9061374 à 9061381 PHILIBERT (8x246.45€) Sub CAV	-1 971,60
Frais d'hébergement 10	Facture n°60180 Hotel des Alpes (Sub CAV)	-59,60

total OTHER (wp2) 2010	152 571 €
total MGT other direct costs	2 912 €

Cantabria:

1. Personnal Costs

People involved in the project	Hours per activity		Costs	
	RTD	Total	RTD	Total
Michael Gonzalez Harbour	107	107	4 557,90 €	4 557,90 €
Eugenio Villar Bonet	48	48	2 067,51 €	2 067,51 €
Julio Medina Pasaje	85	85	1 917,41 €	1 917,41 €
Patricia López Martínez	52	52	892,64 €	892,64 €
Laura Barros Bastante	24	24	387,14 €	387,14 €
Hector Pérez Tijero	40	40	619,98 €	619,98 €
		356	10 442,59 €	**10 442,59 €**

2. Other direct Costs   **22 896,59 €**

2.a Travel Costs

Person	Place	Dates	Description	Total
Michael González Harbour	Brussels (Belgium)	11-12/02/2010	2nd year Project Review	853,30 €
Michael González Harbour	Kaiserslautern (Germany)	04-05/03/2010	Project Meeting	816,46 €
Michael González Harbour	London (UK)	19-21/03/2010	ECRTS 2010	720,32 €
Eugenio Villar Bonet	Nuremberg (Alemania) & London (UK)	01-03/03/2010	Artemis Meetings	1 419,86 €
Patricia López Martínez	Valencia (Spain)	14-18/06/2010	ADA-EUROPE 2010	498,65 €
Hector Pérez Tijero	Valencia (Spain)	14-18/06/2010	ADA-EUROPE 2010	516,95 €
Daniel Medina Ortega	Grenoble (France)	05-10/09/2010	Artist Summer School 20	608,18 €
Mónica Puig- Pey	Grenoble (France)	05-10/09/2010	Artist Summer School 20	476,63 €
Laura Barros Bastante	Pisa (Italy)	14-18/06/2010	EUROLAB 2010	1 001,29 €
Ángela del Barrio	Pisa (Italy)	14-18/06/2010	EUROLAB 2010	945,57 €
Eugenio Villar Bonet	Roma (Italy)	09-10/06/2010	ARTEMIS-IA Meeting	906,84 €
Laura Barros Bastante	Bilbao (Spain)	13-16/09/2010	EFTA 2010	233,23 €
Patricia López Martínez	Lille (France)	01-03/09/2010	EUROMICRO	882,72 €
Patricia López Martínez	Bilbao (Spain)	13-16/09/2010	EFTA 2010	169,81 €
Julio Medina Pasaje	Minneapolis (USA)	19-27/06/2010	OMG Meeting	3 833,56 €
Julio Medina Pasaje	Brussels (Belgium)	06-09/07/2010	WATERS	1 269,87 €
Eugenio Villar Bonet	Gant(Belgium)	26-27/10/2010	ARTEMIS and ITEA 2Co-	1 121,83 €
Julio Medina Pasaje	San Diego & Santa Clara (USA)	26/11/2010-11/12/2010	CRTS and OMG	1 999,29 €

Total	18 274,36 €

2.b Other Costs

Person	Description	Total
Patricia López Martínez	ADA-EUROPE 2010 attendance fee	480,00 €
Julio Medina Pasaje	OMG Fee	412,23 €
Patrícia López Martínez	SEAA 2010 attendance fee	440,00 €
Hector Pérez Tijero	ADA-EUROPE 2010 attendance fee	480,00 €
Julio Medina Pasaje	ECRTS2010 attendance fee	660,00 €
Mónica Puig-Pey	ARTIST SUMMER 2010 attendance fee	430,00 €
Daniel Medina	ARTIST SUMMER 2010 attendance fee	430,00 €
Patricia López Martínez	ETFA 2010 attendance fee	645,00 €
Laura Barros Bastante	ETFA 2010 attendance fee	645,00 €

Total	4 622,23 €

ETHZ:

