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WP9: Communication and Dissemination

Del9.5.5 – OPAALS Newsletter – Issue 5

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Partners	All partners.
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Targets	All project partners, European Commission, Future Internet Enterprise Systems (FIInES) cluster projects and the general public.
Publications*	Link to newsletter delivered directly by email to primary audience; link for the public available on the home page of the OPAALS web site.
PhD Students*	Two: Niall Brennan (LSE), Mehita Iqani (LSE)
Outstanding features*	This newsletter incorporates a new format and look and feel for increased readability and navigation within the newsletter.
Disciplinary domains of authors*	Neil Rathbone, communications; Niall Brennan, social sciences; Mehita Iqani, social sciences; Paolo Dini, natural sciences; Anne English, computer sciences; Gerard Briscoe, computer sciences; Alastair Munro, natural sciences; Oxana Lapteva, Frauke Zeller, Margherita Sini, Pedro Bueso Guillen, Javier Val, social sciences; Ossi Nykänen, computer sciences; Lorena Rivera León, social sciences; Maha Shaikh, social sciences

The information marked with an asterisk () is provided in order to address Recommendation n. 4 from the Year 2 review report*



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Introduction

The fifth edition of the OPAALS newsletter is an electronic deliverable sent to recipients' email inboxes and is located at the following publicly accessible URL:

<http://opaals.org/website/newsletters/2009-07-01/index.html>

Besides the standard content of an editorial, feature articles, project developments, Work Package updates and (in this issue and the previous) a partner city profile, the format and look-and-feel of the newsletter have been updated in anticipation of the increased public-facing momentum of Phase III of the project.

Though the newsletter is best viewed in its online context, the following pages provide a printed representation of its format and content.



THE OPAL: ISSUE 5, 1ST JULY 2009

Phase III and Sustainability



As we enter the final phase of the OPAALS project it is a good time for reflection on what we have achieved so far, and what remains to be done.

First let us remind ourselves that the overall objective of OPAALS is to establish a research Network of Excellence in this critical and emerging area of Digital Ecosystems. There can be no doubt that we have amassed a collection of twenty partners from all over the world, representing an impressive breadth and depth of expertise in the disciplines that have to interact if we are to understand and develop Digital

Ecosystems. These partners also cover the dimension that runs from fundamental research through to market application. We have produced an impressive array of deliverables, papers and presentations.

But have we built a true Network of Excellence? I suspect that the answer is 'not quite'. While we interact in deep and complex ways, we are not yet quite a community with its own identity and a critical mass of interactions that has its own momentum outside of the OPAALS consortium. However, we are getting there. Several partners are self-funding from sources other than the Framework Programme, and we are about to launch the OPAALS version of Guigoh in anticipation of the full version of the Open Knowledge Space (OKS) that will replace the well used wiki with a multi-functional platform that is open to all DE researchers.

Our focus now has to be consolidation and sustainability so as to finish the OPAALS project with coherent outputs and launch an enduring network. This emphasis is a recommendation of the interim review in April which says to 'focus on building the bridges to make interdisciplinary collaboration possible and sustainable' and to accept that full coverage of functionality is something for later research. More external activity is also called for, and interaction with the Future Internet Enterprise System (FIInES) cluster of projects will be an important step towards this goal.

So we need now to pace ourselves for the final phase of OPAALS by working closely together to consolidate what we have, and to embed our work inextricably within the wider research community. The key facilitator in this will be the OKS. It provides us with a virtual space in which to interact internally and externally, building relationships and disseminating our knowledge. In many ways, the 'virtual' OKS will in fact be the 'physical' manifestation of the network. We now have just over 50 weeks to build the OKS into that dream.

Neil Rathbone

Image credit: [Liverpool John Moores University](#)

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Diary Dates

FIInES meeting

London, UK, 16 June 2009. See the conference [web site](#).

PIIKO Phase III Kick-off

Salzburg, Austria, 24 - 25 June 2009. Get more information [here](#).

Annual Review

London School of Economics, London, UK, 24 - 25 September 2009.

Next Edition of 'The Opal'

Issue 6: December 2009. Stay tuned!

Useful Links

[OPAALS Website](#)

[OKS Wiki](#)

[Work Packages](#)

[File Repository](#)

[OPAALS Version of Guigoh](#)

Interim Review Feedback

An interim review of the OPAALS projects took place 8 April 2009 in Brussels, Belgium. It began with introductory remarks by Florent Frederix. Next, Paolo Dini provided an overview of work since the previous review, particularly responses to its recommendations 1, 6 and 7, as well as general project developments.

The review then moved into presentations on the Integration Coordination Team (ICT), Algorithmic Metaphors and Representational State Transfer, spearheaded by Sotiris Moschoyiannis, which was followed by work done on Community Cloud Computing, Community Currency and Shared Infrastructure, led by Gerard Briscoe and Alexandros Marinos. Anne English followed with a presentation on the consortium's response to recommendation 5 (on the OKS), tasks specific to the ICT and the ongoing integration efforts of WPs 9 and 10.

Following Anne, Thomas Kurz discussed integration-specific efforts, namely testing, EveSIM simulation, SBVR development in the Guigoh platform and the upcoming Communication Workshop (see Diary Dates in the sidebar). Regarding the activities of WPs 6, 10, 11, 12, Regional and Socio-economic Integration, Social and Computer Science Discipline Integration, and digital ecosystem case studies within the consortium, Antonella Passani gave a compelling presentation, matched by incisive questions from the review committee.

