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PROJECT FINAL REPORT

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B.1 Final Publishable Summary Report

B.1.1 Executive Summary

Interoperability has been recognized as the key issue for achieving high productivity of Enterprises (especially SME's) and their information systems but also as the main driver for delivering effective pan-european electronic government services towards citizens and businesses. Promoted by the i2010 Strategy Framework and recently also by the Europe2020 as being a key area of the e-Government and e-Business European Commission research roadmaps, but also being a hot issue for all Governments of the 27 member states and the third countries, Interoperability is recognized as an inter-disciplinary research topic with high political and technological value.



The Greek Interoperability Centre (G.I.C.) is a Support Action project carried out under the "Research Potential" theme of the FP7 Capacities Programme with the aim to establishing a new research centre targeting e-Government and e-Business Interoperability Research, within the National Technical University of Athens. During the project duration, the goal has been to establish the Greek Interoperability Centre as a premium research centre in the field of Interoperability in Greece, cooperating with local universities across the Greek regions but also institutions from the Balkans and the Mediterranean - thus forming a strong regional pole of research and technology.

Towards this goal, the project has focused on:

- The creation of a **national research pole** of interoperability which cooperates with enterprises, governmental organizations and research centres, in order to achieve high quality interoperability research results.
- The **interaction and networking** with relevant organisations and research centres, at regional, European and international level, so as to mutually gain benefits, i.e. exchange experience and know-how, as well as communicate results and assist neighbouring countries in the region.
- The contribution of **multi-disciplinary research** on interoperability, tackling research challenges at organizational, semantic and technical level but also within various vertical thematic application domains (e.g. e-Government, e-Business, Network of the Future etc.).
- The contribution to **policy making and standardisation** in Greece and the EU, thus assisting the implementation of European Policies and interoperability - related initiatives.
- The creation of a new generation of **young and qualified researchers**, capable of tackling emerging interoperability issues in Businesses and Governments.
- The **active dissemination** of research results towards the scientific and business community in Greece, in the neighbouring countries, the EU and internationally.



B.1.2 Summary description of project context and objectives

B.1.2.1 Project Rationale

Nowadays, the shift of the traditional businesses and governments towards e-Business and e-Government models is inescapable – shifting accordingly the focus of management and information sciences. In order though to take full advantage of the opportunities promised by the envisaged new models of work and service provision, a number of research issues must be addressed with Interoperability having a key role.

Interoperability reaches all enterprises and governmental organizations at national and international level and constitutes a thriving research domain from all aspects – scientific, entrepreneurial, societal and political. Lack of interoperability appears as the most long lasting and challenging problem for enterprises and governmental organizations, a problem that has emerged from the proprietary development or extensions of applications, the unavailability or oversupply of standards, and the existence of heterogeneous hardware and software platforms. Legacy enterprise applications often hinder cooperation endeavours, since they require complex system integration efforts, while international research estimates claim that around 40% of system implementation budgets are spent on system integration with other (legacy) systems within an enterprise.

To meet their business objectives, enterprises and public organizations need to collaborate with other organizations: for many enterprises, doing business globally has become critical to their survival, while others (mainly governmental organizations and SMEs) discover new opportunities by focusing their business in a local setting. The situation has become more critical and important through new business paradigms like extended enterprises and networked organisations that require organizations to work together to achieve further benefits. Therefore, today an organization's competitiveness is to a large extent determined by its ability to seamlessly interoperate with others.

From a policy point of view, the importance of interoperability has been recognized and stressed in the EU policy framework (e.g. the i2010 Strategic Framework and more recently the Digital Agenda for Europe/Europe 2020 Strategy). Being the logical link between the high-level goals of the Lisbon Strategy and more operational ICT-related actions, the i2010 Framework has pointed out that "businesses are getting productivity gains from ICT but still face a lack of interoperability, reliability and security, difficulties to re-organise and integrate ICT into the workplace and high cost of support", and has thus explicitly identified interoperability as one of the key bottlenecks that should be tackled by i2010 in order to create a single European information space and make the European Union more competitive. On the other hand, the more recent Digital Agenda for Europe, a flagship initiative of the Europe 2020 Strategy, also highlights the importance of interoperability, as it identifies seven priority areas for action (1.Digital Single Market, 2.Interoperability and Standards, 3.Trust and Security, 4.Very Fast Internet 5.Research and innovation 6.Enhancing e-skills 6.ICT for Social Challenges), among which "Interoperability and Standards" focuses on the necessity for new IT devices, applications, data repositories and services to interact seamlessly anywhere and specifies improved standard-setting procedures and increased interoperability as the keys to success.

The importance of interoperability of organisations and systems has been furthermore recognised by the European Commission through the creation of the European

Interoperability Framework (EIF) and respective e-Business Interoperability Framework (eBIF) as evolving tools for guiding administrations and industries.

From the Greek viewpoint, the Greek Digital Strategy acknowledges interoperability as a core pillar towards the Information Society of 2013, while recent IDABC reports underpin this thesis by stating that interoperability is a vital issue in Greece, where there is a plethora of governmental organizations, citizens and enterprises that need to interact, though they do not have such a potential since in most cases they have been focused on their own requirements and have already defined their specific, inflexible information systems according to their own assumptions and interpretations. Throughout the recent years, the Greek Government has undertaken several projects for achieving an e-Government infrastructure the soonest possible -e.g. the e-Government Interoperability Framework (e-GIF), the National Governmental Portal (HERMES), the Greek e-Procurement System, the Ministries and Municipalities Portals and the back-office systems of the Districts and the Prefectures, and has allocated more than five billion Euros, originating from national funding schemes or the Community Support Frameworks (CSFs) to the modernization of the Public Administration, thus making the need for interoperability standards, research results and prototype implementations at national level as important as ever.

B.1.2.2 Project Objectives

In the above described context, where interoperability constitutes a key needed element for business and governments in the new electronic landscape, the Greek Interoperability Centre (G.I.C.) project vision has been to assist Enterprises and Public Administrations to co-operate efficiently and securely, based on open standards and IT-systems, in order to bridge organisational and technical borders. Towards materializing this vision, the project has gone after these objectives:

- The creation of a **national research pole** of interoperability which cooperates with enterprises, governmental organizations and research centres, in order to achieve high quality interoperability research results.
- The **interaction and networking** with relevant organisations and research centres, at regional, European and international level, so as to mutually gain benefits, i.e. exchange experience and know-how, as well as communicate results and assist neighbouring countries in the region.
- The contribution of **multi-disciplinary research** on interoperability, tackling research challenges at organizational, semantic and technical level but also within various vertical thematic application domains (e.g. e-Government, e-Business, Network of the Future etc.).
- The contribution to **policy making and standardisation** in Greece and the EU, thus assisting the implementation of European Policies and interoperability - related initiatives.
- The creation of a new generation of **young and qualified researchers**, capable of tackling emerging interoperability issues in Businesses and Governments.
- The **active dissemination** of research results towards the scientific and business community in Greece, in the neighbouring countries, the EU and internationally.

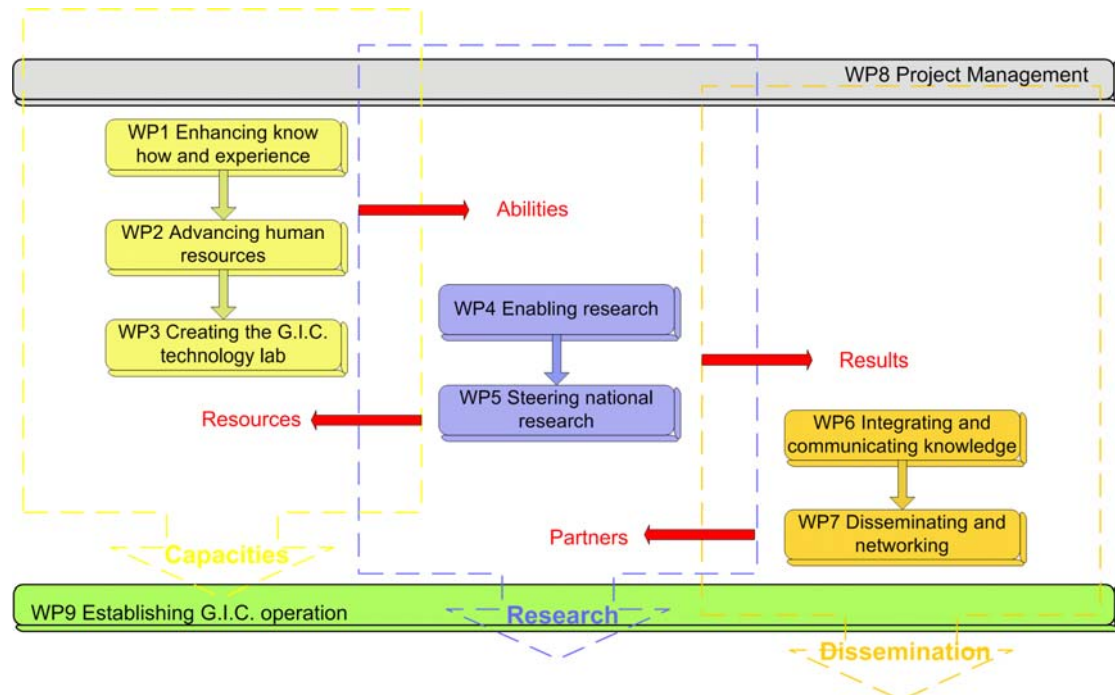
In order to pursue the above mentioned goals, a series of specific **individual objectives (IOs)** were set and the project's operational/working approach was determined as follows:

- **I.O.1. Enhancing human resources.** This has been achieved operationally through:

- The organization of short training sessions for young researchers with invited prominent experts and scientists in the interoperability domain on a regular basis.
 - The organization of short training visits for young researchers at acknowledged international research centres and organisations.
 - The implementation of trans-national secondments of research staff between G.I.C. and foremost research centres.
 - The recruitment of experienced, high-level managers and/or research staff as well as of promising young researchers with high academic credentials.
- **I.O.2. Strengthening research activities.** The operational approach to this objective has involved:
 - The preparation and participation in proposals for projects networks and other initiatives under FP7.
 - Cooperation with accredited international research centres in national projects.
 - Contribution to the work of well-established international research groups.
 - Participation to the standardisation procedure in the interoperability domain.
 - **I.O.3. Steering national research.** Relevant efforts in this area have focused on:
 - The creation of national pole of research centres and institutions in the domain of interoperability.
 - The alignment of national research priorities and implementation of Community Support Funds (CSFs) to the European guidelines and policy frameworks.
 - **I.O.4. Disseminating and creating exposure.** The individual operational goals encompassed:
 - Attracting worldwide attention and research interest in Greece.
 - Integrating and communicating knowledge and experience in the domain across the entire Greek region and Eastern European vicinity.
 - Networking with experts and scientists, research centres, governmental organisation and the industry.
 - Disseminating research results to international conferences, workshops, information days and events for interoperability.
 - **I.O.5. Establishing the operation of the Interoperability Centre.** Towards this goal, focus has been placed on:
 - Creating the technological environment of G.I.C. – capacities for conducting interoperability tests and running scenarios.
 - Providing support to governmental organisations and public authorities – best practises, technologies and solutions that have been tested, demonstrations, project management and training.
 - Providing support to the industry – migration of products and platforms to standard-conformant solutions, interoperability tests, consulting.

The aforementioned objectives have also been reflected in the project's methodological approach, according to which the required work efforts have been divided into three vertical, intersecting work groups, namely **Capacities**, **Research** and **Dissemination** and then further subdivided to specific work packages and dedicated tasks. The term intersecting signifies the synergy level between the work groups, as each work group has “fed” equally

the subsequent as well as the preceding one, in order to enable the project team to conduct even higher-quality work in them.



The first work group, entitled **“Capacities”** has aimed at strengthening the capacities of G.I.C. – regarding infrastructures and intellectual ability – so as to conduct high level research in the interoperability domain, and has been divided in three dedicated work packages, namely:

- WP1 Enhancing know how and experience
- WP2 Advancing human resources
- WP3 Creating the G.I.C. technology lab

The **“Research”** work group has been dedicated to conducting state of the art research in European level and organising and steering interoperability research and policy in national level, incorporating the following two work packages:

- WP4 Enabling research
- WP5 Steering national research

The third work group on **“Dissemination”** has focused on disseminating at international level and cultivating the reputation of G.I.C. as a premium European research centre in the domain of interoperability, encompassing two corresponding work packages:

- WP6 Integrating and communicating knowledge
- WP7 Disseminating and networking

The project work plan has been complemented by two horizontal work packages, i.e. **WP8 Establishing G.I.C. operation** and **WP9 Project management**, cross-cutting the vertical work groups and taking all the necessary provisions to homogenize the project's efforts towards its overall objective.

B.1.3 Main S&T results/foregrounds

The following paragraphs present the main S&T results and foregrounds of each project component, highlighting the specific working objectives considered and methodological approach carried out for this purpose.

