Preliminary assessment conducted to launch in Portugal a Fraunhofer Institute for Applied Research on "Technology, Applications and Services for Ambient Assisted Living"

March 2007

1. Proposed Mission

The Institute will undertake applied R&D on technologies, applications and services to exploit how ICTs can contribute to close up the digital divide and to improve the quality of life of all citizens. The Institute will contribute to spread out the effective reach of the Information and Knowledge Society (IKS) by promoting innovative ways to deliver ubiquitous access to ICTs, by fostering the steady deployment of innovative content, applications and services for all and by promoting life-long learning through emerging forms of edutainment. The Institute will devote particular effort towards citizens with low qualification, the elderly and citizens with special needs, who traditionally lag behind in what concerns the advent of the IKS. During the launching phase, the Institute will focus on new technologies and services for places where many people convene, such as shopping malls, and on new technologies and content for virtual, augmented and simulated reality, with application to ambient-assisted living as well as to health-care devices. Achieved developments in this area will be applied to enhance the active capacities of the elderly, to increase the access of people with low qualifications or disabilities to the benefits of information society, and to enrich learning and inclusive environments.

2. Justification

Education determines the extent to which people perceive and derive benefit from using ICTs. Figure 1 shows that only in some northern countries, such as Sweden, Denmark, Finland and Netherlands, people with low qualification use ICTs regularly. In most countries where the percentage of adults with only primary education is higher than EU average, and in particular in Portugal people with primary education lag behind in what concerns adoption and regular use of ICTs. In some countries, such as Greece and Cyprus, regular use of ICTs is significantly low across the whole population.
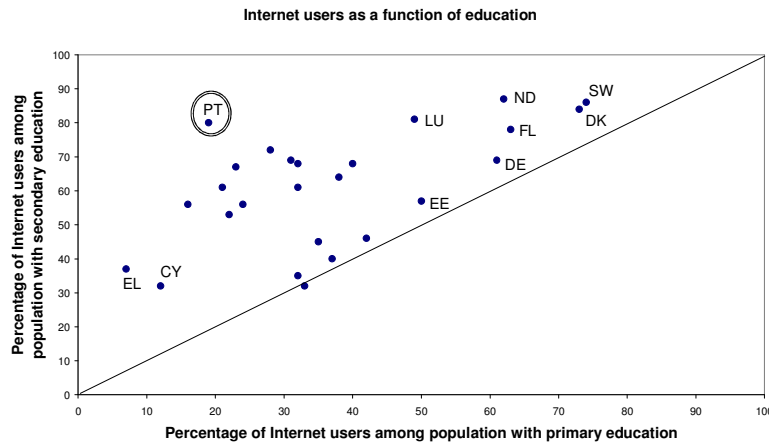

Figure 1 - Internet users as a function of education (source of data: Eurostat, 2006).
(Internet usage measured by using on average at least once a week)

There is thus a pressing need to better understand how ICTs can accelerate bridging the digital divide, by involving more people with fewer qualifications in the IKS, namely by promoting the use of innovative applications and devices, and how the **regular use of ICTs can provide a framework for qualifying** these citizens on a regular basis. Recent developments in the field of human-machine interaction, namely new interfaces and applications for 3D-visualization for gaming and entertainment, can be applied to develop innovative tools for education and training that stimulate active learning and thus enhance the effectiveness of traditional learning environments. The vast network of Community Technology Centers (CTCs) in the US, which aims at empowering people with equitable access to ICTs and with the necessary skills to use these technologies meaningfully, provides a benchmark in this regard.

Wealth also helps determine the extent to which people engage in the IKS. Those with fewer qualifications, who face special difficulties in using computers and the Internet, perceive little benefit from using ICTs, and rather spend their income on more essential goods. Bringing these people to the realm of the IKS is paramount for inclusive social development. This can be mostly achieved by designing new easy-to-use applications and services, that can be flexibly adapted to particular user groups needs and interests, to help navigating through an ever more connected world. Applying such innovations to those with fewer qualifications can provide a means for making these people more comfortable with using ICTs.