The review then moved on to Digital Ecosystems Architecture and the OKS, particularly the Restful Transaction Model, presented and demonstrated by Paul Krause; a demonstration of Joint Transactions by Paulo Siqueira; and finally a demonstration of Decentralised Identity (*IdentityFlow*) by Mark McLaughlin. Following these compelling demos, Professor T.V. Prabhakar discussed the concept of Agropedia preceded by Miguel Vidal's illustration of Sirona's integration with the digital ecosystems platform and OSGI.

After lunch, Ilaria Lener and Louise Newton-Claire gave an overview of the project's financial and administrative status, including actual reporting and integration activity. This was followed by one final demo of recent work on EveSIM, given by Thomas Kurz.

To wrap-up the review, the efforts of WP1 on mathematical modelling, theoretical computing and experimental biology were presented by Gerard Briscoe and Paolo Dini. Gerard, Paolo and Jayanta Chatterjee then discussed Deliverable 12.1. Finally, Frauke Zeller gave a presentation on Phase III plans and objectives.

While the review was challenging, it brought forward some of the project's biggest hurdles and highlighted its most urgent next steps, the review committee's comments in general were positive; among them:

- The review was much better than previous ones
- The Computer Science and Social Science domains are quite good and appear to be sufficiently covered
- All around, there is visible progress on the OKS project, including:
- A diversified approach to combining Guigoh and Sirona
- Decent project management
- However, integrated (downloadable) software must be available by the next review
- Communications within the consortium should be improved
- Training curricula and sustainable case studies should be formulated
- Community Cloud Computing should not be pursued within the scope of OPAALS, in order to conserve the project's identity and focus

As far as Phase III plans go:

- In general, plans are sound, although early for full feedback
- Reviewers asked for minor modifications that make sense and are easily implemented
- The next review will take place in September 2009 (stay tuned!)

Overall, the presentations were excellent: the ICT did a fantastic job, both during the preparation as well as during the review itself. Our partners from India and Brazil came in force and showed strong support. In fact, all the partners showed wonderful support, both during the weeks of preparation, and in being there to speak up at critically important points. The review atmosphere was difficult at times, and we had to do some work to clarify the vision of WP1 and how the theoretical integration is coming together in very interesting ways. The OKS discussion was also a challenge at times, but the review panel accepted that the approach we followed makes the most sense. In particular, the work of Gerard Briscoe was extremely effective in presenting complex ideas with effective illustrations that kept the review lively.

If you visit [our website](#) you will see several new links (on the home page and on the 'Our Research' page). These link to wiki pages that we have recently made public for anyone to browse. And this process will continue: we will be gradually open up big sections of the wiki, in preparation for the first launch of the Guigoh-based OKS in the next month or so. Please take a look also at our [India site](#); there is already some very nice 'clickable' material there!

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Profile: View from Kanpur

Home of OPAALS' Partner in India



Kanpur is home to the IITK, OPAALS only project partner in Asia, and research hub for everything associated with Digital Ecosystems in the context of agricultural knowledge exchange networks. Here are some facts you might not have known about the city:

Kanpur is the 5th largest and 9th most populous city in India, and is located in the northern state of Uttar Pradesh, which is bordered by country of Nepal to the Northeast, and the Indian state of Uttarakhand to the Northwest. Kanpur is an industrial and economically important city of approximately 1300 square km, and is situated on the banks of the River Ganges. Important goods produced in Kanpur include textiles and leather products, which are exported in bulk, as well as automotive products, flour, tea and steel. Due to its strength in industrial production, however, Kanpur suffers from a great deal of air pollution, congestion and overcrowding.

The Indian Institute of Technology Kanpur (IITK) is one of the city's most well known institutions. It was set up in 1960, and focuses on research in engineering and science. In the 1960s, the new university benefited from exchange programmes with nine leading US universities, including MIT, Berkeley and Princeton, which assisted in the setting up of research laboratories and academic programmes. Notable IITK alumni include Ashoke Sen, Shiraz Minwalla (both string theorists), N.R. Narayana Murthy (founder of Infosys) and Duvvuri Subbarao (current governor of the Indian Reserve Bank). As several other educational institutions are also based in Kanpur, it is considered an educational hub.

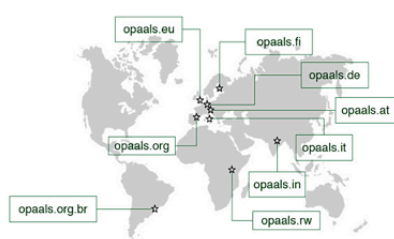
The most popular sport in Kanpur, like almost everywhere in India, is cricket. The local ground, Green Park, was constructed in 1945 and can seat almost 40,000 spectators. Although some bowlers might complain that its pitch is "lifeless", batsmen consider it a "paradise". Green Park was the ground in which Mohammad Azharuddin scored three of his career's most memorable test centuries: 122 against England in 1985, 199 against Sri Lanka in 1986 and 163 not out against South Africa in 1996.

Kanpur is also home to several archaeological and cultural heritage sites. Nearby Bithoor is a centre of Hindu pilgrimage, and is referred to in the Puranas as the site on which Brahma, the god of creation, commenced the project of creating the universe. A number of temples around Bithoor commemorate other key moments in Hindu belief. Kanpur is also home to one of the most popular zoos in North India - the Allen Forest Zoo, which houses a lush botanical garden, hundreds of deer, as well as tigers.

OPAALS Devolves Its Web Presence

When your web site can't be all things to all people what do you do? Simple. Devolve it to the community interests that it serves.

The web presence during Phases I and II was deliberately kept low-key as we did not have much to show in the early days, and we wanted to avoid lots of spurious enquiries, often from grant hunters, that consume valuable time.



As we enter Phase III that is to change as we are entering the phase of dissemination and wider external communication for which a web site is an essential tool. A series of events led the Project Coordinator to come up with the idea of devolving the web presence, so that partners can develop it along the lines that follow their specific interests.