B.1.3.1 Enhancing know how and experience

Objectives and Methodological Approach

The purpose of the project's component "Enhancing know how and experience" has been to strengthen the researchers' ability to conduct innovative research by enhancing their scientific background of knowledge and experience in order to constitute the basis for G.I.C.'s potential research staff. At the beginning of the project, the G.I.C. core team had already extensive experience and capacity level in various key fields of interoperability, acquired over the years through participating in significant interoperability projects, research activities and policy initiatives. Thus, the main aim of the Greek Interoperability Centre has been to methodologically train the members of the G.I.C. team and to extend and further enhance the expertise level of the research team by covering in a balanced and coordinated manner critical interoperability dimensions. The methodology to achieve this aim has been structured in fact along the following main axes:

- The organization of **short term training sessions with invited experts**, with the objective to enhance the researchers' know how and skills by enabling prominent scientists to visit the facilities and share their knowledge and experience;
- The participation of GIC's researchers in **structured targeted training events** organized by distinguished training/research actors on topics of the centre's interest;
- The organization of **short term training visits to international research centres**, with the goal to enhance the researchers' knowledge background as well as their overall scientific culture by bringing them in contact with state of the art facilities that conduct cutting edge research.

In this context, and towards achieving the above specific objectives, efforts throughout the project duration have focused on:

- identifying and systematically updating the training needs of the G.I.C. team of researchers and experts;
- identifying, contacting and establishing cooperation with distinguished experts on fields, critical for improving the capacity and knowledge level of the GIC researchers and experts;
- identifying, contacting and establishing cooperation with distinguished research centres and actors that conduct state of the art R&D activities on interoperability related fields;
- planning and implementing targeted training activities, e.g. training seminars, invited lectures, workshops, training visits according to the devised action plan and training needs analysis carried out and taking into consideration relevant technology and policy developments.

The training requirements analysis and the development of the training plan regarding the training seminars, activities and training visits have been based on a combined elaboration of the Interoperability Knowledge Map - I-KMap (a three dimension categorization of interoperability issues), the knowledge gathered from consulting research leading research centres and experts and a prioritization of the knowledge and expertise needs of the G.I.C.

Organising short term training sessions with invited experts

The project team has contacted along the project duration acknowledged experts and managers in the domain of interoperability, as well as in other relevant scientific fields, in order to organise a series of regular short-term training sessions in Greece. These experts have all been part of a broader list of prominent experts, scientists and researchers in the field, with whom NTUA collaborates in the scope of various national and international initiatives. The final selection was determined during the course of the project according to the training needs of the project team, the current status and evolutions of the interoperability research and the experts' availability at the time.

At the end of month 48 of the project, more than 60 national and international experts covering the various interoperability dimensions had been identified as main contributors to the training goals of the project in the following two forms of cooperation:

- either as trainers in 3 to 5 day training seminars organized by the Greek Interoperability Centre
- or as partners in ad-hoc training/dissemination activities, in which G.I.C. members participated to acquire know how and expertise on relevant interoperability issues.

Accordingly, **more than 20 training seminars and related activities** were organized or attended by G.I.C. members during the 4 years of the project duration, and mainly during the first half of the project. Indicative highlights of these activities include:

- interoperability training workshops on January 2009, (Oracle, Microsoft, ATC, ITEC, etc)
- seminar "Enterprise architecture for transformation", 29 June – 2 July 2009, Prof. Marijn Janssen TU Delft
- seminar "Web 2.0 and new governance models", July 2009, Dr. David Osimo, Tech 4i
- seminar "Semantic Interoperability and Ontology Modelling", July 2009, Michele Missikoff, CNR
- seminar "Practical aspects of Interoperability and standards". July 2009, Prof. Ricardo Jardim-Goncalves and Carlos Agostinho, UNINOVA.
- seminar "BPM Products and Services", November 2009, TREK consulting and Hypertech.
- Invited lecture "Moving towards Knowledge Digital Cities" - December 2009, Dr Tan Yigitcanlar, Queensland University of Technology, Brisbane, Australia.
- Training Seminar on the Microsoft Biztalk Server,
- seminar on Interoperability matters in the Greek Digital Strategy, November, 2010, Dr Yannis Larios, Digital Aid SA
- training workshop, "IT Pro & Dev Connections", November 2010, in Athens
- training workshop "Media Web Symposium", November 2010, Fraunhofer FOKUS
- workshops at the Infrastructures and Engineering (SSAIE) Summer School 2011.
- seminar (School of Interoperability) at the Hellenic Ministry of defence, held in Athens on February 2011
- Greek Interoperability Days 2008
- Greek Interoperability Days 2009
- Greek Interoperability Days 2010
- Greek Interoperability Days 2011

Organising short term training visits to international research centres

A number of research centres and institutes were identified in international, regional and national level and their research expertise was mapped against the scientific areas specified in the I-KMap. The criteria for choosing the following centres have been their collaboration with NTUA on a series of research projects, their participation in prominent research projects and initiatives in the interoperability domain and their worldwide acknowledgement by the scientific community and the industry as centres of excellence.

More than 20 international research centres have been identified throughout the course of the project as sharing G.I.C. research scope and training targets. A series of Greek and regional centres have also been identified, with which G.I.C. members have already established communication links on the ground of research as well as training cooperation initiatives.

In total, more than **10 organized training visits or ad hoc visits** to national and international centres took place along the project duration under the umbrella of the training component or that of the research and dissemination components, surpassing the target of 6 visits to be organized during the first half of the project. Indicative highlights of these visits include:

- A training visit to SAP Research, Campus-based Engineering Center (CEC) in Karlsruhe – Germany, during which G.I.C. researchers participated in a training workshop with senior SAP researchers/managers with a view to collaboratively elaborate on research issues of common interest and to discuss research orientations and objectives and co-operation prospects in the fields of: Service Modelling and Execution, Business Process Management, Semantics, Service Front-Ends, Software Engineering and Architectures.
- An organized mission to the US in August 2009, during which G.I.C. researchers visited Oracle Research Center, in the Corporation Headquarters in San Francisco, California, and Microsoft Research Centre in Redmond, Seattle. The visit to Oracle Research Center took the form of a training workshop on G.I.C. operations and Oracle's research initiatives and prospects under development with respect to Enterprise 2.0, Oracle Application Framework, Enterprise Modelling Suites and Business Applications, while during the Microsoft - G.I.C. workshop the two teams exchanged research ideas and outlook for future interoperability standards and services worldwide, in the area of electronic Government and electronic Business, covering topics such as Cloud Computing, Policy-making, e-Identity, Internet of Services, Internet of Things, Middleware Architectures, Open Source and Interoperability.
- Participation in the 2nd and 4th annual Summer Schools of the iGov Research Institute, held by the University at Albany (US) at the University of Salford, Manchester UK in July 2008 and at the Delft University of Technology, in the Hague, Netherlands in July 2010, during which G.I.C. researchers were engaged in both classroom and field activities for assessing the impact of ICT on the public sector and understanding the value of doing research in an international and multi-cultural context.

Additional research centres that G.I.C. researchers visited throughout the project duration include Fraunhofer Fokus, Institute for Open Communication Systems (Germany), Public-I Group Ltd (Brighton, UK), Vrije Universiteit Brussels STARLab (Belgium), KTH - SYSLAB, (Sweden) IBM Research Labs (Haifa, Israel), Brunel University (London, UK), UNINOVA (Lisbon, Portugal) and more.

At the end of the project, the G.I.C. team fulfilled the goals of the project's "Enhancing know how and experience" component, and managed to boost substantially its expertise level on a variety of scientific areas and fields, in which interoperability has a central and essential role. The training activities performed resulted also in the collection of significant

presentation and training material that remains available to the research team for future reference or further use and exploitation within the frame of training activities.

B.1.3.2 Advancing human resources

Objectives and Methodological Approach

The goal of the project's "Advancing human resources" component has been to invigorate the team's human resources capacities by bringing new experienced staff, capable of helping the team to manage its increased research activities and reach out to new districts and scientific fields that could constitute potential application areas for the G.I.C. In particular, the objective of this component has been twofold, targeting:

- The **recruitment of high level experienced staff** to help deal with the increased management demands of the G.I.C. in order to establish its future operation and penetrate new markets in the region.
- The **approach, training and incorporation of young researchers into the team.**

The methodological approach to achieve the above mentioned objectives comprised the following steps:

- Identifying the human resource capacity needs of the G.I.C. with respect to high-level managerial staff, experienced, and young researchers.
- Mobilising the mechanism for the recruitment of high level managers to support and lead the business strategy development and implementation of the Centre.
- Recruiting high level managers.
- Establishing a solid environment in the National Technical University of Athens for promoting and providing training courses on interoperability topics especially at a post graduate level of studies, in order to attract young researchers equipped with basic and core knowledge on the subjects of interoperability.
- Selecting young researchers and introducing them into the activities of the G.I.C., so as to develop a research team to constitute the core of the centre's operation.
- Conducting the preparatory activities for and organizing research secondments.

Recruiting high-level managers

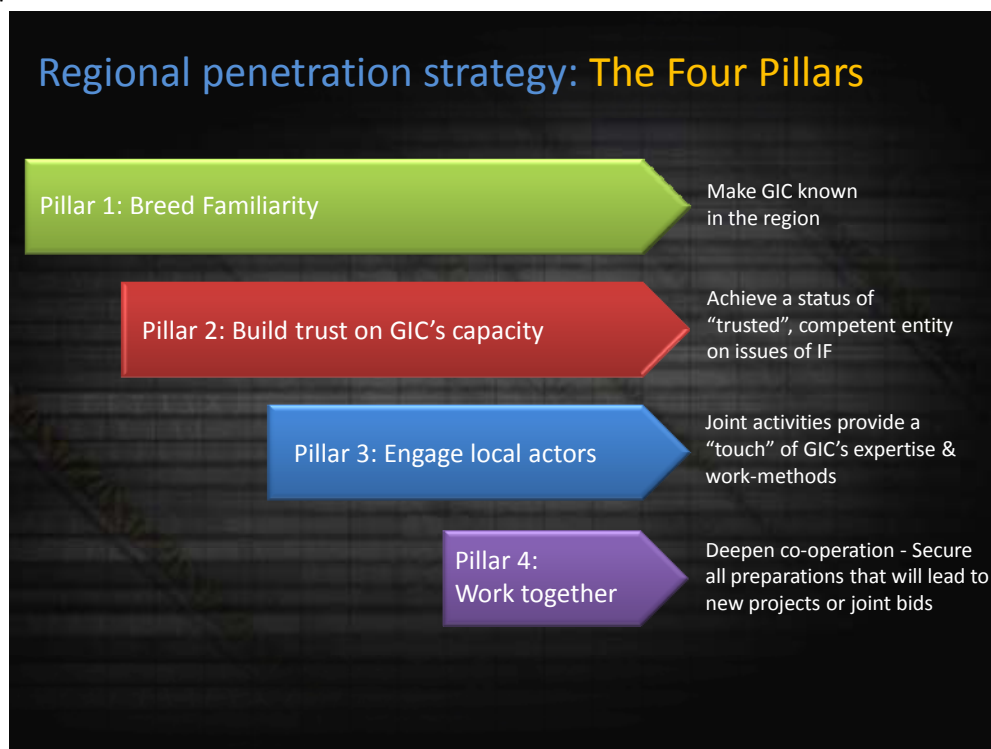
The purpose of this component has been to determine G.I.C.'s present and potential future needs and conduct a "market search" in order to identify high-level personnel capable of helping G.I.C. to manage its research activities, establish its operation in Greece and expand to new geographic regions (Balkans, Eastern Europe, South Mediterranean) and scientific fields (e-Health, e-Learning, Network of the Future), and thereby of contributing in the development of deliverables and outcomes of strategic importance, namely the Greek Interoperability Centre's *Regional Penetration Strategy, Technology Evaluation and Selection Scenario and Business Plan*.

Once the core management team of G.I.C. was established and mobilized, requirements for the recruitment of experienced management experts to support the running and the strategic development of the centre were analysed, and high-level ICT managers and strategists were approached. As a result, a team of senior experts, complementing each other in terms of advanced ICT skills, research capacity, strategic management and business planning competencies, project management skills etc. was formed and gradually

familiarized with the centre's mission and objectives through a series of management meeting/roundtables on the preparatory activities for developing a sound and sustainable business plan of the centre.