Date Invoice	Beneficiary	Text	Amount EUR	Text, who, when, where
10/02/2010	AirPlus International AG	Flight	1089,85	Travel, Clemens Moser, 17.01.10, Brussels
11/06/2010	VISECA Card Services SA	Flight	530,85	Travel, Iuliana Bacivarov, 14.06.10 Bologna
11/06/2010	VISECA Card Services SA	Summerschool	774,65	Summerschool, Iuliana Bacivarov, Bologna
07/07/2010	AirPlus International AG	Flight	1027,28	Travel, Lothar Thiele, 6.07.10, Brussels
12/07/2010	Schranzhofer Andreas	Railway	19,03	Travel, Andreas Schranzhofer, 5.07.10, Leuven
12/07/2010	Schranzhofer Andreas	Taxi/Bus	15,24	Travel, Andreas Schranzhofer, 5.07.10, Leuven
12/07/2010	Schranzhofer Andreas	Hotel	148,29	Travel, Andreas Schranzhofer, 5.07.10, Leuven
12/07/2010	Schranzhofer Andreas	Meals	66,19	Travel, Andreas Schranzhofer, 5.07.10, Leuven
12/07/2010	VISECA Card Services SA	Hotel	275,41	Travel, Andreas Schranzhofer, 5.07.10, Leuven
16/07/2010	Thiele Lothar	Railway	6,26	Travel, Lothar Thiele, 6.07.10, Leuven
16/07/2010	Thiele Lothar	Taxi/Bus	63,38	Travel, Lothar Thiele, 6.07.10, Leuven
10/09/2010	VISECA Card Services SA	Conference	799,24	Travel, Iuliana Bacivarov, 24.10.10, Louisville
13/09/2010	Schranzhofer Andreas	Car rental	436,10	Travel, Andreas Schranzhofer, 5.09.10, Autrans
13/09/2010	Schranzhofer Andreas	Parking fee	32,89	Travel, Andreas Schranzhofer, 5.09.10, Autrans
05/10/2010	Pratyush Kumar Pratyush Ku	Railway	71,08	Travel, Pratyush Kumar, 4.09.10, Autrans/Grenoble
05/10/2010	Chokshi Devesh Bharatkuma	Railway	71,08	Travel, Devesh Chokshi, 4.09.10, Autrans/Grenoble
06/10/2010	Yang Hoeseok	Flight	262,33	Travel, Hoeseok Yang, 20.09.10, Braunschweig
06/10/2010	Yang Hoeseok	Railway	13,00	Travel, Hoeseok Yang, 20.09.10, Braunschweig
06/10/2010	Yang Hoeseok	Taxi/Bus	120,02	Travel, Hoeseok Yang, 20.09.10, Braunschweig
06/10/2010	Yang Hoeseok	Meals	58,04	Travel, Hoeseok Yang, 20.09.10, Braunschweig
07/10/2010	Bacivarov Iuliana Beatrice	Flight	1346,17	Travel, Iuliana Bacivarov, 5.07.10, Leuven
07/10/2010	Bacivarov Iuliana Beatrice	Railway	18,77	Travel, Iuliana Bacivarov, 5.07.10, Leuven
07/10/2010	Bacivarov Iuliana Beatrice	Hotel	296,83	Travel, Iuliana Bacivarov, 5.07.10, Leuven
07/10/2010	Bacivarov Iuliana Beatrice	Meals	66,19	Travel, Iuliana Bacivarov, 5.07.10, Leuven
07/10/2010	Bacivarov Iuliana Beatrice	Flight	21,98	Travel, Iuliana Bacivarov, 14.06.10, Bologna
07/10/2010	Bacivarov Iuliana Beatrice	Railway	5,62	Travel, Iuliana Bacivarov, 14.06.10, Bologna
07/10/2010	Bacivarov Iuliana Beatrice	Taxi/Bus	29,68	Travel, Iuliana Bacivarov, 14.06.10, Bologna
07/10/2010	Bacivarov Iuliana Beatrice	Hotel	124,51	Travel, Iuliana Bacivarov, 14.06.10, Bologna
07/10/2010	Bacivarov Iuliana Beatrice	Meals	132,37	Travel, Iuliana Bacivarov, 14.06.10, Bologna
11/10/2010	Bacivarov Iuliana Beatrice	Railway	174,09	Travel, Iuliana Bacivarov, 27.06.10, St.Goar
11/10/2010	Bacivarov Iuliana Beatrice	Taxi/Bus	8,34	Travel, Iuliana Bacivarov, 27.06.10, St.Goar
11/10/2010	Bacivarov Iuliana Beatrice	Hotel	729,80	Travel, Iuliana Bacivarov, 27.06.10, St.Goar
11/10/2010	Bacivarov Iuliana Beatrice	Meals	110,31	Travel, Iuliana Bacivarov, 27.06.10, St.Goar
09/12/2010	Bacivarov Iuliana Beatrice	Railway	21,16	Travel, Iuliana Bacivarov, 29.08.10, Leiden
09/12/2010	Bacivarov Iuliana Beatrice	Taxi/Bus	19,92	Travel, Iuliana Bacivarov, 29.08.10, Leiden
09/12/2010	Bacivarov Iuliana Beatrice	Meals	401,52	Travel, Iuliana Bacivarov, 29.08.10, Leiden