In parallel, most **forecasts show that aging rests upon Europe as a whole**, as in other large regions of the world. Effective new devices and applications targeted to the elderly benefit from the opportunities provided by a large and expanding global market. Figure 2 shows that, on average, the number of elderly persons per working person in Europe will more than double during the first half of the XXI Century. But, ICTs can provide the right tools to assist the elderly and citizens with special needs to participate more fully in their jobs and in their private lives. ICTs, namely technical aids, can help the elderly to better appreciate their retirement options, tourism in particular, and to extend their active participation in society and the economy. ICTs can also help citizens with disabilities to engage more easily in their jobs through teleworking.
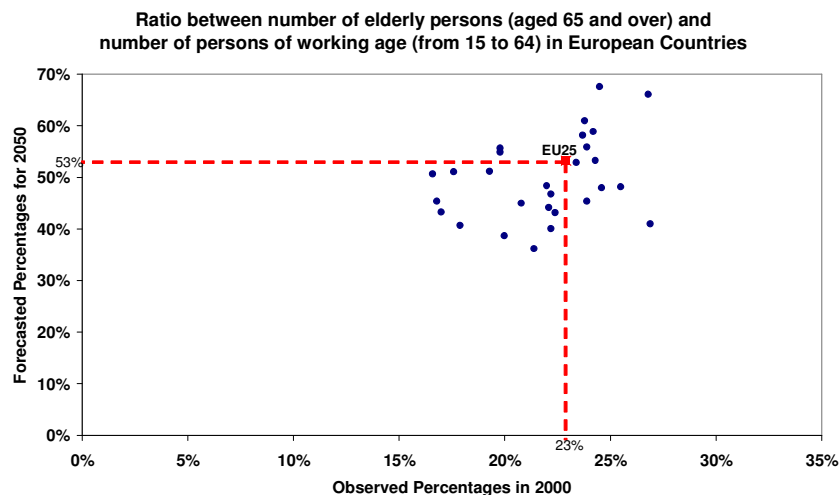

Figure 2 - Aging in European Countries (source of data: Eurostat, 2006).

Technology developed for this purpose will also support social interaction with family and others and will have direct application to virtual teams and organizations. Further applied research and development on these technologies can have direct application for virtual, augmented and simulated reality. In fact, these technologies can help everyone navigate in today's world making use of more intelligent environments, which embed smart interactive devices to provide increased quality of life and comfort.

3. Positioning and Rational for Activities

The new Institute will **study, develop and experiment**, innovative ways to integrate more citizens into the realm of the IKS, with particular application to **Southern and Eastern European countries**, by finding and promoting ways in which ICTs can effectively bring added value to the life of the info-excluded citizens. Most elderly are usually retired and the less skilled are typically unemployed or earn little income. Both are seldom found among the first willing to pay to use ICTs, unless these technologies allow them to become part of meaningful online communities or to extend their active roles in society or the economy.

The new Institute will contribute to stimulate building such communities by developing, and by supporting the **development of, new applications, content and services, with special focus on "social-construction" platforms and location based services**, and by promoting emerging forms of both entertainment and edutainment. Innovative applications and devices developed by these industries, including new interfaces controlled by voice, gesture, vision and the brain, will be used to promote new ways of education and training that better stimulate learning. Potential applications at the launching phase can also include advanced technologies and services for places where many people convene, such as shopping malls, which can be expanded to ambient-assisted living and health care devices.

While delving into this new technological wave, the new Institute must account for the accelerated convergence among digital TV, mobile phones and personal computers. New applications and devices that can bring new content and services closer to the end-user, by providing ubiquitous access through interoperable and unified platforms, can contribute significantly to enhance the active capacities of the elderly, to increase the access of people with low qualification or disabilities to the benefits of information society and to enrich learning environments.

In addition, the new Institute will contribute to develop a better understanding of what public policies can help close up the digital divide, by devoting significant resources to **study the relationship between e-inclusion, education**, aging and wealth creation. It must thus operate in close relationship with governments, namely through agencies that foster the development of the IKS.

The new Institute will **focus activity on large markets** that given the right incentives to adhere to the IKS can surely heave very attractive earnings. The Institute will help firms tap these markets by developing applied research and development on high-tech products expected to mature into marketable products. The activities developed will be of major interest to firms in the telecommunications industry and in the services sector, namely to Internet service and content providers. All knowledge created will also be of

extreme relevance to develop applications for those already familiar with the information age, as the principles used for deploying ubiquitous access and user-friendly services may easily apply, and thus spillover, to the entire society, within and across borders.