During the third year of the project, the G.I.C. management experts started elaborating and developing the key strategic documents to guide the centre's operation throughout the forthcoming 3-years period. More specifically, the project team have developed the **G.I.C. Regional Penetration Strategy**, a report identifying the needs for the G.I.C. services in the nearby geographic regions (Balkans, Eastern Europe, South Mediterranean) and planning a strategy for entering these potential markets. This strategy has provided concrete directions, towards:

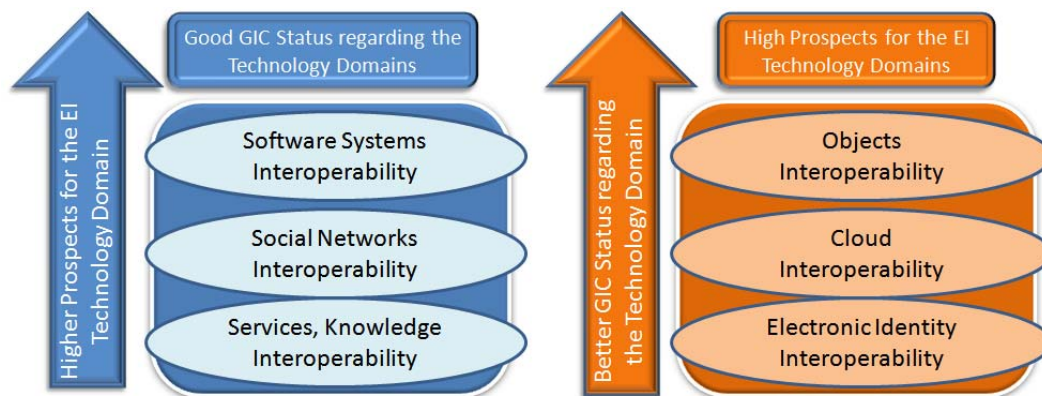
- clearly setting the G.I.C. R&D offering for the target region, consisting of IT and Management related services, training and certification services, and leading edge research and know-how dissemination related to interoperability fields;
- identifying the target group of potential beneficiaries and collaborators for its services in the region, comprising central and regional governments, intra-government institutions, enterprises and ICT companies, as well as private sector associations;
- setting the strategic framework for the centre's positioning with regard to identifying and meeting the specific interoperability needs of the regional actors, lying in breeding familiarity, building trust on G.I.C.'s capacity, engaging local actors, and promoting collaboration;
- defining the marketing toolset to be utilized in implementing the regional penetration strategy, and
- determining the main strategic directions and operational pillars for the regional action plan.



The four pillars of the G.I.C. Marketing Strategy

Along with the Regional Penetration Strategy, the project team developed the **G.I.C. Technology Evaluation and Selection Scenario**, a report assessing the status of the centre in relation to the technology domains, as identified and defined in the emerging structure of

the Enterprise Interoperability Science Base, developed by the FP7 Coordination and Support Action "ENSEMBLE", an initiative coordinated by NTUA-G.I.C., with the purpose to select those domains, in which G.I.C. should focus in terms of further developing its capabilities, expanding its range of services, and pursuing R&D opportunities to ensure its sustainability. The analysis performed showed that G.I.C. should focus on the domains of software systems, social networks, services and knowledge interoperability for providing services, while developing its capacities and ameliorating its status in the areas of objects, cloud and electronic identity interoperability.



G.I.C. Technology Domains of Focus

The **Regional Penetration Strategy** and the **Technology Evaluation and Selection Scenario** provided thence input for the elaboration of the **G.I.C. Business Plan**, i.e. the strategy for establishing and operating G.I.C. as a premium research centre after the end of the project, setting also the details of specific activities and the relevant time-schedule to be followed within the next 2-3 years.

Recruiting and enabling young researchers and offering two way secondments

Addressing the need to increase the centre's human resources in number and quality of researchers, in order to meet its advanced research activities, the G.I.C. team has proceeded throughout the project duration in the recruitment of a number of **qualified researchers (senior, medium and junior)** that have been thoroughly selected to support the establishment and the operation of the centre. These researchers have been involved in the development of the interoperability applications and demonstrations, in the research proposals within FP7, ICT and national initiatives, in regional and national studies carried out to measure, benchmark and support the role of interoperability at an ICT policy level, in managing the technical infrastructure of the centre, in supporting international and regional cooperation research initiatives at a national, regional and international level etc., assuming thus key role in the project activities.

The researchers' recruitment, engagement and training has in fact been supported through the development of dedicated courses on interoperability and interoperability related fields, the organization of student contests, and the organization of secondments with international research centres and companies with which NTUA is cooperating in the scope of international projects and initiatives.

To this direction, GIC during the project duration has done considerable work. Three courses on Interoperability have more specifically been developed by G.I.C. and are included in the academic undergraduate and postgraduate curricula of national universities, as follows: During 2008, a series of lectures, entitled "**Electronic Transactions**" have been created and is delivered since by key experts of the centre as an elective course in the framework of the NTUA postgraduate program "Techno economic Systems" (MBA). During 2010, a second

course on **“Information Systems Interoperability”**, focusing on the presentation and analysis of international standards, ICT tools, business models and general actions that are necessary in order to achieve interoperability in modern business and public administrations, was also developed with the support of GIC and is currently being taught in the University of the Aegean, at the Department of Information & Communication Systems Engineering. It is envisaged that after the end of the project, G.I.C. will continue to contribute in enhancing the interoperability focus in the academic curricula of Greek ICT and engineering academic institutions, by further enriching the postgraduate/master programmes of the NTUA, the University of the Aegean and other universities, where the G.I.C. members participate as trainers/professors with lectures and case studies on interoperability-related issues.

The third course on **“Interoperability: The Great Enabler – Why Interoperability Matters”** has been developed during summer 2011 and includes updated and additional relevant training material on Interoperability from the policy, research and technology perspective. The purpose of this course is to enrich current courses delivered in Universities in Greece or other countries. The course includes up-to-date information about recent developments concerning Interoperability EU Policy and Standardization, whereas it also focuses on Enterprise and eGovernment Interoperability. It makes a presentation of the Future Internet Enterprise Systems and the Enterprise Interoperability Science Base, a state-of-the-art field and challenge which aims to transform the Enterprise Interoperability research area into a vibrant scientific domain, by applying the necessary methods and tools. Finally, the course devotes a section on eGovernment Interoperability. It highlights and references the recent ISA (Interoperability Solutions for European public Administrations) Work Programme actions, which aims to help administrations exchange information more easily and deliver better services to citizens and businesses, as well as makes a presentation on eGovernment Interoperability Frameworks (eGIFs), their principles and the expected benefits from their application, presenting accordingly, the realization of such a framework in Greece.

Additionally, with the objective of attracting students of high calibre, with innovative ideas and creative spirit in the field of e-Government, e-business and interoperability, the centre has established and successfully co-organized for two successive years the **“WeGov Awards”**

competition, a Panhellenic Student Contest for Innovation in Electronic Governance, addressed to students of Greek Universities and Technical Education Institutions, and targeting to encourage and promote young innovation in the specific area. The 1st Panhellenic Student Competition for Innovation in Electronic Governance (WeGov Awards 2010) was launched in April 2010 and attracted the interest of more than 50 students representing more than 20 higher education institutions. The 2nd Panhellenic Student Innovation Contest in Electronic Government (WeGov Awards 2011) was announced on 30th March, 2011 and was met with equal acceptance.

To further enhance the capabilities of its already existing human resources the project team organised moreover a series of **research secondments**, targeting the exchange of researchers for a limited period of time (indicatively 2 to 3 months) among G.I.G. and international centres/companies active in the interoperability, eGovernment and eBusiness domain, with the objective to enable know-how transfer and sharing of research experiences under an on-the-job training scheme. Academic and research centres that collaborated with GIC under the secondments programme included:

WeGov 2011

2^{ος} Πανελλήνιος Φοιτητικός Διαγωνισμός
Καινοτομίας στην Ηλεκτρονική Διακυβέρνηση

WeGov 2010

1^{ος} Πανελλήνιος Φοιτητικός Διαγωνισμός
Καινοτομίας στην Ηλεκτρονική Διακυβέρνηση

- the Semantic Technologies and Applications Research Laboratory (StarLab) of the Vrije University of Brussels (VUB)
- Brunel University, London
- the Group for Research on Interoperability of Systems (GRIS) of the UNINOVA Institute for the Development of New Technologies, Lisbon, Portugal
- Glasgow Caledonian University, Scotland, UK
- Manipal Institute of Technology, Karnataka, India

All the secondments carried out resulted in fruitful cooperation and mutual benefits, yielding in most of the cases high quality research outcomes and material, and putting the foundations for the further collaboration in the future.

B.1.3.3 Creating the G.I.C. technology lab

Objectives and Methodological Approach

Beside enhancing knowhow and experience and advancing human resources, G.I.C. has targeted as well the creation of the necessary technological capacities with the objective to establish a fully equipped technological laboratory, capable of creating scenarios, running interoperability tests and simulations, providing training, and promoting in general research in the field of interoperability. This component has focused therefore on establishing the G.I.C. technology environment, and hence on procuring and setting up the required infrastructures, a process which has been carried out in two phases and following a scalable approach, so as to allow for a balanced development of the centre and gradual installation of the necessary equipment according to the arising requirements during the project course.

Setting up the G.I.C. technology environment

Already from the early stages of the project implementation, the G.I.C. team has been mobilized so as to define the centre's needs in technological infrastructures and to contact suppliers and industrial vendors of the targeted hardware and software components for investigating opportunities of achieving favorable pricing policies. The project team has in fact developed the **G.I.C. lab technical specifications and infrastructures procurement plan**, specifying the necessary technological infrastructures for supporting the G.I.C. functions and provided services. This plan has more specifically presented and analyzed

- the G.I.C. objectives and how these shape the potential operation and service provision of the centre;
- the type of technological infrastructure that needs to be procured to support the G.I.C. operation in terms of functional and non functional requirements that the infrastructure has to fulfill;
- the technical specification for this infrastructure in terms of processor speed, physical memory, storage capacity, concurrent users, etc.;
- the G.I.C. Infrastructure Procurement Plan and its implementation perspective according to the institution's (National Technical University of Athens) internal procurements procedures.

The procurement and installation of the relevant equipment have been carried out, as already stated above, in two phases. The first phase was completed by month 20 of the project and has focused on the following items:

- the technical works for the proper configuration and development of the centre's physical facilities;
- the set-up of the main GIC site;
- the procurement and installation of basic office equipment/furniture for the main G.I.C. site;
- the procurement and installation of technical equipment regarding presentation and meeting facilities (projectors, projection screens and appropriate audiovisual equipment);
- the procurement and installation of the main server facilities (hardware and software) to serve the demonstration and research networking functions of the centre.

By the end of the 1st procurement phase (M20), an operational modern technological environment was set up, capable of serving in an efficient manner the multi-faceted functions of the centre during its initial operation, and thereby functioning as a research collaboration area, a meeting/demonstration room, as well as a working space for G.I.C. researchers. The DSS Lab as the hosting environment for G.I.C. operations, contributed also own server and networking resources to support G.I.C. infrastructure smooth running and incorporation in the laboratory technological environment.

Following this phase (2nd procurement phase starting in M21), the project team carried on identifying additional and changing requirements for the operation of the centre and monitoring state-of-the-art technological developments, so as to define and meet the infrastructural needs of the centre at a more mature point of its development, and consequently to incorporate and take into account relevant findings and considerations from the work implemented within the context of the development of two key documents, namely the G.I.C. Technology Evaluation and Selection Scenario and the G.I.C. Business Plan. Eventually, at the end of the second phase of the infrastructure procurement, the G.I.C. team managed to ensure sustainability of the centre in terms of

- providing state of the art hardware to support its technological operations at the necessary capacity levels for a period of 4 years
- offering the required infrastructure for hosting the training events/meetings of the centre.

Today, the G.I.C. physical infrastructure includes the demonstration area, a server room, a meeting room to serve the needs of the centre for internal meetings as well as for meetings with various G.I.C. stakeholders and finally, additional working space for G.I.C. researchers, G.I.C. visitors and students. Furthermore, it is equipped with state of the art hardware and software infrastructures, allowing for the hosting and demonstration of commercial components and research prototypes, the creation of real-life scenarios, the conduction of interoperability tests, the launch of web applications and the provision of on-line training.

B.1.3.4 Enabling research

Objectives and Methodological Approach

Within the frame of this component on enabling research, the project team has pursued to ensure the participation and contribution of the G.I.C. in a number of research projects and cooperation initiatives in the domain of interoperability, as well as in the work and activities of international research groups. Therefore, it has focused on identifying the centre's research priorities with respect to the objectives of relevant EC research work programmes, and on developing strong links to research poles – i.e. international research clusters and centres, European technology platforms, standardisation bodies – in order to foster potential synergies and co-operations in FP7 and other EC research and standardization initiatives, by inviting them to participate in proposals or by participating as a partner in their project schemas, as well as by actively contributing in their research work and activities.

The relevant work has been in fact organised under the following two interdependent axes:

- **Research activities and international co-operations, and**
- **Contributing to the work of international poles of research**

Research activities and international co-operations

Already from the early stages of the project, the G.I.C. team has been closely following the work programmes of the CIP, eParticipation and FP7 calls as well as the national ICT and e-government programmes, putting significant effort into analyzing the research opportunities arising, fostering ideas, and pursuing research co-operations with partner research centres, targeted to the conceptualization and implementation of interesting interoperability-related projects.