PASSAU:

PARTICIPATIONS AND PRESENTATIONS:

Christian Lengauer: participation in ArtistDesign Year 2 Review, Brussels, 11-12 February 2010

Christian Lengauer: Participation in 3rd Workshop on Mapping of Applications to MPSoCs, St. Goar, 29-30 June 2010

Christian Lengauer: Participation in Euro-Par 2010, Ischia, 30 August-3 September 2010, Chair of the steering committee (not billed to ArtistDesign)

Armin Größlinger: "Putting Automatic Polyhedral Compilation for GPGPUs to Work", 15th Workshop on Compilers for Parallel Computing, Vienna, 7-9 July 2010 (not billed to ArtistDesign)

Armin Größlinger: Participation in ARTIST Summer School in Europe 2010, Grenoble, 5-10 September 2010

York:

Trans.date	Text	Amount	Account(T)	Supplier Customer(T)
4 janv 10	Davis to Dagstuhl	290,26	Overseas Travel - Air	NYS CORPORATE
13 janv 10	Flight to Boston ARG meeting	582,70	Overseas Travel - Air	NYS CORPORATE
15 janv 10	Griffin Barcelona computing	104,00	Overseas Travel - Other	NYS CORPORATE
15 janv 10	Griffin Barcelona computing	10,00	Overseas Travel - Other	NYS CORPORATE
18 janv 10	visitor	17,60	Subsistence Allowances	PROF ALAN BURNS
19 janv 10	BOSTON -ARG	110,22	Hotel Accommodation	PROF ALAN BURNS
19 janv 10	25 FEB 10 A BURNS YORK to HE	180,00	UK Travel - Rail	NYS CORPORATE
19 janv 10	25 FEB 10 A BURNS	1,00	UK Travel - Rail	NYS CORPORATE
20 janv 10	10 FEB 10 A BURNS YORK to LO	84,00	UK Travel - Rail	NYS CORPORATE
20 janv 10	10 FEB 10 A BURNS	2,00	UK Travel - Rail	NYS CORPORATE
29 janv 10	Griffin Barcelona computing	159,61	Overseas Travel - Air	NYS CORPORATE
4 févr 10	21 FEB 10 D GRIFFIN YORK to LE	20,80	UK Travel - Rail	NYS CORPORATE
4 févr 10	21 FEB 10 D GRIFFIN	1,00	UK Travel - Rail	NYS CORPORATE
15 févr 10	EXPENSES FEB 10	252,95	Hotel Accommodation	PROF ALAN BURNS
15 févr 10	EXPENSES FEB 10	3,06	Overseas Travel - Other	PROF ALAN BURNS
15 févr 10	EXPENSES FEB 10	80,73	Subsistence Allowances	PROF ALAN BURNS
15 févr 10	EXPENSES FEB 10	5,00	UK Travel - Vehicle Hire	PROF ALAN BURNS
22 févr 10	03 MAR 10 A BURNS	1,39	UK Travel - Rail	NYS CORPORATE
22 févr 10	03 MAR 10 A BURNS YORK to LC	84,00	UK Travel - Rail	NYS CORPORATE
23 févr 10	DAGSTIHL	186,28	Hotel Accommodation	DR ROB DAVIS
23 févr 10	DAGSTIHL	62,78	Overseas Travel - Other	DR ROB DAVIS
23 févr 10	DAGSTIHL	2,62	Subsistence Allowances	DR ROB DAVIS
23 févr 10	DAGSTIHL	33,71	Subsistence Allowances	DR ROB DAVIS
23 févr 10	DAGSTIHL	30,59	UK Travel - Other	DR ROB DAVIS
23 févr 10	DAGSTIHL	65,60	UK Travel - Staff Car Mileage	DR ROB DAVIS
24 févr 10	Burns meeting Germany	319,00	Overseas Travel - Other	NYS CORPORATE
24 févr 10	Burns meeting Germany	10,00	Overseas Travel - Other	NYS CORPORATE
5 mars 10	Bate CPS week	514,10	Overseas Travel - Air	NYS CORPORATE