Thus partners that service regional communities, such as IITK (profiled in this newsletter), can produce their own site with a regional URL that speaks the language of its audience,

both linguistically and metaphorically. Those that serve the research community will gather behind the .eu and .org domains hosted by a university partner and a commercial SME partner.

The sites will hopefully all contain deep linking to the other sites in the OPAALS family as well as to the OKS. This will provide a really rich experience for the visitor, who will be able to explore wherever their interest takes them. The process of devolution has already begun, and will be a strong and visible theme of Phase III.

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OPAALS Research Exchanges: Phase III Opportunities

The OPAALS Research Exchange programme was designed to support the development of the community by enabling researchers to visit other partner institutions for a period of time, and by basing themselves in a different intellectual and institutional environment, benefit from an exchange of ideas and cross-fertilisation of research. Researchers have chosen to visit OPAALS partners whose work is in some way related to the tasks and work packages in which they are involved, and where they might benefit from the presence of resources and new insights into their work. The programme of research exchange is based on the ability of the consortium to identify contiguous fields of research and institutions that can integrate their research activities. The programme aims to facilitate greater interaction between partners and higher integration of the different work packages of the project. To date, a dozen research exchanges have taken place, which have ranged between a week and three months in length.

Researchers are currently invited to apply for a Research Exchange for Phase III of the project. In order to do so, please contact [Gabriella Lombardo](#) with an indication of where you would like to go, the work plan that you would undertake whilst there, how long you would like to go for and when, and an indication of budget required. The work plan should include a timetable, a rationale for the exchange, reasons for choosing the host institution, a description of the focus of studies to be developed and mention of the targeted milestones/deliverables of the visit. Researchers are also encouraged to make contact with the intended host institution first, as a letter of invitation will be required.

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Abstracts of Submitted Deliverables Now Available



Abstracts of Submitted Deliverables

This page constitutes a dynamic (and growing) list of short abstracts for all submitted year. Deliverable authors are invited to edit these abstracts where necessary. All deliverables are available for download. Direct links to each deliverable appear after each abstract.

WP 1: Automata Theory and Autopoiesis

Year 1 Deliverables

A new resource is now available to the OPAALS community as well as the broader public: a collection of short summaries of all submitted deliverables.

This is available on the wiki as well as in Guigoh and is open for editing by any member of the OPAALS community. The summaries are organised by Work Package and Year. Each abstract provides a brief overview of the deliverable, and includes a link to the complete deliverable in PDF version, stored on the online repository.

The resource is useful as it allows researchers a quick and easy way to get up to speed on all work done in other domains and work packages, and essentially provides a "bird's-eye view" of all research completed in the project to date.

For more, click [here](#) to sign in to Guigoh, and then click on the "Community Documents" link. Or, have a look [here](#).

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Coming soon: 'Dissemination Storehouse'

The WP9 team is currently working on setting up a dynamic resource for all OPAALS community members. The dissemination storehouse will be a living, changing, up to date and relevant space in which opportunities and resources of interest to researchers in Digital Ecosystems are collated, shared and archived. It is intended to become a fundamental part of the OKS, and to be easily navigable by all users. It should have links to the shared calendar, where appropriate, and also be updateable by all users. It will be populated by the following kind of content:

Publications of interest

- New or recently published books (including digital versions where available)
- Journals relevant to digital ecosystems
- Links to articles or working papers of interest
- Relevant media articles and websites

Opportunities

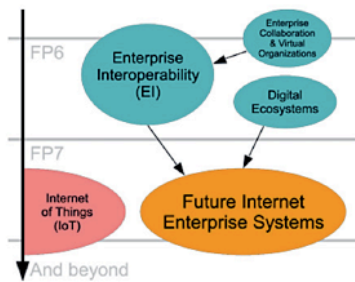
- Upcoming conferences, symposia, workshops relevant to DE (paper submissions or registration and attendance)
- Teaching or lecturing opportunities
- Media opportunities
- Publication opportunities (calls for book chapters, book proposals, journal articles)

A first version, populated with information collected by the WP 9 team, will be made available by Month 39 (August 2009). Once integrated with the OKS, it will be updateable by any OPAALS community member. Anyone with information that they might wish to include in the first version of the Dissemination Storehouse can send it to [Mehita Iqani](#).

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Articles

Digital Ecosystems Research to be Merged into Future Internet Enterprise Systems (FInES) Cluster



In its [7th Framework Programme \(FP7\)](#) the European Commission is reorganising its funding activities in the field of Information and Communication Technologies into a new cluster: Future Internet Enterprise Systems (FInES). This will unite the previous Enterprise Interoperability and Collaboration (EI) and Digital Ecosystems (DE) clusters. FInES will represent an integrated research focus that unites past and current concerns and focuses on the creation of increased opportunities for synergy and collaboration.

In her presentation at the first FInES cluster meeting in Brussels on 19 February 2009, Christina Martinez, European Commission

project officer and the head of the FInES cluster, explained that the vision of the research domain is to facilitate "the emergence of future business forms through research for networked organisations". She argued that this area of importance is contextualised by a vision of the "future internet context", which will define future ICT research, and characterised by: continuous and ubiquitous internet connectivity; the combination of material and immaterial tools (hardware and software integration); increasing demand for bandwidth, knowledge, services and user empowerment; and the diversity of continuously evolving ecosystems of enterprises. Martinez further articulated a vision of the future internet being future enterprise: the next generation of the internet will be defined by the ability to participate, a new wave of services will be hosted, and user-friendly technologies will empower the enterprise of the future. The internet will thus become a dynamic knowledge manipulation platform, and in turn lead to new ways of creating economic and social value. She highlighted the following key questions (among others) that will require attention in the context of FInES research priorities:

- How can the future internet be linked to new business scenarios?
- How can it be linked to open innovation?
- How can it be integrated with other dimensions, such as sustainability, energy conservation, economic crisis?
- How can costs be reduced and business processes optimised?
- How can it support competitiveness, support cooperation or create opportunities?