Throughout the project duration the G.I.C. research and development team placed its focus on several calls, being able to demonstrate at the end of month 48 considerable activity, enumerating more than 10 proposals having been submitted by G.I.C.-NTUA as co-ordinator and more than 20 proposals, in which G.I.C.-NTUA has contributed and participated as partner. G.I.C. has contributed in all these proposals, aiming at ensuring that the interoperability research perspective is stressed either as a distinct research work component or highlighted as a “quality” feature that guarantees the efficiency and sustainability of the results attained.

Accordingly, participation of the G.I.C. team in national initiatives has also been strong, with more than 10 proposals having been submitted throughout the project course for projects, relating to interoperability topics.

The centre's strategic objectives and operational targets with respect to the above mentioned research work programmes have been consolidated throughout the project duration in the **G.I.C. strategic plan for FP7**, a key evolving document, comprising research priorities and expertise according to the specific calls, identifying international centres and key people for potential co-operations, planning the preparation of proposals according to the scheduling of FP7 calls, while also reporting and evaluating the progress of the relevant activities.

Efforts under the “research activities and international co-operations” axis have also been placed on ensuring co-operation and synergies among running research projects, implemented under the co-ordination of or with the participation of NTUA, in order to transfer knowhow on the interoperability aspects of the research carried out, to strengthen the interoperability considerations in the project design and implementation, as well as on

establishing research co-operations with qualified research centres, and making research contributions to interoperability standardization bodies and policy actors. The research work that G.I.C. has been implementing in the framework of these projects and research collaborations has been in turn documented in the **G.I.C. research reports**, a series of annual reports, outlining the centre's research activities, i.e. presenting the projects' and initiatives' objectives, main findings and results, partnerships with international centres, next steps etc. As a result, the G.I.C. - DSS laboratory of NTUA is currently following and participating in more than 10 projects on interoperability related topics, or on fields where interoperability plays a major role directly or indirectly, indicatively including the following:

- the EC FP7, ICT **"ENSEMBLE"** project on "Envisioning, Supporting and Promoting Future Internet Enterprise Systems Research through Scientific Collaboration";
- the EC FP7 ICT **"WEBINOS"** project for developing a "Secure Web Operating System Application Delivery Environment";
- the EC FP7 -ICT **"COCKPIT"** project on "Citizens Collaboration and Co-Creation in Public Service Delivery"
- the EC FP7 FoF **"IMAGINE"** (IP) project on "Innovative End-to-end Management of Dynamic Manufacturing Networks" (FP7 Objective 7.3: Factory of the Future);
- the EC FP7 **"ENGAGE"** project on "Innovative Data e-Infrastructures enabling access and utilization of open government data" (FP7-INFRASTRUCTURES-2011-2 Call);
- the EC Directorate General Justice, Freedom and Security **"ECRIS"** project on the "Interconnection of EU Criminal Record Systems
- National Research project **"PLUG-IN"** on the "Development and Provision of Interoperable Electronic Services to SMEs", and
- National Research project **"CAP"** on the development of a "Common AirPort Environment",

Contributing to the work of international poles of research

Following up on the work performed under the "research activities and international co-operations" axis, towards the direction of approaching international poles of research, the G.I.C. team has established co-operation with international research clusters and centres, European technology platforms, standardisation bodies and national policy actors, in order to contribute to policy making and assert the necessary influence – in the form of research consultation – for ensuring that interoperability will maintain a high scope and remain a strategic priority at EU as well as at national and regional level.

Throughout the project duration, G.I.C. has more specifically followed and has contributed through its members in the works of international research poles and initiatives, indicatively the following:

- **EC EI** (Enterprise Interoperability) and **FinES** (Future Internet Enterprise Systems) **Cluster**
- **EISB** (Enterprise Interoperability Science Base) Task Force
- **Interop V-Lab**, the International Virtual Laboratory for Enterprise Interoperability
- **SEMIC.eu**, the Semantic Interoperability Centre Europe
- **IFIP WG 8.5** on Public Administration Systems
- **NESSI**, the Networked European Software and Services Initiative
- **CEN/ISSS** Standardisation Committee's eGovernment Workshop (eGOV-Share)
- **CEN/GITB** (Global Interoperability Test Bed project)

- **ETSI B2B Interoperability Plugtests** initiative
- **IECC, the Interoperability Executive Customer Council**

The outcomes of these collaborations, e.g. G.I.C. research role, contribution and cooperation scheme in each case have been consolidated as well in the **G.I.C. research reports**. The G.I.C. team continues after the end of the project to follow closely and to contribute to efforts and initiatives with regard to policy making and standardization. Through its liaisons to these initiatives it envisions a future interoperability agenda and promotes interoperability implications in future internet systems.

B.1.3.5 Steering national research

Objectives and Methodological Approach

The goal of the “Steering national research” component has been to narrow the gap in interoperability research between Greece and Europe and to align the national research priorities with the European ones. To this end, efforts throughout the four years of the project implementation have been oriented towards two directions, namely:

- **Associating national research centres**, with the objective to create a national and regional research pole, and thereby to foster research collaboration on interoperability related issues. This objective has been fulfilled by identifying and approaching key national and regional research actors both through mobilising the strong networking and contacts of the G.I.C. members, and promoting and disseminating the offering and the potential benefits to be drawn by potential associated partners in supporting the role of G.I.C. as a research pole in the region, as well as by developing and strengthening the centre’s regional scope through promoting strategic cooperation and networking with actors and institutions active in the regional ICT scene.
- **Aligning national research priorities to international guidelines**, a direction that has been addressed by establishing, updating and maintaining a mechanism for monitoring and benchmarking interoperability in the national and regional digital strategies, as compared to the relevant European digital policies.

Associating national research centres

During this task, the project team has associated a number of actors and research centres in the interoperability domain and relevant scientific fields from different geographic regions of Greece as well as the Balkans and Eastern Europe, in order to create a research pole, and provide thereby the grounds for exchanging know how and experience, fostering collaborations in national, regional and international projects, and exerting influence as a collective body towards the state regarding the policy and funding of interoperability research in Greece.

To this end, G.I.C. has addressed research centres, ICT policy actors, central, regional and local administrations, industry actors, software houses, ICT consultants, universities etc. and involved them in a networking scheme with mutual benefits. Beside the cooperation in national and international research projects and initiatives, such benefits have included special reference in the G.I.C. website relevant section, access to the centre’s interoperability barometer and interoperability knowledge base, comprising the centre’s publications and training material, policy documents and project deliverables, as well as

preview of the demonstrators, scenarios and interoperability evaluation studies, developed by the researchers of the centre.

Specific efforts and activities to strengthen the centre's national visibility among the academia, policy and research actors, as well as to address the regional aspect of the project scope have further indicatively included the following events and collaborations:

- The organisation in cooperation with the National Technical University of Athens, the University of the Aegean and the University of Piraeus, and under the auspices of the Greek Ministry of Interior, Decentralisation and eGovernment and the support of the Federation of Hellenic ICT Enterprises, the Microsoft Innovation Centre, Oracle Hellas and other scientific and professional bodies, of the 1st and 2nd Panhellenic Student Competition for Innovation in Electronic Governance, also known as “**WeGov Awards**”.
- The participation of G.I.C. members **as invited trainers/experts in a series of regional workshops**, organized by INA Academy in collaboration with Hellenic Aid and the Centre for eGovernance and Development (CeGD), in the region of South Eastern Europe (Serbia, Montenegro, Bosnia and Herzegovina, Albania, Former Yugoslav Republic of Macedonia), with the view to boost the research and policy perspective of interoperability in e-government.
- The organization in February 2009 of a meeting at the **National Research Foundation on research collaboration** among national and regional players within FP7 and other programmes, focusing on the topics of interoperability and eGovernment.
- The **continuous collaboration with the Centre for eGovernance Development for South East Europe (CeGD)** in the framework of joint research projects (currently on the PADGETS FP7 project), joint dissemination of best practice cases, scenarios and studies in the SEE region to promote the importance of e-government interoperability, the development of joint proposals within the frame of EC FP7 calls, and other national and regional research and development opportunities, as well as regional events.
- The **establishment and coordination of the Greek Interoperability Council**, an initiative of the G.I.C., launched with the participation of representatives from leading organizations, companies and research institutes active in the fields of eGovernance and eBusiness (University of the Aegean-Information Systems Laboratory, Athens Technology Centre S.A., Greek Geeks S.A., - Hardware and Software Engineering (HSE) Ltd., Microsoft Hellas/Microsoft Innovation Centre, Oracle Hellas, Singular Logic S.A., Bank of Piraeus/Winbank), and devoted to coordinating, promoting and advancing interoperability-related efforts in Greece, in terms of:
 - ***organising promotional and training workshops;***
 - ***collaboratively designing and developing interoperability scenarios;***
 - ***demonstrating prototypes and tools for interoperability;***
 - ***participating in research and academic co-operation initiatives.***

At the end of month 48 of the project, G.I.C. has managed to establish a national research pole comprising more than 10 Greek universities and research centres, the R&D departments of more than 5 ICT industry actors, various national policy actors as well as regional research centres, and carries on fostering co-operation in national and international research projects and initiatives, so as to promote the benefits of interoperability to administrations and enterprises at both national and regional level.

Aligning national research priorities to international guidelines

Following on the work performed towards the creation of a national research pole, G.I.C. has pursued to exert influence at administrative level in order to ensure that interoperability maintains a high scope in the Greek Information Society vision and secure the necessary funding for conducting European level research in Greece.

To this end, the centre has issued along with the contribution of other Greek institutions, the **Comparative analysis of the Greek Digital Strategy 2006-2013** to the Enterprise Interoperability Research Roadmap and the i2010 Strategy Framework, a periodical study, aiming at highlighting the relevance of the Greek ICT policy document in question to the European guidelines and policies, focusing on the interoperability scope. The **first version** of this study has evaluated the current ICT situation in Greece, presented the overall status of these three policy documents, related the distinct directions of each one and pointed out the main gaps among them that should be bridged in order to gain a cohesive strategic plan for interoperable digitalization. It has further provided sectoral analysis of the national ICT policy aspects and challenges under the EU i2010 perspective, focusing on the interoperability related issues that apply in the case of Greece, and concluded on the needed characteristics and extensions of the national digital strategy in order to adopt the interoperability challenges. The **second version** has additionally elaborated on the considerations and reflections that are presented in "Digital Commitment", a preparatory document identifying new ICT policy directions/proposals for the Greek Digital Agenda, as well as on the preliminary guidelines of the post i2010 strategy formulation process. Finally, the **third version** of the comparative analysis presents the latest developments towards the direction of aligning the national policy landscape with the European/international one - currently described through **Europe 2020 Strategy and the Digital Agenda for Europe**, and elaborates therefore on key reflections, expressed within the Digital Greece 2020 Forum, a recent initiative, aiming at formulating policy proposals for the digital strategy of Greece in the next decade in the context of the national economic/fiscal environment, national skills and resources, and of the Digital Agenda for Europe/Europe 2020 Strategy. On the research domain, the comparative analysis has focused on the Enterprise Interoperability Research Roadmap (EIRR) and its continuation, the FInES (Future Internet Enterprise Systems) Research Roadmap.

Additionally, G.I.C. issues the **Interoperability Barometer**, a periodical report of Key Performance Indicators (KPIs) on interoperability-related factors, aiming at providing up-to-date, reliable information with regard to the status of interoperability at local and regional level, i.e. mainly in the countries of South-Eastern Europe and the Balkans, which are found within the range of influence of the G.I.C. Starting with a broader scope in its first version which covered several domains, such as e-government, e-business, e-commerce, internet penetration etc, this periodical report has focused in its second and third version on measures/indicators of purely interoperability nature with the goal to improve the stakeholders' (policy makers, academics, researchers) understanding on interoperability at regional level by capitalizing on important interoperability-related knowledge that touches mainly upon the policy, research and practice domains and is structured in six thematic areas, namely:

- I. Interoperability as a strategic goal
- II. National Interoperability Frameworks
- III. Interoperability Projects and Activities
- IV. National Interoperability Practices
- V. e-Government Interoperability
- VI. e-Business Interoperability

The latest version of the Interoperability Barometer includes the interoperability profiles of 21 countries and is complemented by a web processing and reporting system which supports user-friendly navigation, simple data entry and management through standardized data forms, user management, automatic generation of reports, tables, charts and comparative figures. The system is hosted at the G.I.C. website and may serve as a collaboration platform, allowing multiple authorized users to contribute to the Interoperability Barometer. The Interoperability Barometer is a mechanism that is anticipated to develop and grow further with the collaboration of the centre's partners in the region.

Last but not least, throughout the project duration G.I.C. has been working towards enhancing its contribution to policy making and standardisation in Greece and the neighbouring region, thus assisting the implementation of European Policies and interoperability – related initiatives, such as the e-Government Interoperability Framework (eGIF). Thus, it has established co-operation – within projects as well as under informal consultation schemes and initiatives- with the following ICT policy support bodies in Greece:

- **Digital Greece 2020 Forum**
- **Digital Aid S.A.**
- **eGovernment Forum** (Working Groups on “Economic electronic transactions in e-government” and “Business interoperability”)
- **the Observatory for the Information Society**

Currently, G.I.C. experts and researchers actively participate in the Digital Greece 2020 Forum's deliberations, in the formulation of policy proposals and opinion shaping.