5 mars 10	Audsley and Whitten CPS week	736,32	Overseas Travel - Air	NYS CORPORATE
9 mars 10	12 APR 10 I BATE YORK to MAN(	34,60	UK Travel - Rail	NYS CORPORATE
9 mars 10	12 APR 10 I BATE	0,39	UK Travel - Rail	NYS CORPORATE
9 mars 10	12 APR 10 I BATE	1,00	UK Travel - Rail	NYS CORPORATE
10 mars 10	Burns CPS week	224,10	Overseas Travel - Air	NYS CORPORATE
10 mars 10	11 APR 10 A BURNS	1,00	UK Travel - Rail	NYS CORPORATE
10 mars 10	11 APR 10 A BURNS YORK to MA	29,80	UK Travel - Rail	NYS CORPORATE
15 mars 10	BURNS - CPS	205,20	Hotel Accommodation	PROF ALAN BURNS
15 mars 10	BURNS - CPS	34,07	Subsistence Allowances	PROF ALAN BURNS
15 mars 10	BURNS - CPS	5,00	UK Travel - Vehicle Hire	PROF ALAN BURNS
19 mars 10	Griffin Barcelona computing	217,92	Hotel Accommodation	DAVID JACK GRIFFIN
19 mars 10	Griffin Barcelona computing	49,53	Overseas Travel - Other	DAVID JACK GRIFFIN
19 mars 10	Griffin Barcelona computing	70,81	Subsistence Allowances	DAVID JACK GRIFFIN
19 mars 10	Griffin Barcelona computing	2,50	UK Travel - Other	DAVID JACK GRIFFIN
24 mars 10	IEEE Bate	100,23	Subscriptions	BARCLAYCARD
24 mars 10	Audley and Whitten RTAS Reg	1 399,66	Conferences and Seminars Attended	BARCLAYCARD
29 mars 10	CPS week	359,40	Overseas Travel - Air	NYS CORPORATE
29 mars 10	Flights RTAS	289,69	Overseas Travel - Air	NYS CORPORATE
30 mars 10	Hoo Lin Rome visit	82,93	Overseas Travel - Air	NYS CORPORATE
30 mars 10	Hoo Lin Rome visit	97,08	Overseas Travel - Air	NYS CORPORATE
31 mars 10	24 MAY 10 I BATE	1,00	UK Travel - Rail	NYS CORPORATE
31 mars 10	24 MAY 10 I BATE YORK to MAN(	34,60	UK Travel - Rail	NYS CORPORATE
15 avr 10	Audlsey and Whitten to Brussels	69,00	Overseas Travel - Other	NYS CORPORATE
15 avr 10	Audlsey and Whitten to Brussels	10,00	Overseas Travel - Other	NYS CORPORATE
15 avr 10	Audlsey and Whitten to Brussels	69,00	Overseas Travel - Other	NYS CORPORATE
15 avr 10	Audlsey and Whitten to Brussels	10,00	Overseas Travel - Other	NYS CORPORATE
21 avr 10	RS students	369,14	Course	BARCLAYCARD
23 avr 10	BURNS - CSP week	321,91	Hotel Accommodation	PROF ALAN BURNS
23 avr 10	BURNS - CSP week	94,49	Overseas Travel - Other	PROF ALAN BURNS
23 avr 10	BURNS - CSP week	47,17	Subsistence Allowances	PROF ALAN BURNS
26 avr 10	23 JUN 10 T LIM MANCHESTER /	26,10	UK Travel - Rail	NYS CORPORATE
27 avr 10	EXPENSES - CSP week	442,11	Hotel Accommodation	IAIN BATE
27 avr 10	EXPENSES - CSP week	70,78	Overseas Travel - Other	IAIN BATE
27 avr 10	EXPENSES - CSP week	44,15	Subsistence Allowances	IAIN BATE
27 avr 10	EXPENSES - CSP week	14,00	UK Travel - Vehicle Hire	IAIN BATE
28 avr 10	03 MAY 10 N AUDSLEY - Edinburg	1,00	UK Travel - Rail	NYS CORPORATE
28 avr 10	03 MAY 10 N AUDSLEY YORK to	76,20	UK Travel - Rail	NYS CORPORATE
4 mai 10	04 MAY 10 N AUDSLEY YORK to	76,20	UK Travel - Rail	NYS CORPORATE