Paolo Dini, Andrea Nicolai and Paul Krause represented OPAALS at the Brussels FInES cluster meeting and outlined the project's objectives as developing a scientific foundation for digital ecosystems research, and building a sustainable community of research in the area of digital ecosystems. Participants at the cluster meeting were invited to contribute comments to a FInES cluster position paper: OPAALS comments (prepared by Paolo Dini) emphasised interdisciplinarity, the need for collaboration across academia, business, government, civil society and society at large, and the central importance of reflexivity. Furthermore, it highlighted the fruitful possibilities of applying both associative and systemic viewpoints to socio-technical questions, and provided links to OPAALS and DBE deliverables as reference material.

As the only Network of Excellence in the Digital Ecosystems cluster, OPAALS is uniquely positioned to contribute to the synergy and collaboration envisioned by FInES. The overall focus of the Digital Ecosystems Cluster was to foster endogenous local development, build local capacity and provide knowledge sharing processes and personalised ICT services to citizens and business networks. OPAALS, the only multi-disciplinary network of excellence in the former DE cluster focused on developing the science and technology behind Digital Ecosystems, will be able to make its findings and outputs available to future projects in the FInES cluster, thus contributing to the sustainability of research into the future of the internet.



The second FInES cluster meeting (above) took place in London on 16 June 2009. Paolo Dini, Neil Rathbone, Anne English and Mehita Iqani were in attendance, and participated in roundtable discussions reflecting on the FInES position paper (available [here](#)). This position paper will be updated based on the meeting and made available to the cluster community by the end of July. As well as this, Neil Rathbone volunteered to participate in a cluster wide Communications and Dissemination Task Force which will work towards improving communications within the cluster as well as from the cluster to other stakeholders. The next cluster meeting will take place in Brussels in the late Autumn (date to be determined) and will be hosted by OPAALS.

Image credit (top): From FInES Cluster [home page](#).

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The OKS

Recent months have been particularly exciting for the OPAALS OKS. Since the last newsletter and indeed especially since the interim review the pace has been picking up on the implementation the OKS collaboration tools.

While in the earlier part of Phase II, attentions were focussed on prioritising the development of OKS collaboration tools according to the requirements of the OPAALS community as our first target audience, the latter part saw the implementation of those tools begin. To this end and beginning in December 2008, we carried out an inventory of the tools available at that time and established a list of possible tools from TI and IPTI. This list of tools or features was then passed on to the OPAALS community members for prioritisation. On the basis of the feedback collected, IPTI and TI were then able to produce implementation roadmaps for the respective tools on both Guigoh and Sirona.

We then went on to initiate a testing and validation activity which was closed on May 18th to access achievements to date against these roadmaps. At the time of writing, the data garnered from this activity is being analysed.

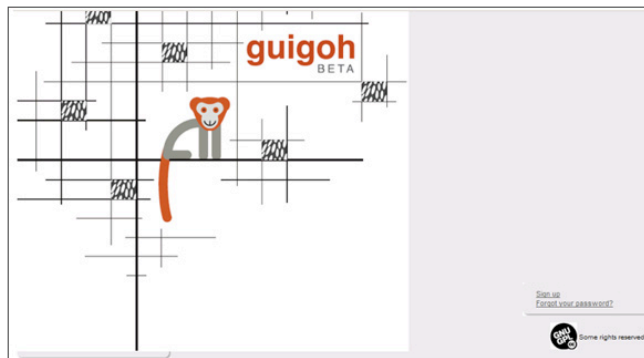


Figure 1: OKS Log-on

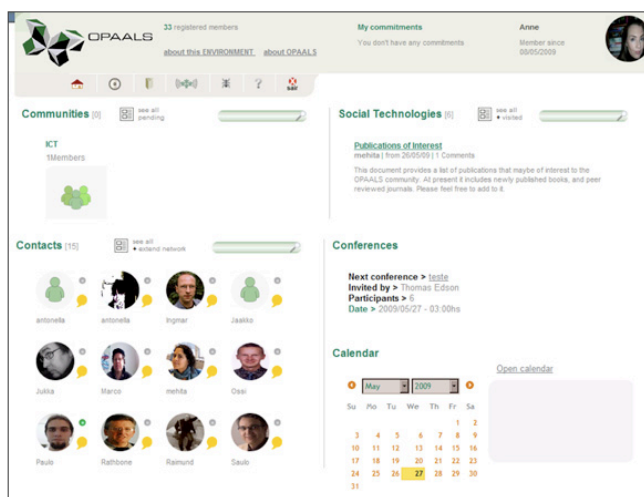


Figure 2: OKS Communities

Sirona (TI) continues to be available for use and most recently the OPAALS version of Guigoh (IPTI) has been launched under the domain name www.opaals.org.br following the launch of a pilot (RTS) for the Guigoh environment in Brazil. And in fact other partners are supporting the dissemination of this decentralised approach by registering their 'own' OPAALS domains in their home countries. This will help us on the road to attaining the critical mass that the OPAALS community requires for sustainability after the funded lifetime of the project.