B.1.3.6 Integrating and communicating knowledge

Objectives and Methodological Approach

The goal of this component has been to aggregate and diffuse knowledge and research results in interoperability and relevant scientific fields in national and regional level (Greece, Balkans and Eastern Europe). Work under this component has been structured in two interdependent axes, namely:

- **Integrating knowledge**, and
- **Communicating knowledge**,

while key tasks have included the development of the G.I.C. website from the early stages of the project, the establishment of a mechanism for the collection, elaboration and organisation of its content, so as to operate as an informational portal for the target region, as well as for its regular updating, so as to include project and interoperability news, the issuing and dissemination of the Interoperability Guide series of publications, and the constant enhancement of the website services and functions according to the target user group.

Integrating knowledge

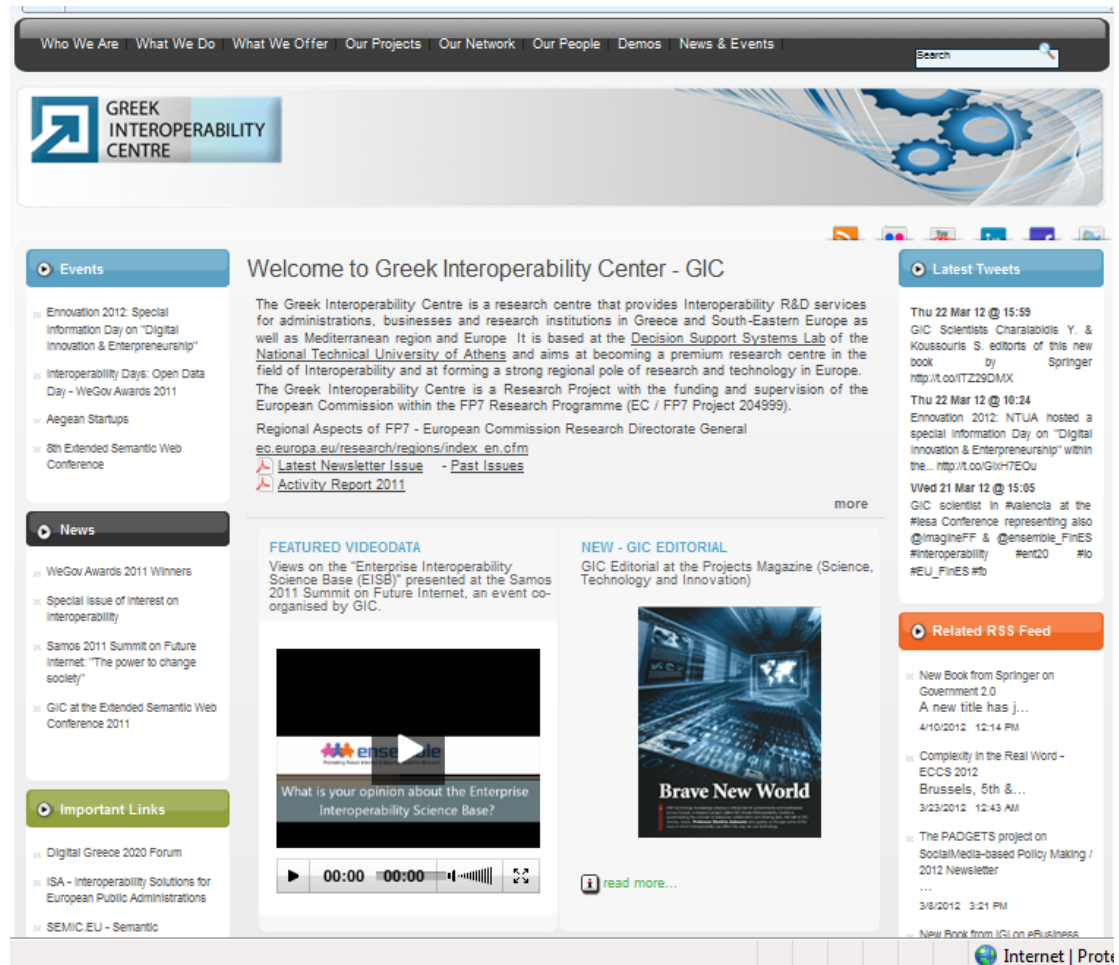
Already, from the early stages of the project, the G.I.C. team established a mechanism for collecting and organising on a regular basis reliable and up-to-date information and material on interoperability, namely research results, scientific papers and publications, public deliverables of projects and initiatives, interoperability research surveys of national, regional, European or worldwide scope, books, commission policy documents, public consultation documents, statistics, best practices and guidelines, standards, whitepapers, interesting links, audio-visual material etc. This material has been organised and made available through the project's **Interoperability Knowledge Base**, created to serve as the central information repository, as well as through a dedicated section on the G.I.C. website, and it has been continuously enriched along the course of the project, comprising currently more than 150 documents and referenced links.

Communicating knowledge

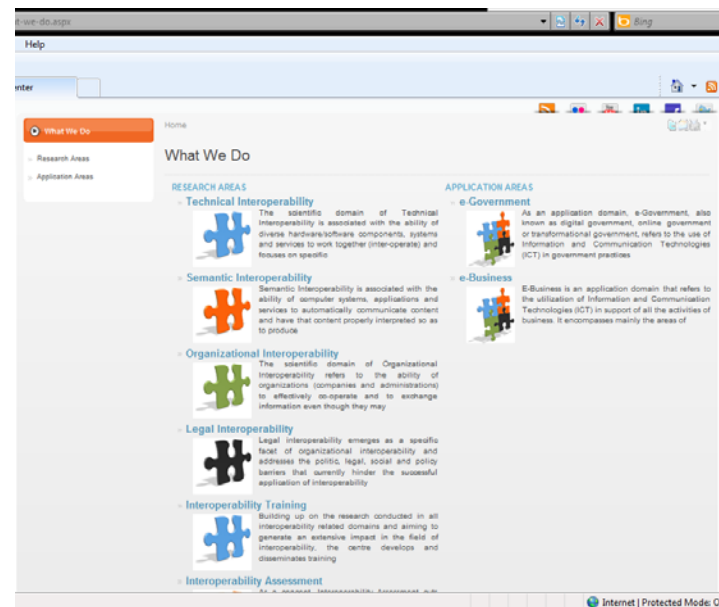
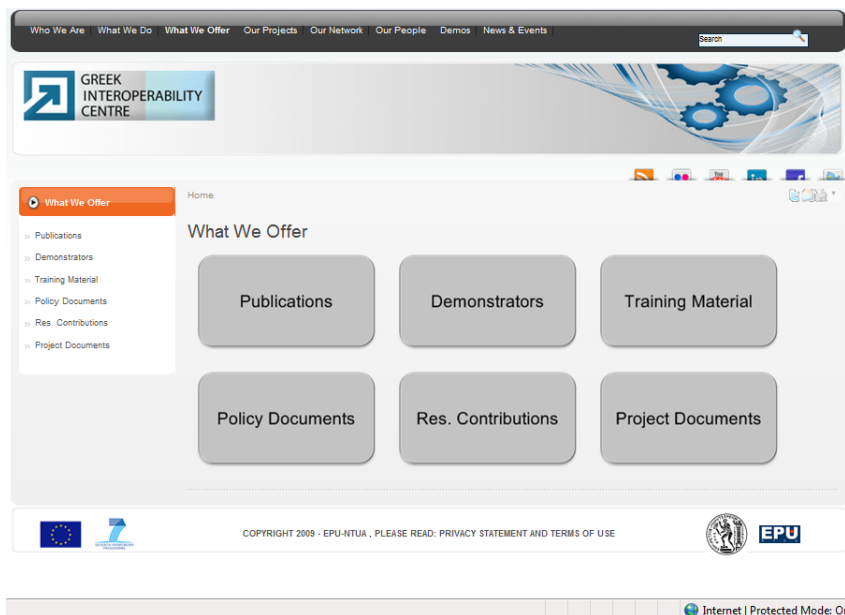
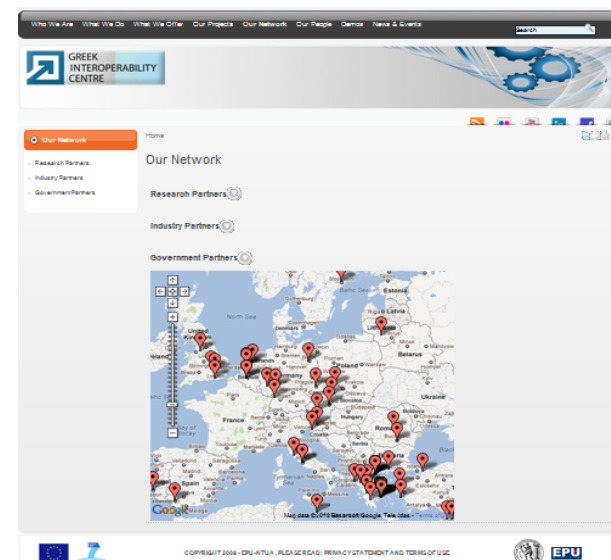
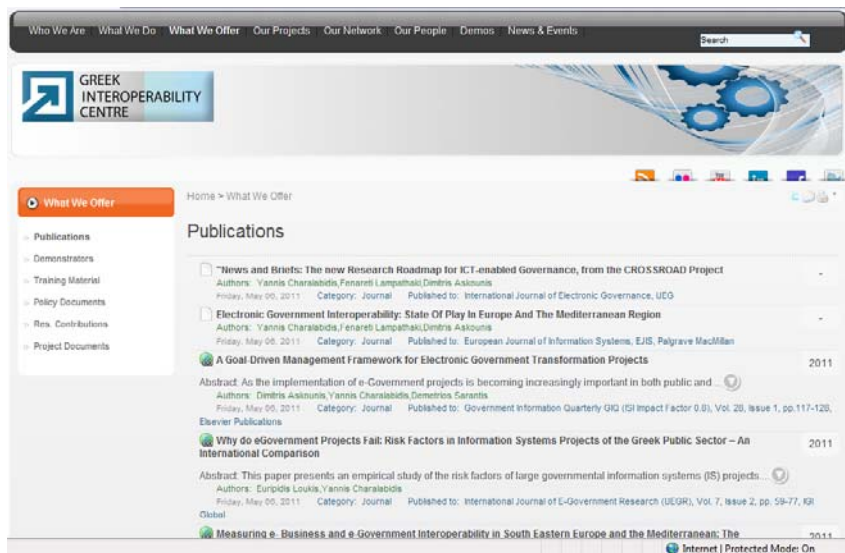
Following on the work performed under the previous task, G.I.C. has pursued to diffuse the material aggregated in order to create awareness around interoperability and its benefits at national and regional level. To this end, the G.I.C. team has primarily put effort into the creation of the **project website**, one of the main tools set from the early stages of the project to support the dissemination of knowledge. The G.I.C. website, hosted on the web server of the Decision Support Systems Laboratory of NTUA, is accessible at www.iocenter.eu and is currently structured in nine main areas, as follows:

- **Home**
- **Who We Are;**
- **What We Do;**
- **What We Offer;**
- **Our Projects;**
- **Our Network;**
- **Demos;**
- **News and Events**

Access rights on the contents of the G.I.C. website include four types of users, namely: Administrator, Content Manager, Registered Users and Users. The website has been changing dynamically along the course of the project and constitutes at the end of month 48 a **web-based collaboration platform** that offers several information and collaboration services, including among others detailed descriptions and demonstrations of tools (platforms, databases, registries, APIs, ontologies etc.) that target to enhance interoperability in the field of e-Governance and e-Business, as well as collaboration facilities to support discussion, know-how transfer, online consultation and collaboration, thematic blogs etc.



G.I.C. Website – screen shots



G.I.C. Website – screen shots

Towards the objective of communicating knowledge, G.I.C. has been contacting moreover interested partners (academic institutions, governmental organizations, industry players), in order to create an extended “stakeholders group” to receive informative material and participate in workshops and networking events. In this respect its target group for online dissemination through the project website has comprised registered users, collaborating organizations/associated members as well as an extended list of more than 150 contacts from the national and international research scene, ICT policy actors, university representatives, ICT companies representatives etc. gathered through G.I.C. project co-operations, networking initiatives and individual experts’ contacts.