17 mai 10	EXPENSES - Audsley	16,10	UK Travel - Other	NEIL AUDSLEY
18 mai 10	PO 307328	-180,40	Overseas Travel - Air	NYS CORPORATE
21 mai 10	ECRTS Registrations	1 084,64	Conferences and Seminars Attended	BARCLAYCARD
2 juin 10	Thesis	139,40	Binding	YORK BOOKBINDING
2 juin 10	BATE - Stockholm meeting	481,67	Hotel Accommodation	IAIN BATE
2 juin 10	BATE - Stockholm meeting	59,18	Overseas Travel - Other	IAIN BATE
2 juin 10	BATE - Stockholm meeting	32,06	Subsistence Allowances	IAIN BATE
2 juin 10	BATE - Stockholm meeting	30,00	UK Travel - Vehicle Hire	IAIN BATE
11 juin 10	Audsley and Whitten CPS week	1,00	Conferences and Seminars Attended	UNIVERSITEIT GENT
11 juin 10	Audley and Whitten CPS	1,50	Hotel Accommodation	UNIVERSITEIT GENT
17 juin 10	05 JUL 10 J WHITHAM YORK to L	84,00	UK Travel - Rail	NYS CORPORATE
17 juin 10	05 JUL 10 N AUDSLEY YORK to L	84,00	UK Travel - Rail	NYS CORPORATE
19 juin 10	UNIVERSITEIT GENT ACACES D.(	344,89	Conferences and Seminars Attended	UNIVERSITEIT GENT
19 juin 10	UNIVERSITEIT GENT ACACES D.(	517,33	Hotel Accommodation	UNIVERSITEIT GENT
28 juin 10	ACACES, Barcelona	1 650,36	Conferences and Seminars Attended	BARCLAYCARD
28 juin 10	SUMMER SCHOOL - Venice	554,84	Hotel Accommodation	TIONG HOO LIM
28 juin 10	SUMMER SCHOOL	66,76	Overseas Travel - Other	TIONG HOO LIM
28 juin 10	SUMMER SCHOOL	69,18	Subsistence Allowances	TIONG HOO LIM
28 juin 10	SUMMER SCHOOL	13,00	Subsistence Allowances	TIONG HOO LIM
29 juin 10	SUMMER SCHOOL - Venice	50,00	UK Travel - Vehicle Hire	EBOR CARS
2 juil 10	Gary and Dave to Barcelona	364,10	Overseas Travel - Air	NYS CORPORATE
12 juil 10	MILEAGE - Stockholn visit	398,25	Hotel Accommodation	NEIL AUDSLEY
12 juil 10	MILEAGE	3,60	Subsistence Allowances	NEIL AUDSLEY
12 juil 10	MILEAGE	87,33	Subsistence Allowances	NEIL AUDSLEY
12 juil 10	MILEAGE	20,80	UK Travel - Staff Car Mileage	NEIL AUDSLEY
19 juil 10	BRUSSELS ECRTS	575,55	Hotel Accommodation	PROF ALAN BURNS
19 juil 10	BRUSSELS ECRTS	445,53	Subsistence Allowances	PROF ALAN BURNS
30 juil 10	BRUSSELS ECRTS	381,46	Hotel Accommodation	PROF ALAN BURNS
30 juil 10	BRUSSELS ECRTS	107,92	Overseas Travel - Other	PROF ALAN BURNS
30 juil 10	BRUSSELS ECRTS	6,29	Subsistence Allowances	PROF ALAN BURNS
30 juil 10	BRUSSELS ECRTS	5,60	UK Travel - Vehicle Hire	PROF ALAN BURNS
30 juil 10	BRUSSELS ECRTS	100,00	UK Travel - Vehicle Hire	PROF ALAN BURNS
4 août 10	MANCHESTER AIRPORT - 359487	73,00	Telephones/Fax	Bate
4 août 10	Manchester to Atlanta - 3571966	453,09	Overseas Travel - Air	Bate
4 août 10	Booking Fee - 3588411	11,75	Overseas Travel - Other	Bate
4 août 10	MANCHESTER AIRPORT - 359487	46,92	Subsistence Allowances	Bate
4 août 10	MANCHESTER AIRPORT - 359487	27,40	UK Travel - Fuel	Bate