The new Institute will devote significant effort to contribute for the steady development and growth of an industry of information technology, content and services. To this end, two complementary driving forces must emerge in Portugal. First, there is a need to foster the development of **digital content that triggers innovative services**. Annex E lists some of the most successful firms that provide digital content and services worldwide. Most of them offer integrated suits of services, such as news, email, search, instant messaging and targeted advertisement. In addition, e-Bay provides the largest online e-commerce website in the world, which yet provides a new way for people to communicate, interact and create added value.

However, most of these information and services providers, most notably Yahoo!, MSN and Google, rely on third-party content and, currently, have more users than traditional information sites such as The New York Times and BBC (also listed in Annex E). In fact, there is a growing industry that provides easy-to-use tools for people to develop and upload their own content and thus build online communities. Annex F lists some of the most popular **websites for social construction and online networking**. These websites are meeting points for communities of users that post information online, in the form of text, audio and video, and thus exchange ideas, experiences and knowledge. The rapid growing success of these sites shows that significant potential to create and develop attractive content lies with the users themselves, who must thus become empowered to do so in sound legal ways.

Despite the growing number of such popular websites and online services, the digital divide still lingers. In fact, these tools provide additional ways to connect those who are already familiar with ICTs, but they fail to reach out to society at large, namely to those with lower qualifications. In truth, there is still significant lack of knowledge about how digital inclusion works and how new contents and services can effectively generate enough benefit to attract the bulk of the info-excluded citizens. The **new Institute will contribute to create and develop the knowledge needed** by devoting particular emphasis to applied research and development. The Institute will apply this knowledge to policy-making, through its tight relationship to the government, and to the commercialization of innovative technology, content and services, through its partnerships with a number of firms.

Finally, by contributing to improve the access and use of ICT to the population as a whole, the new Institute will help provide firms with a more skilled and resourceful workforce, which ultimately will have a positive impact on labor productivity, economic growth and quality of life. In addition, and by promoting the regular use of ICTs by all, the Institute will also foster access and use of knowledge and life-long learning.

4. International Benchmark

Annex A presents a list of international institutes and projects that address questions related to the digital divide. **Relatively few of these are located in Europe.** Most of the institutes worldwide develop substantial knowledge on frameworks and theories that explain the digital divide and help to consistently monitor the progress of the IKS. Most of them are hosted at universities, or develop under the auspices of governmental agencies, and thus focus on study and analysis but **lack the operation needed to identify, develop and implement technology to bridge the digital gap** and to fully contribute to the effective development and growth of the IKS.

In the US, most institutes that look at the digital divide are associated with universities, or located in either Washington DC or California. These institutes devote significant effort to study and observe the development of the IKS. Most of their output is in the form of policy briefs to inform decision-making at the governmental level, both locally and nationally. Examples of such institutions include the **Pew Research Center** and **RAND Corporation**. A few institutions focus on closing the gap to less-favored people around the world and run large operations with numerous partners. Examples of such institutions include the **Center for the Digital Future** and the **Center to Bridge the Digital Divide**. Finally, the **AgeLab at MIT** develops new technology and works with business partners to translate it into practical solutions that improve people's health and quality of life throughout the lifespan, in addition to building theory and to informing public policy.

In Europe, **IT4All** is a Spanish based initiative that connects local authorities, cities and regions to exchange experiences in fostering ICTs for all. The remaining relevant institutes that look at the issue of digital inclusion and development are located in the UK, Netherlands and Sweden. In the UK, **DEMOS** is concerned with active citizenship and promotes the use of ICTs to enhance participation and democracy. In Holland, **UNU-MERIT** is concerned with how ICTs can help solve problems of human survival, development and welfare. Finally, the **Swedish Handicap Institute** focuses on assistive technology and on accessibility for persons with disabilities. These institutes address concerns of countries where ICTs are already very much entrenched in people's lives and do not contribute directly to help close up the digital divide in Europe as a whole by fostering the regular use of ICTs by citizens with low qualification and by using ICTs to qualify Europe's population. Thus, **the new Institute has a very well defined scope for action yet to be addressed in the European context.**

5. Relevant Fraunhofer Institutes

Annex B lists Fraunhofer Institutes whose expertise can be valuable to the new Institute. The **Fraunhofer Institute for Applied Information Technology (FIT)** investigates human-centered computing. It contributes to improve the usability and usefulness of information systems as well as to enhance human ability through flexible, context-adaptive information systems. In addition, FIT develops technology to assist the elderly and the handicapped to participate more fully in their jobs and in their private lives.