Efforts initiated in Phase II to move existing collaborations onto the OKS as well as establish new collaborations on the OKS as tools become available will continue in Phase III. And the OPAALS community is now beginning to use the OPAALS version of Guigoh for day-to-day activities. For example, the ICT (Integration Collaboration Team) used Guigoh's chat tool to collaboratively define its task description and remit earlier this year. These continuing efforts to ramp up use of the OKS will be supported by WPs 9, 10 and the activities of ICT. This iterative, user requirements-led surveying, evaluation and implementation was welcomed by the PMB as it upholds accountability and transparency for the entire consortium and will help the OKS to build critical mass and survive in the ecosystem.

In the coming months, it is planned that the current functionality available in the OPAALS version of Guigoh such as chat, document editing, community and network establishment, calendar setting and so on will be accompanied by other functionalities such as VOIP, which we realise are key to our and other DE cluster members' geographically dispersed collaborations. Some of these tools can only be implemented in Phase III of the project being dependent on the P2P architecture and will be validation of the OKS functionality on the P2P architecture.

In tandem of course with the development of the OKS collaboration tools, the P2P infrastructure is being implemented by IPTI according to the design specifications from SURREY. The visualisation tools and transaction models are similarly being developed and integrated by TUT, IITK and WIT. (See WP10 update for more details)

We look forward to this next phase of the OPAALS NOE where we can see the endeavours of the last three years come to fruition and the OPAALS community can extend to support the knowledge and collaborations of the broader DE cluster community.

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Work Package News

WP1: The Status of WP1 Research at the End of Year 3 of OPAALS

In the last few months WP1 participants -- LSE, UNIVDUN, SUAS -- have focussed on the mathematical foundations of Bio-Computing and on continued experimental and theoretical work on the characterisation of the P53-MDM2 regulatory cycle of the cell.

In March Paolo gave four invited lectures at IITK on this topic, which can be found and a similar talk at the University of Passau in April. Together with Daniel Schreckling of the University of Passau, Paolo presented the paper "Distributed Online Evolution: An Algebraic Problem?" at the Congress on Evolutionary Computation (CEC2009) held in Trondheim, Norway, 18-21 May 2009.

The experimental work (Ingeborg van Leeuwen and Sonia Lain) has shifted its location from Dundee to the Karolinska Institute in Stockholm. Despite the move, we have been able to move forward with exploring the use of ordinary differential equations (ODEs) to model gene expression and biological control mechanisms. The rationale behind this approach is that we can use the insights from the ODE modelling to suggest, and perhaps corroborate, algebraic approaches to similar systems. Once we have robust algebraic models, this leads, reasonably logically, into the world of computer science and will enable the OPAALS project to apply biologically-inspired solutions to problems in computation and peer-to-peer networks.

We have encountered an interesting technical dilemma. There is a widespread belief that the system we primarily study (the tumour suppressor protein P53 and its regulatory partner MDM2) exhibits sustained undamped oscillations following external stress (ionising radiation). If true, this would have interesting consequences both biologically and algebraically. The proposition is that the oscillations act as a digital signal that will determine the fate of an individual cell: each oscillation acts as the tick of a digital clock, the number of ticks determines whether a cell is condemned to death or whether it is allowed the time to rest and repair the damage that has been inflicted upon it. Unfortunately, this elegant edifice rests upon only one experiment (not ours...) and our own work suggests that the unmapped oscillations may be an artefact introduced by the labelling procedures used to track protein production at the level of the individual cell. We have therefore concentrated our efforts, using a variety of different strategies, at resolving this important dilemma. Our results so far suggest that, whereas we can demonstrate damped oscillations in the P53/MDM2 system, we are unable to replicate the work that suggested that there might be undamped oscillation in this system. This distinction is of critical importance: damped oscillations are explicable by conventional modelling of negative feedback loops, undamped oscillations cannot be explained in this way and more elaborate modelling is required.

Thus, the realisation of the Bio-Computing vision requires a mathematical foundation. Cells and cell-like organisations abstracted from them 'compute' via multiple self-generated components in interaction with each other and with their environments. By mapping these mathematical properties to computer science constructions, we seek to enable the advancement of algorithms via their interaction, while rigorous mathematical abstractions from the dynamical stability and symmetries of living systems constrain and organise computation. Such internal structures and symmetries enable a smaller dependence on external, top-down and deterministic instructions and bring us one step closer to emergent computation. This is what we are calling Interaction Computing or Gene Expression Computing.

The weak point in the above argument is the model of interaction computing. What does it mean for two algorithms to 'interact'? What does it mean for two automata to interact? This will be addressed within WP1 during the final year of the project, in close collaboration with the new partner UH. By expressing the discrete properties of cell biology as computation primitives we will obtain the most faithful Bio-Computing model possible, which will necessarily also serve as the starting point for powerful new modelling frameworks for Computational Systems Biology. Thus, in essence we aim to achieve a total convergence of Bio-Computing with Computational Biology, because by so doing we will maximise the extent to which these two areas of application - and the two disciplines of cell biology and computer science - will learn from each other.

Our research programme in Bio-Computing is growing beyond OPAALS and involving other projects. We are attracting a growing number of research institutions and a significant amount of work is taking place in the BIONETS project. For example, of the three fundamental concepts of cell biology, Structure, Function, and Organisation, the first two are receiving more attention in BIONETS, whereas the third is being studied more in OPAALS. Whereas Structure is formalised most effectively through algebra, Function, and in particular symbiosis and multi-functionality, can be modelled most convincingly by systems of coupled non-linear differential equations. With the UNIVDUN and UH partners we are currently studying the possibility of relating these two aspects, as shown in the figure.