4 août 10	MANCHESTER AIRPORT - 359487	478,78	UK Travel - Vehicle Hire	Bate
12 août 10	FLORALIS 2010 Sept 10 - Plumbrid	-789,00	Conferences and Seminars Attended	BARCLAYCARD
12 août 10	2009-10 Pd 12 REVERSAL - FLOR/	789,00	Conferences and Seminars Attended	BARCLAYCARD
26 août 10	Artist Summer School	10,00	Overseas Travel - Other	NYS CORPORATE
26 août 10	Artist Summer School	704,00	Overseas Travel - Other	NYS CORPORATE
26 août 10	04 SEP 10 G PLUMBRIDGE YORI	86,00	UK Travel - Rail	NYS CORPORATE
26 août 10	04 SEP 10 D GEORGE YORK to L	86,00	UK Travel - Rail	NYS CORPORATE
2 sept 10	RTNS - Burns and Davis	532,50	Overseas Travel - Air	NYS CORPORATE
24 sept 10	BATE	407,92	Conferences and Seminars Attended	IAIN BATE
28 sept 10	RTWS	188,03	Conferences and Seminars Attended	PROF ALAN BURNS
30 sept 10	RTNS - Burns and Davis	314,10	Overseas Travel - Air	NYS CORPORATE
30 sept 10	RTNS - Burns and Davis	314,10	Overseas Travel - Air	NYS CORPORATE
4 oct 10	PARIS	30,71	Overseas Travel - Other	DAVID OLIVER GEORGE
4 oct 10	FOOD	55,69	Subsistence Allowances	GARY PLUMRIDGE
4 oct 10	PARIS	24,04	Subsistence Allowances	DAVID OLIVER GEORGE
4 oct 10	PARIS	13,00	UK Travel - Vehicle Hire	DAVID OLIVER GEORGE
27 oct 10	Artist Summer School	195,73	Conferences and Seminars Attended	BARCLAYCARD
4 nov 10	13 NOV 10 I BATE HEATHROW l	88,05	UK Travel - Rail	NYS CORPORATE
5 nov 10	TRAVEL /EXPENSES - RTNS	199,81	Hotel Accommodation	DR ROB DAVIS
5 nov 10	TRAVEL /EXPENSES - RTNS	21,62	Overseas Travel - Other	DR ROB DAVIS
5 nov 10	TRAVEL /EXPENSES - RTNS	21,86	Overseas Travel - Other	DR ROB DAVIS
5 nov 10	TRAVEL /EXPENSES - RTNS	1,00	Subsistence Allowances	DR ROB DAVIS
5 nov 10	TRAVEL /EXPENSES - RTNS	26,00	UK Travel - Vehicle Hire	DR ROB DAVIS
8 nov 10	TRAVEL/EXPENSES - RTNS	4,65	Conferences and Seminars Attended	PROF ALAN BURNS
8 nov 10	TRAVEL/EXPENSES - RTNS	201,58	Hotel Accommodation	PROF ALAN BURNS
8 nov 10	PO 307331 N AUDSLEY AND J WH	-403,60	Overseas Travel - Air	NYS CORPORATE
8 nov 10	TRAVEL/EXPENSES - RTNS	24,56	Overseas Travel - Other	PROF ALAN BURNS
8 nov 10	TRAVEL/EXPENSES - RTNS	109,07	Subsistence Allowances	PROF ALAN BURNS
8 nov 10	TRAVEL/EXPENSES - RTNS	61,70	UK Travel - Vehicle Hire	PROF ALAN BURNS
6 déc 10	Burns, RTNS	309,00	Overseas Travel - Other	NYS CORPORATE
6 déc 10	Burns, RTNS	10,00	Overseas Travel - Other	NYS CORPORATE
6 déc 10	07 DEC 10 P CONMY LEEDS. to l	86,50	UK Travel - Rail	NYS CORPORATE
14 déc 10	EXPENSES for visit	288,13	Hotel Accommodation	DR PHILIPPA CONMY
14 déc 10	EXPENSES for visit	8,07	Overseas Travel - Other	DR PHILIPPA CONMY
14 déc 10	EXPENSES for visit	20,56	Subsistence Allowances	DR PHILIPPA CONMY
14 déc 10	EXPENSES for visit	10,00	UK Travel - Vehicle Hire	DR PHILIPPA CONMY
21 déc 10	EXPENSES for visit	50,00	UK Travel - Vehicle Hire	EBOR CARS