The **Fraunhofer Institute for Communication Systems (ESK)** develops applied research in devices and services that automatically adapt to the individual needs of users and to specific environments. It also focuses on reliable, easy-to-manage, cost-effective networks, through the integration of Internet access, video and voice services using both wired and wireless systems and on communications solutions for the workplace, including VoIP and unified messaging. Finally, ESK also develops applied research on ubiquitous communications solutions for the home and office, in addition to designing network solutions at the access and metro levels.

The **Fraunhofer Telecommunications Heinrich-Hertz Institute (HHI)** develops significant research in photonic networks and systems, electronic imaging for multimedia, and in broadband and mobile systems to provide information services over broadband. HHI has a vast expertise in high-capacity optical networks, broadband access networks, image processing and computer vision, interactive media, and human-machine interaction.

The **Fraunhofer Institute for Computer Graphics (IGD)** focuses on the development of prototypes and interactive multimedia applications for ambient intelligence. It also focuses on the realization of concepts, models, and solutions for computer graphics and on their adaptation to specific application requirements. IGD also realizes single devices and computer graphics systems with pilot character applied to virtual and augmented reality, mobile computing, and security technologies.

The **Fraunhofer Open Communications Systems Institute (FOKUS)** develops seamless personalizable communication systems, following an I-centric Communication model, which takes the individual user and the user's own personal communication preferences as the springboard for future technology and application development. FOKUS develops highly-flexible, cost-effective standard-based solutions suitable for a wide range of uses. It also delivers compliance of proprietary systems with standards, integration of heterogeneous systems in common run-time environment, management environments for complex infrastructures and innovative services, such as facility management, media and entertainment content. FOKUS also develops and implements IP-based communication infrastructures and services, namely in UMTS/3G, satellite services and machine-to-machine communication.

The applied research and the technology developed in the above mentioned Institutes can have direct and immediate application to promote digital inclusion. The Fraunhofer Society as a whole has already accumulated a vast expertise in managing ICTs that can be rapidly put into practice and have a very positive impact on closing the digital divide and, therefore, the web of distributed knowledge developed at these Institutes is the best context to raise the new Institute. Effective collaboration between the new Institute and other Fraunhofer institutes must be straightforward to implement. In addition, the new Institute will, per si, **launch new activities at the Fraunhofer Society and contribute to extend its scope outside Germany, particularly to Southern and Eastern Europe**.

6. Why a new Fraunhofer Institute? And why in Portugal?

The new Institute will focus on a **new research area** for the Fraunhofer Society and will thus contribute to enlarge its expertise into a very relevant field for the future of

Europe. Choosing to locate this Institute in Portugal will place it at the very heart of the issues at stake, therefore facilitating experimentation and learning.

In Europe, most institutes developed to address the issues of digital inclusion focus on study and analysis leaving behind the actual development, implementation and testing of new technologies to help close up the digital divide. The new Institute can resort to the vast experience of the Fraunhofer Society to develop applied research and to take inventions all the way to the marketplace where they can finally have a real impact on society at large. Digital inclusion can benefit from smart ambient technology that helps people navigate in today's intricate environment at the same time they get acquainted with innovations in ICTs.

In this way, and also by strategically using technology developed at existing Fraunhofer Institutes to facilitate the integration of citizens with low qualification, the elderly and citizens with special needs, into the IKS, the new Institute will provide an innovative approach to help bridge the digital divide in Europe and must therefore become an international landmark for promoting social cohesion through ICTs and learning. In addition, the new Institute will, per se, **launch new activities at the Fraunhofer Society and contribute to extend its scope outside Germany, particularly to southern and eastern Europe**.