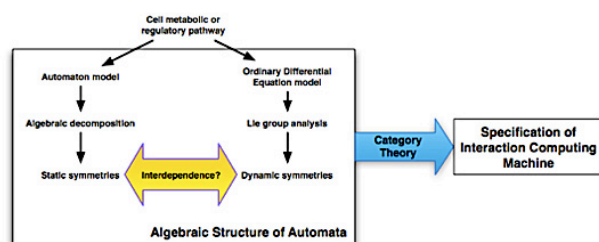


Figure 1: Structure and Function in cell biology

As Professor T.V. Prabhakar (IITK) pointed out, the concept of Organisation in biology maps to the concept of Architecture in computer science. This is the focus of Gerard's work in D1.3 and of Gerard and Prabhakar's WP1 work in Phase III of OPAALS, and will elucidate architectures for autopoietic computing. In addition, in collaboration with Sotiris Moschogiannis from SURREY, we are investigating the possibility of formalising the application of biologically-inspired architectural principles to large distributed systems and web environments through a biologically-inspired RESTful architectural style. This is one of the points of convergence between WP1 and WP3. The concept of Organisation in biology can be formalised through category theory. At the same time, category theory (more precisely universal coalgebra) can map any algebraic structure to a corresponding logic. In the BIONETS project we are therefore attempting to achieve this mapping starting from the algebraic structure of automata derived from metabolic pathways. In this manner we hope to close the circle between cell biology, software architecture, and the engineering specification of autopoietic software systems and environments.

One interesting, and unanticipated, result of exploration of biological sources for inspiring computer science has been our realisation that, when it comes to inspiration, it may not matter terribly much whether or not we have the correct biological explanation. When it comes to the provision of inspiration for computer scientists, it is the generation of potentially fruitful biological hypotheses that is important. The biological truth behind the hypothesis may matter somewhat less: as so often in life, it may be possible to generate a serviceable solution for all the wrong reasons.

Paolo Dini and Gerard Briscoe (LSE), Alastair Munro (UNIVDUN)

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WP6: Multilingual Search Assistant

Collaboration between different domains is always an intricate issue and subject to many discussions. Within WP6 -- partnered by UniKassel, ITA, UniZar, LSE, TUT, SUAS -- different tasks mirror the integrative and collaborative character of research.

The Metaphorological Tool Kit (MTK) as a research platform provides concrete examples and results of successful collaboration between researchers working in linguistics, social science and computer science. The scope of this research covers the following areas:

- linguistic analysis (e.g. metaphors, terminological work, methods and tools of natural language processing)
- social research of communities (integration of linguistic analysis into qualitative and quantitative research)
- and the collaborative research in computer science/engineering domain (e.g. formal representation of information based on linguistic analysis, metaphorical approaches in HCI and visualisation systems)

Another focus of the integrative research is the Evolutionary Framework for language. This work is based on the collaboration between UniKassel, TUT, and SUAS towards exploring the mechanisms and driving forces of natural language evolution and linking them to the research on Digital Ecosystems and Formal Knowledge Spaces. The mechanisms of language change and variation provide an important input for any system development in the context of its dynamic character, self-organisational aspects and evolution. The frequency-based approach of evolution reveals to occur not only in natural language systems. It can be found in networks (e.g. P2P) knowledge spaces and dynamic interfaces.

One of the further activities within Work Package 6 is the development of the Multilingual Search Assistant (Figure 1) performed by FAO.

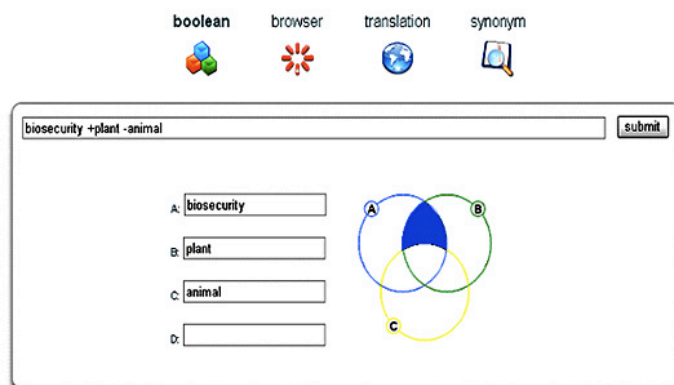


Figure 1: Multilingual Search Assistant Developments

The Multilingual Search Assistant (MSA) is an online wizard which helps users empowering their queries: if somebody is interested in "apples" the tool allows to identify more precise names to look for, such as "apple juice", "apple wines" or "crab apples". The navigations of more specific or more generic items (keywords) is done through alphabetical lists or a graphical representation of those keywords showing their connections.

The MSA tool allows also to expand a query: for example, for somebody interested in "tuna", the tool allows to search also for synonyms such as "tunny" or "albacore", or search the same expression in other languages, such as "barrilete" or "Atún palomida" in Spanish or "Atum-voador" in Portuguese.

Moreover, the easy-to-use graphical interface of the tool, allows for easy construction of logical searches. For example, a user interested in rice in India or Pakistan, can just enter these 3 mentioned keywords and the tool presents a graphical picture allowing for the selection of all the combinations of those keywords, for example "rice in India and rice in Pakistan" or "rice in India but not in Pakistan".

The tool is under development and will be soon released and incorporated in FAO web sites.

The research work carried out by ITA and UniZar has focused on the collection, analysis and systematisation of information about negotiation and contract processes in the Information Society Technologies (IST) Branch in Aragón (contracts from more than 15 IST SMEs have been collected and meetings have been held with all of them in order to collect all the needed details); and on the modelling of the content structure of IST-service contracts, which is primarily oriented towards a semantic description of contracts, aiming at creating ontologies as a basis for dynamic service composition. Furthermore, from the technical perspective, work has been conducted in the use case definition for dynamic service composition based on contracts, the analysis of standards for semantic contract definition and the infrastructure needed in order to publish, search and consume contract based services. It has been analysed how to discover a service with specific contract details, and a set of software tools to automate these processes have been created, and the feasibility to make dynamic service composition based on legal aspects based on the tools created has also been analysed. All tools are available [here](#).