TUBS:

Ernst, Rolf	09/02/2010	Brüssel, 09.02.-12.02.2010, Projekttreffen Artist Design review meeting			
Schliecker, Simon	12/03/2010	Dresden, 08.03.-10.03.2010, DATE 2010 Konferenz und Vortrag			
Schliecker, Simon	08/07/2010	Brüssel-Leuwen, 05.07.-07.07.2010, Cluster-Meeting Projekt Besprechung			
Negrean, Mircea Florin	12/07/2010	Brüssel-Leuwen, 05.07.-07.07.2010, Cluster-Meeting Projekt Besprechung			
Neukirchner, Moritz	19/09/2010	Autrans, 05.09.-10.09.2010, Artist Summer School 2010			
Ernst, Rolf	15/09/2010	Autrans, 05.09.-09.09.2010, Artist Summer School 2010			

DTU:

Month	Participants	Purpose	Place	Cost DKK	Cost EUR
Jan	Jan Madsen	Review meeting	Brussels, B	5 069,09	681,19
Apr	Paul Pop	DATE 2009 Conference	Nice, F	22 251,03	2 990,13
Apr	Michael Reibel Boesen	ArtistDesign meeting: Design for adeptivity	Pisa, I	1 558,55	209,44
June	Jan Madsen	ArtistDesign meeting	Braunschweig, D	8 865,64	1 191,38
June	Aske Brekling	ArtistDesign meeting	Braunschweig, D	6 411,09	861,53
June	David Alexandre	Artist Design - Graduate Course on Advanced Topics in Embedded Systems	Lyngby, DK	4 210,94	565,87
June	Marius Mikucionis	ArtistDesign meeting: Advanced Topics ESE	Lyngby, DK	2 720,03	365,52
June	Theis Hjorth	ArtistDesign meeting: Advanced Topics ESE	Lyngby, DK	745,00	100,11
June	Aivo Anier	ArtistDesign meeting: Advanced Topics ESE	Lyngby, DK	2 711,00	364,31
June	Feng Zhou	ArtistDesign meeting: Advanced Topics ESE	Lyngby, DK	745,00	100,11
June	Tatiana Totskaya	ArtistDesign meeting: Advanced Topics ESE	Lyngby, DK	5 425,15	729,04
June	Jueri Vain	ArtistDesign meeting: Advanced Topics ESE	Lyngby, DK	7 545,14	1 013,93
June		Fortunen 22/6	Lyngby, DK	6 912,00	928,84
June	Per Larsen	Map2MPSoC	St. Goar, D	2 659,52	357,39
july	Jan Madsen	ArtistDesign Summer School - Beijing	Beijing, China	12 873,23	1 729,92
Aug	Jan Madsen	MPSoC 2009	Savannah, US	16 804,41	2 258,20
Oct	K. Chakrabarty	Visit by K. Chakrabarty	Lyngby, DK	3 549,50	476,99
Oct	Jan Madsen	Visit by K. Chakrabarty	Lyngby, DK	860,50	115,64
Oct	Jan Madsen	ESWeek 2009 Conference	Grenoble, F	3 824,00	513,87
Oct	Paul Pop	SEEC 2009 meeting	Trento, I	4 316,03	579,99
Total	Reported travel cost in the FORM C			120 056,85	16 133,42
	Other costs			9 109,02	1 224,08
	total			129 165,87	17 357,50

Registered in 2010

Month	Participants	Purpose	Place	Cost DKK	Cost EUR
Oct-09	Jan Madsen	Visit by K. Chakrabarty	Lyngby, DK	880,00	118,26
Oct-09	Jan Madsen	ESWEEK conference	Grenoble, F	9 585,19	1 288,07
Dec-09	Poul Pop	V. Izosimov Ph.d. defense	Linköping, S	1 782,24	239,50
2009	NWPT	NWPT Conference	Lyngby, DK	762,00	102,40
	NWPT	NWPT Conference	Lyngby, DK	17 160,00	2 305,99
	NWPT	NWPT Conference	Lyngby, DK	836,00	112,34
mar	Jan Madsen	ArtistDesign review meeting	Brussels, B	2 488,84	333,93
mar	Via Travel	ArtistDesign review meeting - Jan Madsen	Brussels, B	2 490,00	334,09
june	Jüri Vain	Advanced Topics in Embedded Systems	Lyngby, DK	1 147,12	153,91
june	Anton Cervin	Advanced Topics in Embedded Systems	Lyngby, DK	421,46	56,55
june	Michael R. Hansen	Advanced Topics in Embedded Systems	Lyngby, DK	1 211,20	162,51
june	Michael R. Hansen	Advanced Topics in Embedded Systems	Lyngby, DK	348,40	46,75
july	Via Travel	CPH-Brussels-CPH - Jan Madsen, Elena Maftei & Anders Tranberg-Hansen	Brussels, B	11 007,00	1 476,84
july	Via Travel	Jan Madsen - Nagano	Nagano, JPA	8 500,00	1 140,47
july	Anders Tranberg-Hansen	IMEC, Leuven	Leuven, B	1 482,10	198,86
july	Elena Maftei	IMEC, Leuven	Leuven, B	1 486,10	199,39
july	Jan Madsen	IMEC, Leuven	Leuven, B	2 148,09	288,21
july	Scandic Copehagen	Kokichi Futatsugi, Advanced Topics in Enmbedded Systems	Lyngby, DK	7 072,00	948,87
july	Scandic Copehagen	Anton Cervin, Advanced Topics in Enmbedded Systems	Lyngby, DK	884,00	118,61
aug	Via Travel	Jüri Vain, Advanced Topics in Enmbedded Systems	Lyngby, DK	2 336,00	313,43
aug	Hotel Eremitage	Jüri Vain, Advanced Topics in Enmbedded Systems	Lyngby, DK	1 768,00	237,22
july	Kokichi Futatsugi	Kokichi Futatsugi, Advanced Topics in Enmbedded Systems	Lyngby, DK	1 243,74	166,88
july	Jan Madsen	MPSoC'10	Nagoya, JPA	11 989,58	1 608,67
july	Kokichi Futatsugi	Kokichi Futatsugi, Advanced Topics in Enmbedded Systems	Lyngby, DK	711,08	95,41
oct	Via Travel	ESWEEK 2010	Phoenix, USA	4 735,50	635,37
dec	Jan Madsen	ESWEEK 2010	Phoenix, USA	5 940,14	797,00
dec	Domitian Tamas-Selicean	Artemis Brokerage Event	Barcelona, E	1 090,93	146,37
dec	Domitian Tamas-Selicean	Artemis Brokerage Event	Barcelona, E	3 491,15	468,42
Total	Reported travel cost in registered in 2010			104 997,86	14 094,30