Finally, the G.I.C. team has elaborated on the material collected in order to issue the **Interoperability Guides**, a series of publications released on a regular basis with the objective to provide a volume of concise and comprehensive information on interoperability that can help its targeted audience, mainly decision makers of enterprises and policy makers of governments, as well as contributing researchers to design their strategies and find solution tactics on specific interoperability problems. Integrating state of the art material on interoperability from a multitude of sources, e.g. research results, deliverables and reports, national, EU and global best practices and strategies, reports on standards, legal and statutory frameworks and documents, and whitepapers, each one of the six versions of the Interoperability Guide has focused on a specific aspect/dimension of the interoperability field as follows:

- The **1st version of the Interoperability Guide (August 2008)** focused on European Interoperability Frameworks, Enterprise Service Buses (ESBs), Middleware Platforms and Architectures, and Web Service Standards.
- The **2nd version of the Interoperability Guide (February 2009)** provided a glimpse on the EU Research Landscape on Technical and Semantic Interoperability, including a review on EU Legal Framework and Legal Issues.
- The **3rd version of the Interoperability Guide (July 2009)** emphasized on Enterprise Interoperability and especially on Enterprise and Business Process Modelling.
- The **4th version of the Interoperability Guide (February 2010)** offered information and practical guidelines to all stakeholders (Enterprises, Public Sector Bodies and/or Citizens), interested in establishing and using interoperability services in their everyday communications and transactions.
- The **5th version of the Interoperability Guide (February 2011)** provided straightforward recommendations for the design, development and maintenance of e-Government Interoperability Frameworks.
- The **6th and most recent version of the Interoperability Guide (February 2012)** investigated the state of play in the domain of Cloud Interoperability in the light of providing valuable assistance to stakeholders, interested in undertaking cloud computing initiatives.

B.1.3.7 Disseminating and networking

Objectives and Methodological Approach

The G.I.C. team has put throughout the project duration particular emphasis on “Disseminating and networking”, using various forms and mechanisms such as publications, workshops, seminars, information days, conferences and dissemination material, so as to raise awareness about interoperability in national and regional level to all potential interested parties, to cultivate the image of G.I.C. as a premium European research centre in interoperability and to foster potential co-operations. In this context, within the sole task of this component, **planning and conducting dissemination activities**, G.I.C. has worked out on a regular basis a Dissemination Plan, specifying dissemination activities, including:

- The identification of international conferences in the domain of interoperability and relevant scientific fields and the planning of international workshops;
- The organisation of national and regional workshops and information events with the participation of other institutions of the national research pole and interested stakeholders;
- The authoring of academic publications and preparation of presentations in various events (conferences, workshops, information days, etc) in national, regional and international level;
- The production and distribution of marketing material regarding the project's results;
- The collaboration with related projects and working groups from the aspect of information exchange in order to offer harmonized results in related activities and to provide a kind of “Knowledge Map” in related scientific efforts;
- The participation in the Enterprise Interoperability cluster and international research groups supported by the Commission.

Planning and conducting dissemination activities

The **G.I.C. Dissemination Plan**, addressed mainly within the scope of the European Research Area (ERA), has been based on two key elements, namely:

- A flexible, international dissemination and promotion strategy, with the objective to be present everywhere where Interoperability is concerned, particularly within the ERA, and
- Cross-fertilization dissemination and promotion with key interoperability stakeholders at international, EU, national, regional and local levels, in order to enable the establishment of two-way continuous and interactive relationships to provide continuous feedback, essential for the flexible character of the present strategy, with a series of actors, including:
 - Interoperability Experts/Managers
 - International Research Centres/ Academic Institutions and other Research Groups
 - The European Commission, the Presidency of the European Union, the European Parliament and the Committee of Regions of Europe
 - Governments and governmental bodies
 - Enterprises, in particular SMEs and VSEs
 - Standardization Bodies and International Scientific Organizations

- Ongoing research projects and initiatives of FP7 relating to interoperability, such as the projects of the Enterprise Interoperability Cluster, the projects of the Digital Ecosystems clusters and the projects of the eGovernment and eParticipation domains.

The G.I.C. dissemination strategy has focused in particular on the following activities:

- The development of the project Newsletters: Twelve newsletters have been issued during the project lifetime, communicating news on project activities and results, conferences' and events' agenda, interoperability scientific news and projects' developments. The newsletters have been available for downloading at the project website, sent electronically to registered users and the G.I.C. mailing list and disseminated at the various events that have been organized by G.I.C. or in which G.I.C. has participated.



Indicative G.I.C. Newsletters

- The development of the **G.I.C. brochures and promotion material**: G.I.C. has created a project brochure, promoting the centre's mission, offering and expected benefits for targeted stakeholders from cooperating and/or sponsoring its activities, as well as a series of GIC project factsheets for the research projects, being implemented with the coordination or participation of the G.I.C. - NTUA team.



G.I.C. Brochures

- Moreover, G.I.C. develops promotion informative leaflets on each one of the IO demonstrators as well event/activity specific brochures to target the needs of its audience.

Each leaflet provides information on:

- Purpose and scope
- Business Case
- Interoperability Features
- Tools and Technologies deployed
- Acknowledgement



Indic. Demonstrator Brochure

- The participation in conferences and other events: Throughout the project duration, G.I.C. has pursued and ensured participation in more than 60 international and national/regional conferences and events, indicatively including the international scope organizations of the **iESA**, **ISD**, **eGOV**, **eChallenges**, **IADIS-CSIS**, **HICCS**, **AMCIS**, **MCIS**, **KMIS**, **WSKS** etc. conferences, the national/regional **eeeGOV days**, **PCI**, **Bled Forum** etc. series of events, as well as a multitude of EU-level research, networking and standardization events and a series of workshops and information days of national and regional scope.
- The organisation of workshops: During the 48 months of the project implementation, G.I.C. has organised more than 10 international and more than 6 national/regional workshops. The list of the events that have taken place with the co-ordination or co-organisation of G.I.C. encompasses among others:
 1. The “*Interoperability Day on Open Governmental Data*”, in December 2011, Athens.
 2. The “*Cloud Infrastructures and Interoperability in the Public Sector*” Track, within the MCIS 2011 Conference, in September 2010, Tel-Aviv.
 3. The “*Samos 2011 Summit*” in July 2011 on “*Future Internet: The power to change society*”.
 4. The “*Samos 2010 Summit*”, a summit meeting on Electronic Governance and Policy Modelling in July 2010, Samos, and its sequel,
 5. The “*Interoperability Day for the Private and Public Sector*” in June 2009, Athens.
 6. The “*Science Base for Enterprise Interoperability*” Workshop, held in conjunction with the iESA 2010 Conference, in April 2010, Coventry.
 7. The 3rd International Workshop on “*Interoperability Infrastructures and Standards for Administrations and Enterprises*”, held at the eChallenges 2009 Conference, in October 2009, Istanbul.
 8. The “*Interoperability of Public IS Infrastructures*” Track within the MCIS 2009 Conference, in September 2009, Cairo.
 9. The “*Worldwide Advances in eGovernment Interoperability*” Mini-track for two successive years within the frame of the AMCIS 2009 and 2010 Conferences, held in August 2009, San Francisco, California and August 2010, Lima respectively.
 10. The “*eGovernment Infrastructures and Interoperability*” Mini-track in the margin of the HICSS 2010 Conference, in January 2010, Hawaii.
 11. The “*1st Greek Interoperability Days*” workshop in December 2008, Athens

12. The *"e-Government Interoperability Infrastructures"* Workshop, within the eChallenges 2008 Conference, in October 2008, Stockholm.
 13. The *"eParticipation Systems Interoperability"* Workshop, within the eGOV 2008 Conference in September 2008, Torino.
 14. The *"Greek e-Government Interoperability Framework day (eGIF)"* in June 2008, Athens, as well as an eGIF workshop of similar scope in September 2008, Thessaloniki.
 15. The *"GIC Interoperability Day"* in June 2008, Athens.
 16. The *"Demonstrating Research Results on Enterprise Interoperability"* Workshop within the context of the Enterprise Interoperability Cluster of FP7, in March 2008, Berlin.
- The authoring and preparation of academic and research publications: G.I.C. has been extremely active throughout the whole duration of the project, being able to demonstrate at the end of month 48 more than 60 publications on interoperability-related topics in scientific journals, conferences and books.

A more detailed and structured presentation of the G.I.C. Dissemination Activities is provided in the relevant tables of section B2.1 of the final report.

B.1.3.8 Establishing G.I.C. operation

Objectives and Methodological Approach

Building on the activities carried out in the rest of the project's work packages, this component has focused on launching and sustaining the G.I.C. operation according to its objectives, and thereby on creating an added value offering for the target group of the centre and establishing a successful and efficient mechanism for communicating it to the potential beneficiaries. Within the sole task of this component, entitled **running the G.I.C.**, the project team has put effort on the realisation of the core operations of the centre, i.e. the provision of support to the government and the industry, mainly through:

- Issuing guidelines and best practices regarding the implementation of interoperability related IT projects.
- Providing stakeholders with tested technologies and IT solutions.
- Creating and running interoperability scenarios incorporating the particular needs of several stakeholders.
- Conducting interoperability tests on commercial software products and IT solutions.
- Creating demonstrations and presentations based on real life applications.
- Offering guidance and technological expertise in open source technologies and open standards.
- Creating training material and interoperability courses.
- Providing project management and consultancy services in interoperability related IT projects.

Running the G.I.C.

Since the beginning of the centre's operation, G.I.C. researchers have been elaborating and developing demonstration and evaluation scenarios, prototypes and test-beds to serve as a proof of concept of the interoperability dimensions and to highlight technology solutions and research directions in the areas of e-Government, e-Business and e-Participation as well as in other application domains. G.I.C. proof of concept activities, demonstrators and test beds have targeted more specifically to:

- promote and advance interoperability research in the region and in the wider European Research Area.
- facilitate the decision making procedures on behalf of businesses or governmental organizations, whose personnel may not have the necessary know how to evaluate them or is not even aware of such solutions, by clarifying the choices at hand.

G.I.C. has in fact developed either in its own capacity as a research centre or in collaboration with interoperability-related projects novel interoperability methodologies and solutions and is in place to demonstrate currently a rich service offering, which enumerates among others the following prototypes, scenarios and commercial solutions' evaluation studies, made available to the target audience through a dedicated space on the G.I.C. website:

Interoperability Demonstration Centre *demonstrators and show-cases*

eGovernment Service Registry	eGovernment Interoperability Standards and Compliance	B2B Interoperability Readiness Assessment (RIASSESS)	EGovSimulation Engine: Calculating the Gains for Administrations and Citizens of Governmental Services Transformation towards interoperability	eParticipation Systems for Cross-Societal Deliberation on various thematic Issues
Regional Interoperability Barometer <i>SEE</i>	The e-Deposit Slip <i>(scenario)</i>	The EXELIXIS tool: Semantically-enriched Governmental Data Components and XML Schemas Management	e-ID Federation: Security Token Service implementation using Windows Identity Framework	A Social Media collaborative Knowledge Resource Library (wiki)

The G.I.C. Demonstrators

The image displays two screenshots of the G.I.C. Demonstrators website. The left screenshot shows the 'eGOVSIM: Calculating the Gains for Administrations and Citizens of Governmental Services Transformation towards interoperability' page. It features a sidebar with navigation links like 'Service Registry (Greece - English)', 'eParticipation Systems for Cross-Societal Deliberation on various Thematic Issues', 'eGov Standards and Compliance', 'Integration Evaluation (RIASSESS)', 'Interoperability Barometer', 'eGOVSIM: Calculating the Gains of Governmental Services Transformation', 'e-Deposit Slip', 'The EXELIXIS Semantically-enriched Governmental Data Components and XML Schemas Management', 'e-ID Federation: Security Token Service implementation using Windows Identity Framework', and 'Social Media Interoperability the way'. The main content area includes a diagram of the eGOVSIM model and text describing its purpose and benefits. The right screenshot shows the 'The electronic Deposit slip from a Public Revenue Office: How the electronic version of the Deposit slip will transform the delivery of e-Government Services' page. It includes a diagram illustrating the process of issuing and using an e-Deposit slip, involving entities like m-ANOUS, e-LECTRA, and BANKS, and services like CSC and eID.

- the **e-Government Service Registry** Demonstrator;
- the **e-Government Interoperability Standards and Compliance** Demonstrator;
- the **RIASSESS**, a B2B Interoperability Readiness Assessment System;
- The **EXELIXIS**, a prototype on Semantically Enriched Governmental Data Components and Schemas Management;
- The **eGOVSIM**, a simulation engine for Calculating the Gains for Administrations and Citizens of Governmental Services Transformation towards interoperability;

- the **e-ID Federation paradigm**, a Security Token Service implementation using Windows Identity Framework;
- the **Social Media Apps wiki**, a Collaborative Knowledge Resource Library, supporting Social Media Interoperability;
- the **e-Deposit Slip scenario**, a case on how the electronic version of the deposit slip from a Public Revenue Office can transform the delivery of e-Government Services;
- A series of interoperability evaluation studies on the Microsoft Citizen Services Platform, Ascentn Agile Point BPM Platform for .Net, Oracle Solution for Smart Cities, the Windows Azure platform to create cloud applications and services etc.
- the e-Participation Systems for Cross Societal Deliberation Demonstrator based on FEED project results;

Additionally, G.I.C. has made thorough and steady steps towards penetrating the national e-Government “market” by offering scientific services on purely interoperability aspects or on interoperability-related dimensions for ICT e-Government projects and initiatives. Through the NTUA-DSS Laboratory, it has more specifically been involved in a series scientific R&D and consultancy projects offering scientific and technical services to numerous governmental bodies and national administrations, including:

- the Greek Ministry of Interior Affairs;
- the Greek Ministry of Justice;
- the Central Union of Greek Municipalities;
- the Special Secretariat for Digital Planning on the formulation of the digital strategy;
- the Athens International Airport “Eleftherios Venizelos”;
- the General Secretariat for Information and Communication;
- the General Secretariat of New Generation;
- the Ministry of Culture and Touristic Development;
- a number of Greek Municipalities (Nea Ionia, Ano Liossia, Megara and Neo Heraklion) for the development of their municipal electronic service portals.