Oxana Lapteva, Frauke Zeller, Margherita Sini, Pedro Bueso Guillen, Javier Val

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WP9: Cinderella Goes to the Ball

Phase III is where the Cinderella of WP9 (with partners LSE, T6 ECO, UNIS, TUT, IPTI, UL and TI) gets to go to the ball as the previously low-key activities are ramped up to provide more visible dissemination and wider external communication now that the project is reaching maturity.

Resources have been increased by acquiring more of Mehita Iqani's time and by recruiting Niall Brennan, which means that in total we now have the equivalent of one full time person working on WP9.

A big feature of the Phase III plan is the launch of the OKS and we will be working with the ICT providing some content and some encouragement in its use.

We will be generating articles and media releases, so are looking for interesting subjects from the partners and others.

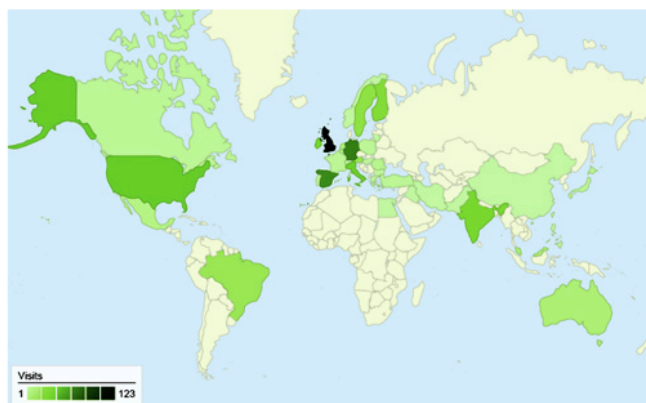


Figure 1: OPAALS' devolving web presence

The devolution of the web presence is featured elsewhere in this newsletter. We have also been monitoring web site traffic since January and have seen that around half our visitors appear to be first time users seeking general information about us.

Other tasks are progressing, including the article publication tool, experience exchange, and community enlargement.

The big bang at the end of the project may be a final public conference in Brazil in conjunction with a regional ICT event. Watch this space!

Neil Rathbone

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WP10: Visualisation System Developments

The current phase is interesting and challenging for WP10 participants -- TUT, IITK, SUAS, UniKassel, IPTI and WIT. Following the interim review, WP10 partners have been continuing to generate the deliverables due at the end of Phase II and to focus on ensuring that WP10 addresses the feedback from the reviewers at that review.

The following is a brief overview of some of those activities.

TUT: For the TUT team, work around the visualisation system development is proceeding.

Deliverable D10.11 - Specification of the P2P configuration of the visualisation system has been submitted.

Deliverable D10.12 - Component-based visualisation system with collaborative OKS core scenarios will be submitted to internal review by the end of May. You can find drafts of these deliverables as well as some images on the OPAALS wiki [here](#) and [here](#).

Phase III will focus more on end-user visualisation applications.

And the TUT Team is pleased to announce some recent publications:

1. Nykänen, O. 2009. Semantic Web for Evolutionary Peer-to-Peer Knowledge Space. In Birkenbihl, K., Quesada-Ruiz, E., & Priesca-Balbin, P. (Eds.) Monograph: Universal, Ubiquitous and Intelligent Web, UPGRADE, The European Journal for the Informatics Professional, Vol. X, Issue No. 1, February 2009, ISSN 1684-5285, CEPIS & Novática. Available [here](#).
2. Nykänen, O. 2009. Web Semántica para espacios de conocimiento evolutivos entre iguales. Monografía Web universal, ubicua e inteligente, Novática (En colaboración con UPGRADE), ISSN 0211-2124. See [here](#).
3. Huhtamäki, J., Nykänen, O., & Salonen, J. (2009). Catalysing the Development of a Conference Workspace. In HCI International 2009 Conference Proceedings, 19-24 July 2009, San Diego, CA, USA. Springer. To appear soon.

(Note: (2) is a Spanish translation of (1).)

IITK: IITK has been working on Task 10.15: Distributed Semantically Searchable Repository. Specifically, they have proposed an approach for distributed Lucene by distributing the indexes and data on the distributed platform. The proposed approach is outlined in the diagrams below.

We are also working on the approach to enhance a user query via query expansion techniques which adds related words in the user query, related words are searched from a knowledge model like wordnet, agrovoc rdfs documents:

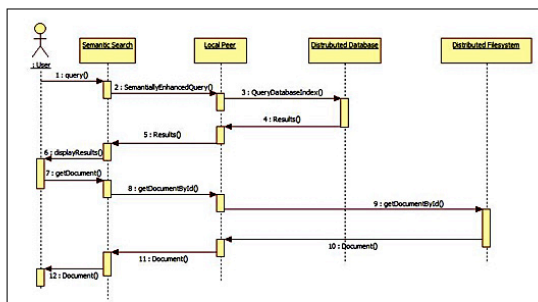


Figure 1: Proposed Search Sequence

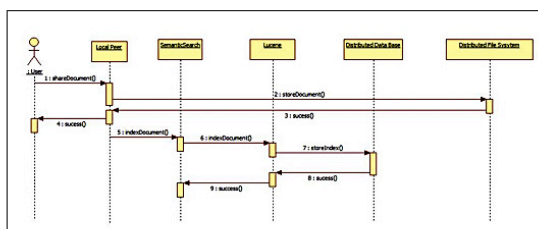


Figure 2: Proposed Index Sequence

SUAS: The SUAS team has been active in T3.8 and T10.11. Work on the EvESim is progressing well and they will show the latest version at the DEST conference. SUAS has also introduced visualisation capabilities for Google Earth and are working on the test and distribution of EvESim on different servers across the world now. They hope to implement this in IPTI, TUT and maybe in Ireland as well. While it is still running on Soapod currently, it will be migrated when IPTI has the alpha version of the service container ready at the end of July.