9. Certificates

Floralis and UJF need to provide the Commission an audit certificate for this period, in accordance with Article II.4.4 of the Grant Agreement.

Please find a scanned copy of the FormC duly signed by the external auditor.

FP7 - Grant Agreement - Annex VI - Network of Excellence

Form C - Financial Statement [to be filled in by each beneficiary]

Project nr	214373	Funding scheme	Network of Excellence
Project Acronym	ArtistDesign		
Period from	01/01/2010	Is this an adjustment to a previous statement ?	No
To	31/12/2010		

Legal Name		Participant Identity Code	nn
Organisation short Name	Floralis	Beneficiary nr	

Funding % for RTD activities (A)	75%	If flat rate for indirect costs, specify %	60%

1- Declaration of eligible costs/lump sum/flat rate/scale of unit (in €)

	Type of Activity					
	RTD (A)	Demonstration (B)	Management (C)	Other (D)	TOTAL	(A+C+D)
Personnel costs	0,00		23 731,00			23731,00
Subcontracting						0,00
Other direct costs			7 912,00	152 571,00		155483,00
Indirect costs	0,00		5 328,00			6328,00
Lump sum/flat rate/scale of unit declared						0,00
Total	0,00	0,00	31 971,00	152 571,00		184542,00
Maximum EC contribution	0,00		31 971,00	152 571,00		184542,00
Requested EC contribution						184542,00

2- Declaration of receipts

Did you receive any financial transfers or contributions in kind, free of charge from third parties or did the project generate any income which could be considered a receipt according to Art.II.17 of the grant agreement ? — NO

If yes, please mention the amount (in €)

3- Declaration of interest yielded by the pre-financing (to be completed only by the coordinator)

Did the pre-financing you received generate any interest according to Art. II.19 ? — NO

If yes, please mention the amount (in €)

4. Certificate on the methodology

Do you declare average personnel costs according to Art. II.14.1 ? — NO

Is there a certificate on the methodology provided by an independent auditor and accepted by the Commission according to Art. II.4.4 ? — NO

Name of the auditor		Cost of the certificate (in €), if charged under this project	

5- Certificate on the financial statements

Is there a certificate on the financial statements provided by an independent auditor attached to this financial statement according to Art.II.4.4 ? — NO

Name of the auditor		Cost of the certificate (in €)	

6- Beneficiary's declaration on its honour

We declare on our honour that:
- the costs declared above are directly related to the resources used to attain the objectives of the project and fall within the definition of eligible costs specified in Articles II.14 and II.15 of the grant agreement, and, if relevant, Annex III and Article 7 (special clauses) of the grant agreement;

- the receipts declared above are the only financial transfers or contributions in kind, free of charge from third parties and the only income generated by the project which could be considered as receipts according to Art. II.17 of the grant agreement;

- the interest declared above is the only interest yielded by the pre-financing which falls within the definition of Art. II.19 of the grant agreement ;

- there is full supporting documentation to justify the information hereby declared. It will be made available at the request of the Commission and in the event of an audit by the Commission and/or by the Court of Auditors and/or their authorised representatives.

Beneficiary's Stamp	Name of the Person(s) Authorised to sign this Financial Statement
Conseils et Experts	CONSEILS EXPERTS SARL - EXPERT COMPTABLE
	Date & signature
113 rue des Alliés 38100 GRENOBLE Tél 04 76 23 96 66 Fax 04 76 23 96 67 RCS 432 122 773 00027 - APE 741 C	21/02/2011