Last but not least, G.I.C. has established strong relations with major players in the ICT industry, indicatively Microsoft, Oracle, SAP, Google, IBM etc., as well as SMEs active in the development of interoperability solutions and the provision of relevant services. G.I.C. has signed a Memorandum of Understanding (“MoU”) with Microsoft Hellas S.A., setting the framework for a continued and expanded cooperation between the two entities mainly towards the following areas:

- the development of specific interoperability solutions either as interoperability demonstrators or real case studies related to e-Government solutions, both in broader areas such as security and e-identity, business process management or in response to government directives on citizen services solution requirements;
- the co-organisation or co-presence in national and regional interoperability events with the participation of other international vendors, as well as government agencies and private sector companies;
- G.I.C. participation in Microsoft’s Interoperability Executive Customer Council in the US, held twice a year, representing South East Europe region, exchanging feedback with Microsoft Corporation about interoperability issues;
- Collaboration in mutually agreed EU academic or research projects;

The centre's activities and achievements since the beginning of the project have been consolidated in the **G.I.C. Activity Report** (D8.1 - Summary reports of G.I.C. operation), a publication released annually to promote the operation of the centre and to enhance its visibility to the wider public.

At the end of month 48 of the project, G.I.C. constitutes a premium research centre in the field of interoperability across the entire Greek region, capable of conducting innovative EU level research and supporting the government and the industry in achieving the benefits of interoperability. It further serves as a show case laboratory demonstrating the results from research and development projects such as prototype e-Business and e-Government systems, and acts as a consulting organization, offering scientific services to public bodies in need for interoperability solutions, while it has established co-operation with more than 20 private sector enterprises and organisations.

B.1.4 Potential impact (including the socio-economic impact and the wider societal implications of the project so far) and main dissemination activities and exploitation of results

B.1.4.1 G.I.C. Impact

During the 48 months of its implementation, G.I.C. has gained significant momentum and has managed to establish itself as a premium research centre, capable of conducting innovative EU level research, and supporting the Government and the IT Industry in achieving the benefits of interoperability. Additionally it has given visibility and raised awareness about the importance of the interoperability research and application domain through an active contribution and presence in all facets where interoperability is involved. In conformance with its objectives, and thereby in order to stimulate the transfer of knowledge, to contribute to really interoperable one-stop services, and to catalyse business and government innovation, G.I.C. has focused its activities on shaping the interoperability best practices guide, testing and demonstrating interoperable solutions in real life situations, becoming an active member in interoperability standardisation bodies, contributing in interoperability-related research projects and ensuring its research alignment with European directions and policies. In this respect, it has addressed and approached various stakeholders, namely:

- Enterprises, being either large multinational companies or small medium organizations (SMEs) in Greece, that have been informed about the benefits that an interoperable infrastructure can bring to their overall function, as well as the new business opportunities that come along with the cooperation with a research centre as G.I.C.
- Public organizations, i.e. Ministries, Districts, Prefectures, Municipalities and other small medium organizations (SMOs), that have been familiarised about the benefits that interoperability can bring to public administration processes and how it can be achieved.
- Academic institutions and research centres in national and international level, and in particular regional research institutions and universities, so as to diffuse interoperability-related scientific advancements and to engage them in mutual collaboration and exchange of knowledge.
- Standardisation bodies and international scientific organisations, in order to contribute to their work and standardisation efforts.
- Acknowledged experts and managers in the domains of interoperability, e-Business and e-Government.

The impact of the project/centre's activities can be assessed at a strategic level and at an operational level.

- **At the strategic level**, the Centre contributes and will continue more strongly to contribute the interoperability best practices shaping and interoperability standardisation through Industrial Innovation support, a Policy Formation support and preparatory actions for the creation of a national interoperability certification and accreditation Authority.
- **At an operational level**, the enhancement of research capacities and equipment, the networking with enterprises, public sector and research centres and the dissemination of results and publications will make possible the interoperability adoption and the research alignment to EU Guidelines.

The G.I.C. impact with respect to specific efforts and activities undertaken along the course of the project are discussed in the following paragraphs under three perspectives, namely

Scientific and Research Impact, Standardisation and Policy Impact, and Sustainability Building, while a more thorough view of the project's contribution to broader developments in business, economy and society is presented under the G.I.C. socio-economic impact.

Scientific and Research Impact

G.I.C. emphasis has been laid on advancing research in the domain of interoperability and building research capacity, by actually getting involved in relevant projects and initiatives, as well as by fostering knowledge transfer. Positive impacts towards this direction have included the following activities:

- **Targeting and achieving participation in research projects** in relevant interoperability related calls within FP7, CIP, eParticipation and other EU research programmes, as well as in national initiatives and programmes within the Greek Digital Strategy. Key achievements have included contribution and participation in the FP7 projects **ENGAGE, ENSEMBLE, IMAGINE, WEBINOS, CROSSROAD, COCKPIT, PADGETS**, etc. as well as in national research endeavours such as the projects **PLUG-IN, CAP**, etc.
- **Facilitating research synergy** among ongoing projects of the NTUA-G.I.C. team on interoperability issues through **exploitation and further promotion/dissemination** of interoperability related results to the community of interoperability stakeholders in the target region.
- Organising and participating in targeted **interoperability related training** events, seminars, workshops, as well as organising **training visits** to international research centres for G.I.C. members.
- Implementing the **research secondments programme** in co-operation with international research centres/stakeholders.
- Strengthening of **the training curricula in Greek universities**, through the incorporation of dedicated courses on interoperability related topics in the postgraduate and undergraduate programs of the National Technical University of Athens and the University of the Aegean respectively, as well as through further promotion of relevant training initiatives in the graduate and master programmes of other national universities.
- Authoring numerous research and scientific **publications** and delivering presentations in academic, training and networking events.
- Preparing and publishing 6 issues of the **Interoperability Guide**, a publication promoting interoperability best practices and providing key recommendations to targeted stakeholders.

Standardisation and Policy Impact

In the G.I.C. project, contribution to standardisation has been a fundamental part of its mission, since in order for research results to have a meaningful impact on standards; research and standardisation efforts should go hand-in-hand. G.I.C. has additionally contributed in policy making and asserted the necessary influence in order to ensure that interoperability will maintain a high scope in the Greek Information Society vision and will remain a strategic priority at EU level. G.I.C. impacts on standardisation and policy have been made possible through the following activities:

- Contributing in and following the **work of international interoperability networks, standardisation bodies and policy actors**, currently including the **FINES Cluster, Interop**

V-Lab, SEMIC.eu, NESSI, the Interoperability Executive Customer Council, NEX-OF RA, CEN/ISSS Standardisation Committee etc.

- Contributing in and even co-ordinating the **work of national interoperability endeavours and policy actors**, indicatively including currently the **Digital Forum 2020**.
- Establishing and co-ordinating the **Greek Interoperability Council**, an initiative devoted to promoting interoperability benefits to administrations and enterprises in Greece. Founding members comprise G.I.C., Microsoft Hellas, Oracle Hellas, ATC SA, GreekGeeks SA, HSE Ltd, the Athens University of Economics and Business, the University of Aegean, Piraeus Bank and SingularLogic SA etc.
- Monitoring and studying the **EU policy framework** (e.g. Digital Agenda for Europe/Europe 2020 Strategy, i2010 Strategy Framework etc.), as well as the underlying **legal framework with regard to electronic transactions** and issuing comparative studies assess the degree of readiness of the respective policies (currently reflected in the Digital Strategy for Greece) at national level.
- Establishing, maintaining and updating the **Interoperability Barometer**, a mechanism developed to support the monitoring of the interoperability status at a national level, for a number of countries in the target region.

Sustainability Building

During the past 48 months, G.I.C. has created all the necessary capacities in order to conduct innovative research as well as to provide consultation, scientific and technical services to public administrations and enterprises. Within the project, emphasis has been put on both the procurement and installation of the infrastructure and equipment, in terms of hardware (i.e. servers, audiovisual equipment etc.), required to enable the development, testing and demonstration of various solutions and the conduction of training activities, as well as on the advancement of the centre's human resources in terms of the researchers' qualifications and knowledge, spanning a variety of interoperability-related areas, e.g. web technologies, information sciences, management sciences etc. Efforts have also focused on associating relevant research centres at national, regional, European and international, as well as on promoting networking and establishing collaboration with public organisations and enterprises. The project impact towards building and ensuring the centre's sustainability can be more specifically assessed against the following activities and measures:

- Strengthening of the G.I.C. research capacity through the organisation of and participation in targeted **interoperability related training** events, seminars, workshops, as well as through the organization of training visits to international research centres for G.I.C. members.
- Implementation of five **research secondments** in co-operation with international research centres/stakeholders.
- Staffing of the Centre **with high-level managers, experts and researchers** with high academic credentials, who have been engaged in the centre's strategy planning and operations and constitute the **key drivers of its research excellence**.
- Development of the Centre's **Regional Penetration Strategy** and design of its **Strategic Business Plan** with the view to ensure the continuation of its operation after the project completion.
- Establishment and ongoing upgrading of the **G.I.C. technology environment** to support the research operations of the centre and of the affiliated synergy projects of NTUA.

- Development of **interoperability demonstrators, studies and reusable interoperability scenarios** in eGovernment and eBusiness. More than 8 demonstrators have already been developed, aiming at demonstrating the benefits of interoperability on various dimensions.
- Organisation of and participation in **national, regional and international workshops/conferences** presenting the research work of the G.I.C. team, as well as publication of papers in established journals, conference proceedings.
- Establishment of a **dissemination mechanism targeting a large extended informal network** of collaborating research centres, universities, ICT industry and public administration actors, extending over Greece, the region of South Eastern Europe, the EU and the Mediterranean. The Centre's Network is a **strong dissemination tool** in the service of interoperability research projects or policy endeavours at a European, regional and national level to promote their results or proofs of concept.
- **Provision of support** to governmental organisations and public authorities – **interoperability best practises, technologies and solutions** that have been tested, demonstrations, project management and training.

G.I.C. Socio-economic Impact

The potential **medium to long term impact of the Interoperability Centre** in the region of South Eastern Europe goes beyond the above presented implications to much broader developments in business, economy and society, and is in fact of particular importance especially nowadays that Enterprises and Governmental Organizations seem to be, more than ever, challenged by the financial crisis and globalization that put increasing pressure on their operational efficiency and demand decrease in their integration costs, bringing in the limelight the multi-disciplinary issue of interoperability. The G.I.C. effect at the wider scale of economy and society is found in the following directions:

- **Strengthened competitiveness of enterprises** in Greece, in South Eastern Europe and the EU in all sectors of the economy: G.I.C. has been stimulating and supporting breakthrough research for catalysing business innovation and cultivating the attitude that the only comparative advantage enterprises will enjoy will be their ability to collaborate, their ability to adapt and their ability to interoperate. Thus, the research work supported within G.I.C. operations is anticipated to lead to results that add value to enterprises and to help enable open, competitive markets in both supply and demand of solutions.
- **Improved, efficient and cost-effective interoperable public sector services:** In the public sector, the creation of a regional interoperability competence node is envisaged to contribute in shaping the state-of-the art technologies and standards that promote interoperability at organizational, semantic and technical level and in proposing interoperable solutions to Public Sector Organizations. Interoperability proof-of-concept activities and demos can facilitate and therefore improve the decision making process of the governmental organizations, whose staff may not have the necessary know how to evaluate them or may not even be aware of such solutions. Interoperability initiatives can ensure substantial savings on public sector spending, returning benefits to citizens, to the government, to enterprises and to society at large. E-government can leverage the benefits of interoperability with a direct, positive impact on the GDP.
- **Interoperability research alignment with relevant European directions and policies:** G.I.C. is an active member in national, regional and EU interoperability standardization

bodies, stimulating the transfer of knowledge and contributing in deploying really interoperable solutions and services, in accordance with EU directions and policies.

- **Enhanced regional interoperability research capacity:** G.I.C. has invigorated and is meant to further empower the national, the South-Eastern European and the EU research community in the interoperability related domains by establishing strong and long lasting collaboration liaisons, acting also as a networking node among interoperability laboratories within the Greece, in South Eastern Europe, across Europe and overseas, with enterprises and public organizations. In the course of time, the G.I.C. - through its collaboration with academic and research institutes in the target region - will further improve the ability of researchers and students to carry out high level interoperability research, leveraging knowledge from different organizations and cultures.
- **Enhanced visibility and awareness of the interoperability importance.** G.I.C. efforts towards highlighting the importance of the interoperability research and application domain are expected to have contributed in attracting a critical mass of research institutions, public bodies and enterprises needed to deliver results and a long-lasting impact in the domain.