In addition, SUAS has received the first social network data from IITK generated from the agriculture project in India. This data is currently being analysed.

UniKassel: Currently the Kassel team is finalising D10.9 'Self-reflection of community building, communication and collaboration processes in the NoE'. This deliverable presents the results from the OPAALS survey and is an empirical view of the emergence of the OPAALS community. From those results, concrete recommendations for sustainable community building are drawn. Those recommendations will be made available to the whole community for further discussion.

IPTI: The RTS case study for Guigoh was officially launched on April 16th 2009 at the International Conference on Social Technologies. Work is now going ahead on the OPAALS version of Guigoh. A paper on this case study (RTS/OKS) has been accepted and will be presented during the [e-Challenges 2009 Conference](#), in Istanbul, Turkey, next November.

Guigoh currently has a lot of features, like community and relationship support, conferencing, document editing and others. Most recent efforts have been invested in fixing bugs and stabilising Guigoh for OPAALS usage. Also, in the near future, some features will be migrated to the peer-to-peer infrastructure that is currently being developed. The peer-to-peer, implementation according to Surrey's modelling is advancing well and will be available for services to be built on it in the next couple of months.

WIT: WIT is continuing to evaluate suitable available open source solutions for distributed file storage. Several candidates are available through the open source community. A full report of these will be provided early in Phase III.

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WP11: Bridging Digital Ecosystems Research to Regional Development and Innovation in the Knowledge Economy

During Phase III of the project, WP11 (with partners T6 ECO, IITK, NUIM, CAM, ITA) will be certainly at the front of the project research agenda. The focus of the WP will be on the concept of territorial deployment of Digital Ecosystems not only at the level of policies (that will remain a central element of the WP) but also taking in consideration the learning and participative process that are behind DEs deployment. This will support the process of building bridges to make interdisciplinary collaboration possible and sustainable and achieve community enlargement.

Phase III will be more practical in flavour. It will reinforce the process of experience exchange and collaboration among researchers working in projects concerned with local deployment, linking the OPAALS consortium to researchers, practitioners, development agencies and policymakers interested (and sometimes already involved) in DEs local deployment. The above effort will be capitalised through T11.9 that will consist of a comparative analysis and policy modelling exercise involving one new partner to the WP, [Create-Net](#); and two new partners to the OPAALS consortium: [National University of Rwanda](#) and [Ministério da Ciência e Tecnologia](#).

At the task level, partners have been extremely active in producing research outcomes. NUIM delivered M11.2 that highlights empirical material for a case study in the development of a biopharmaceutical against acute inflammatory diseases. The results of the remaining seven case studies by NUIM will follow in the next months. These will include a discussion on the implications for theory, as well as a discussion on how the study helps to understand sustainable DEs of SMEs and the contribution they could make to competitiveness of SMEs and regional development. CAM has continued its exceptional effort in disseminating the DEs concept in the Cambridge area, specifically in the fields of computer-technology, biotechnology and the eco-technologies. The partner also delivered M11.5 that focuses on the review, critique and evaluation of candidate methods of valuing innovations with commercial utility across two regions in the Cambridge area, which will also return feedbacks to the architects of DEs and the OKS and will therefore assist in the development of specifications. Work led by IITK has resulted in several Milestones towards three research papers/Deliverables focusing in the development of a theoretical framework for autopoiesis in the socio-digital space; the role of social informatics and social media in organising large scale social innovation; and the effect of intrinsic and extrinsic rewards on knowledge sharing behaviour in a Digital Ecosystem. D11.8 by T6 ECO focuses on the development of the DEs Impact Index (DEII) and its implications. The focus is in showing how WP11 case studies can transform into inputs for variables to be included in the DEII. Variables are introduced, described and discussed together with a selection of methodologies for data gathering. This is the first step towards the completion of an empirical tool for decision making related to DEs deployment at the local/regional level.

Finally, I am happy to announce the strong collaboration of the WP with the EUALKS international cooperation project between the EU and Latin America, financed by DG Research of the European Commission. Dr Paolo Dini and Lorena Rivera Leon will be moderating two Round table discussions on DEs in the conference [Latin American and European Perspectives on the Social Science - Policymaking Nexus in the Knowledge Society](#) next June 9th 2009 in Vienna, Austria. Other WP11 and OPAALS researchers such as Andrea Nicolai, Antonella Passani, Javier Val and Saulo Barreto, will also participate.

Lorena Rivera León

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WP12: Socio-economic Models for Digital Ecosystems

WP12 (with partners LSE, UL, CN, UniKassel, T6 ECO, IITK) is at an interesting juncture because it has found a number of links with WP11. The aim for the next phase is to work closer with other partners, but especially with WP11. The various tasks of WP12 cover a number of issues stemming from community currencies, governance and especially open source. A number of the cases focused on by WP11 allow us to use this case material to analyse with our own particular lenses of open source innovation, governance, community etc. The direction of WP12, to some degree in the open source area, is moving towards a community focus. In the last phase we were interested in commercial adoption of open source and various business models involved. We maintain this focus but it has shifted a little to also include the community and how the latter has embraced commercial interest in their products. Our aim is to get a more holistic understanding of open innovation, open-sourcing and the communities involved.

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