B.1.4.2 G.I.C. Main Dissemination Activities

Networking and collaboration, awareness raising about interoperability, dialogue among stakeholders, impacting policies and strategies and community building were identified already from the beginning of the project as key priorities of the Greek Interoperability Centre. Dissemination in G.I.C. was therefore attributed great significance in order to enhance the visibility of the interoperability domain as well as to cultivate the image of G.I.C. as a premium European research centre, promote networking activities and foster potential co-operations. In brief, dissemination policies and activities for spreading awareness on the Greek Interoperability Centre and its outcomes across target groups along the course of the project have included:

- The creation of the **G.I.C. website**, predestined not only to present the project's vision, objectives and outcomes, but also to be a referenced site containing demonstrations of interoperability solutions and tools, as well as interoperability-related scientific/research and policy material and links, and to be regularly updated.
- The design and production of attractive - printed and electronic – **dissemination material** on the project's results, progress and anticipated benefits, tailored to the objectives of the project itself and to the goals and outcomes of affiliated projects, as well as of **marketing material**, and the distribution of the former to a wide range of target audiences and channels.
- The G.I.C. dissemination and marketing material includes: **GIC information folder; GIC brochure; posters and roll-up stands** used in events; **project research brochures** that create awareness on the research activities of the centre within the projects that it is involved in; **GIC demonstrators' brochures** that describe the business case and the benefits of applying interoperability solutions, as highlighted by each demonstrator developed; etc
- The issuing and distribution of the **project newsletter** on a quarterly basis (12 newsletters have been created and issued during the project lifetime), containing news on the project's activities and results, events' agenda, interoperability scientific news and projects developments etc.

- The issuing on a regular basis of the **Interoperability Guide** (enumerating at the end of month 48 of the project 6 issues), a best practices guide, consolidating in-depth and useful information and recommendations on various interoperability-related problems or dimensions and providing thus a reference point for the know-how and experience acquired during the project.
- The issuing and distribution of the **G.I.C. Activity Report**, an annual publication, summarising the centre's activities and achievements since the beginning of the project and promoting its visibility towards the wider public.
- **Academic/scientific publications** (more than 50 publications until the end of the project), in targeted distinguished scientific journals as well as in national and international conferences, diffusing the research and scientific work of the G.I.C. team towards the academic community.
- **Participation in various events** (counting more than 40 events until month 48 of the project), e.g. forums, conferences, workshops, information days, training seminars etc. with presentations on the project's objectives, activities and results, creating awareness among enterprises, governmental and intermediaries' bodies, policy makers and the IT industry about the potential impact of the G.I.C.
- **Organisation of workshops/events** within the context of conferences or other occasions of either international or national/regional scope (12 international workshops and 7 national/regional events), attracting respectively worldwide attention and research interest in Greece, as well as communicating knowledge and experience in the interoperability domain across the entire Greek region and the Eastern European vicinity. Among the numerous workshops organized by GIC we refer indicatively to the following regular event activities:
 - Organisation of annual "GIC Interoperability Days": Regional workshops intended to elaborate on a specific interoperability domain (open data, enterprise interoperability, egovernment interoperability etc) with relevant stakeholders from policy, research and industry field. The 'GIC Interoperability Days' have been implemented with great success the past 4 years so GIC intends to exploit the recognition built, in order to support continuing implementation of such events.
 - Co-Organisation of the Samos Summit, which has been established during the past three years as a series of annual conferences hosting experts consultation sessions and workshops on selected future ICT technologies and research topics. It has built recognition as an event that facilitates fruitful research discussions and networking in the context of presenting highlighted projects' results and engaging a wide audience in relevant discussions.
 - Co-Organisation of WeGOV awards, an established annual contest addressed to students and young researchers aiming to promote innovation and support novel business approaches through interoperability solutions.
- **Networking** with experts and scientists, research centres, governmental organizations and the industry, stimulating their involvement and engagement in the rest of the project's activities, and **collaboration with related projects**, encouraging information exchange.

In summary, the outcomes of the G.I.C. dissemination activities were effective enough to bring about impact in the domain of interoperability as well as to ensure the sustainability of the centre.

B.1.4.3 G.I.C. Exploitation of Results

Since G.I.C. has been a Support Action, there are no patents, trademarks, registered designs or any traditional exploitation plans.

Nevertheless, there is rich and remarkable research, training and networking activity, which is to be sustained after the end of the project.

In order to ensure that G.I.C. efforts and outcomes will be properly reused and exploited beyond the completion of the project, and thereby that the Greek Interoperability Centre will sustain its operation as a premium European research centre, capable of conducting high level research on interoperability, and supporting the government and the industry in achieving the benefits of interoperability, the G.I.C. team has developed the G.I.C. Business Plan. The Business Plan drafted within workpackage 2 (D.2-4 – Business Plan of CO nature), provides the main directions for exploiting and building up on the project's results in order to ensure the sustainability and viability of the research centre, as has been the main objective of this Action.

Besides being a mere deliverable, falling within the “advancing human resources” component of the project work plan, it outlines the strategy for establishing and operating G.I.C. as a premium research centre after the end of the project. Such a strategy builds on the project's preparatory activities with regard to enhancing know how and experience, advancing human resources, creating the G.I.C. technology lab, enabling research and steering national research, integrating and communicating knowledge, disseminating and networking etc. to ensure through the proper design and planning, which includes definition of the G.I.C. service offering, target group of potential beneficiaries, marketing approach and toolset, as well as operational pillars, the operation and sustainability of the G.I.C. as described in the “establishing the G.I.C. operation” component.

In this context, exploitation of results in G.I.C. lies in sustaining and extending the project activities, so as to secure and feed the centre's operation in the years to come. In particular, G.I.C. outcomes/deliverables are expected to be exploited, and G.I.C. activities are envisaged to be sustained beyond the completion of the project as follows:

- **Training**, including the organization of seminars both in the form of training sessions with invited experts or training visits to research centres, as well as the participation in seminars and workshops, organized by G.I.C. partner organizations will be a **constant process** even after the end of the project, so as to enable the continuous improvement of the G.I.C. know-how and the enhancement of the centre's human resources.
- The **training material** will be used as reference material and will be exploited for training new members of the G.I.C. research team, while the three dedicated interoperability-related courses, developed during the project will be promoted for further inclusion in the academic curricula of national universities aiming to strengthen the know-how and awareness of young scientists on interoperability. Training and educational materials will be further adapted and exploited to address and support the needs of specific stakeholders, e.g. public administrations, enterprises, in particular SMEs etc. that are interested in the benefits of interoperability, within seminars organized by G.I.C.
- Recruitment of researchers or high level managerial **personnel** will take place as per the potential needs of the centre in the years to come.
- The G.I.C. Business Plan itself and the G.I.C. Regional Penetration Strategy, related to the latter, will be used as a guide for co-ordinating the centre's operation in the next 3 years period, with the aim to ensure its sustainability. It will be regularly reviewed and properly updated, if needed, so as to reflect changes in the centre's environment and assess progress achieved versus the set targets.

- **Infrastructural developments** of the centre will keep up with the requirements of the centre's operation and activities as well as the G.I.C. development prospects as reflected in the G.I.C. Business Plan.
- G.I.C., as part of the DSS Laboratory of NTUA will continue to pursue its participation and contribution in interoperability-related **projects**, as well as in relevant **standardization efforts** and initiatives. Involvement in such activities and initiatives is anticipated to enrich the centre's expertise in interoperability-related domains, enhance interoperability considerations in the projects' design and implementation, foster new ideas for further research or the development of interoperability scenarios and demonstrators, inspire the authoring of more publications (e.g. papers in scientific journals and conferences, white papers etc.), while also enabling the establishment of links with research and standardization poles, enhancing thereby the centre's competitiveness.
- Additionally, G.I.C. will carry on monitoring and actively participating where possible in the formulation of the **interoperability policy developments** at national level, and therefore issuing the **Comparative analysis** of Greek ICT policy documents to the European guidelines and policies, in order to ensure that interoperability maintains a high scope in the Greek Information Society vision. More over this analysis will allow the centre to identify specific cases for providing scientific and technical support to national governmental actors as well as industry actors in order to achieve alignment with EU policies and standards and achieve the benefits of interoperability.
- In the same context, the **Interoperability Barometer** mechanism, initiated with the goal to provide consolidated information on the degree of interoperability readiness at regional level, will continue to be regularly updated, while effort will be put on reinforcing its collaborative nature through the participation of partner organizations in the SEE region that will contribute by adding and validating content on the countries' interoperability status.
- The **G.I.C. website**, being also one of the main dissemination tools of the project, will continue to hold value beyond the end of the project, by presenting key interoperability-related news and developments as well as the G.I.C. activities and achievements in interoperability-related fields and projects, while it will be further promoted as a web collaboration platform.
- **Integrating and communicating knowledge** on interoperability-related issues will also be a continuous process, the outcomes of which will be mainly presented through the **Interoperability Guide** series of publications. The latter will be released beyond the end of the project on an ad hoc basis, on the occasion of the collection of sufficient material to be communicated to the appropriate stakeholders, enabling them to tackle specific interoperability issues and providing relevant recommendations, but also fostering for the Greek Interoperability Centre prospects for future collaborations.
- **Dissemination and networking** in terms of participating in national and international conferences and other events, organizing workshops and information events, authoring publications and preparing and distributing dissemination material will carry on as mandated by the needs of the research projects implemented by the centre, its co-operations and the G.I.C. Business Plan.
- GIC – through the course of the project- has managed to establish a reliable, efficient and recognized by its stakeholders **networking/dissemination mechanism** which will be exploited beyond the end of the project. This mechanism includes among other a set of regular activities, indicatively, as follows:

- Issuing regular –as well as ad hoc- Newsletters (quarterly)
- Development of project brochures that create awareness on the activities of the centre within the projects that it is involved in;
- Development of demonstrators' brochures that describe the business case and the benefits of applying interoperability solutions, as highlighted by each demonstrator developed by the GIC;
- Organisation of regular (at least) annual "GIC Interoperability Days": a workshop intended to elaborate a specific interoperability domain (open data, enterprise interoperability, egovernment interoperability etc) with relevant stakeholders from policy, research and industry field. Interoperability Days have been implemented with great success the past 4 years so GIC intends to exploit the recognition built, in order to support continuing implementation of such events.
- Co-Organisation of the Samos Summit, which has been established during the past three years as a series of annual conferences hosting experts consultation sessions and workshops on selected future ICT technologies and research topics. It has built recognition as an event that facilitates fruitful research discussions and networking in the context of presenting highlighted projects' results and engaging a wide audience in relevant discussions.
- Organisation of WeGOV awards, a established annual contest addressed to students and young researchers aiming to promote innovation and support novel business approaches through interoperability solutions.
- **GIC Interoperability demonstrators:** Since the beginning of the project, G.I.C. has been elaborating and developing demonstration scenarios for highlighting interoperability aspects, technology solutions and research directions in e-Government, e-Business and e-Participation application domains. These proof of concept activities, demonstrators and test beds focus on
 - Promoting and advancing interoperability research in the region and in the wider European Research Area.
 - Facilitating the decision making procedures on behalf of businesses or governmental organizations, whose personnel may not have the necessary know how to evaluate them or is not even aware of such solutions, by clarifying the choices at hand.
 - By the end of the project, the G.I.C. has developed a series of interoperability demonstration cases aiming at providing a show case of interoperability technologies and solutions. The following demonstrators are currently available and provide a strong asset for further exploitation by the GIC after the end of the project:
 - eGovernment Service Registry
 - eGovernment Interoperability Standards and Compliance
 - B2B Interoperability Readiness Assessment System (RIASSESS)
 - EGovSimulation Engine: Calculating the Gains for Administrations and Citizens of Governmental Services Transformation towards interoperability
 - Interoperability Barometer
 - The e-Deposit Slip
 - The EXELIXIS: Semantically-enriched Governmental Data Components and XML Schemas Management
 - e-ID Federation: Security Token Service implementation using Windows Identity Framework

- A Social Media collaborative Knowledge Resource Library (wiki)

G.I.C. will continue to build its research image by enhancing and improving the above demonstrators. It will also continue to develop novel demonstration applications, either on its own capacity as a research centre or in collaboration with its partners within Interoperability-related projects to showcase the interoperability aspects/benefits of using their results.

- Finally, G.I.C. will continue to issue the **G.I.C. Activity Report**, an annual release, summarizing the centre's activities and achievements.

In brief, the specification of the work provided within the “establishing the G.I.C. operation” component of the project, extending in the axes of creating training material and interoperability courses, issuing guidelines on interoperability problems, developing interoperability scenarios and demonstrations of real life applications, conducting high level research and providing management and consultancy services in interoperability related projects, ties all project work packages together and renders the work performed so far as a representative, yet also rich, sample of the G.I.C. activities beyond the completion of the project, revealing therefore the way in which project outcomes will be exploited.