The new Institute must be developed in close relationship to the government, firms and research centers in universities. In what concerns the relationship to the government, the new Institute must be launched in close cooperation with the Portuguese government Agency for the Knowledge Society - UMIC, in ways that can complement current activity to foster the development of the IKS in Portugal. This agency has a long tradition in promoting digital inclusion, namely through projects targeted at integrating citizens with special needs, as listed in Annex D.

During the launching phase, the new Institute will focus on technology, content and services for places where many people convene, namely to shopping malls. Sonae, through Sonae Sierra, could be a prime partner at this stage and contacts should be established in that direction. At later stages, the new Institute can focus on technology for households, namely for homes for the elderly, for the poor, and for the workplace, which are European-wide markets that many firms of different sizes and scopes, including large firms such as Siemens, Philips and SAP, can be interested in addressing jointly. Further research and development on these technologies can have direct application for virtual, augmented and simulated reality prompting the development of "intelligent-ambient" solutions.

Other firms that, in Portugal, develop relevant applied research and development for the new Institute include, at least, Sonaecom, PT - Comunicações, REFER Telecom, Brisa and REN for ubiquitous deployment of backbone connectivity; PT - Inovação, ONI, Rádio Móvel, ARTELECOM and Sonaecom for the deployment of local loop access, and terminal vendors, such as IBM, Toshiba, Sony and Motorola. CISCO Systems and Alcatel should also be considered prime partners in what concerns all switching equipment and facilities. At the services layer, interesting firms include content providers, such as RTP, SIC, TVI, Microsoft and creative companies like YDreams and

Research centers with significant competence in areas of interest to the new Institute include INESC-ID in Lisbon, INESC-PORTO in Oporto, the Institute for Systems and Robotics (ISR) in Lisbon and in Coimbra, the Institute for Telecommunications (IT) in Lisbon and in Aveiro, the IPP Hurray Center and the Knowledge Engineering and Decision Support Group at the Polytechnic Institute of Oporto, the Rehabilitation Engineering Center at the University of Trás-os-Montes, the Algoritmi Center at the University of Minho, the Institute of Electronics and Telematics Engineering of Aveiro at the University of Aveiro, the Large-Scale Informatics Systems Laboratory at the University of Lisboa, the Artificial Intelligence and Computer Science Laboratory at the University of Oporto and the Research Center for Informatics and Information Technologies at the New University of Lisbon. Annex C describes these institutions and lists their main competences.

7. Tentative Structure, Budget and Funding Model

The Institute may be launched with three areas of expertise, namely:

- ICTs for places where many people convene (e.g. shopping malls);
- ICTs for the young and less qualified citizens;
- ICTs to assist the elderly and the citizens with special needs;

Three departments of activity will cut across these areas of expertise, namely public policy, research and innovation. The **Public Policy department** will develop detailed knowledge about the tools that governments can use to accelerate and spread out the benefits inherent to the IKS. This department will be in charged of the relationship to governmental agencies. The **Research department** will address fundamental questions and conceptual frameworks for the inclusive development of the IKS and will promote joint work with both universities and research centers. Finally, the **Innovation department** will work together with firms on pilot-projects to mature products into the marketplace.

The Institute is designed to operate in close relationship with both governments and firms in establishing a coherent research agenda and experimentation projects to help bridge the digital divide and produce innovative solutions for ambient-assisted living. **Following the structure of other Fraunhofer Institutes**, the new Institute should employ about **30 senior researchers by 2009**, to be recruited internationally on a competitive basis, 40% with doctoral degrees. 80% of the employees must have engineering degrees. Other expertise should include designers, sociologists, psychologists and business managers able to establish and supervise tight relationships to firms.

Following the current practice of other Fraunhofer Institutes, after the a few years of operation, a third of the Institute's revenue must derive from contracts with the industry targeted at developing marketable products. Firms acting in the scope of the telecommunications industry, namely Internet service and content providers and appliance and device developers, must be among the prime partners. Firms in all services sector must have interest in the activities of the new Institute and must also provide revenue through contract research.

Another third of the Institute's budget must come from publicly financed research on a competitive basis, namely from national and European funding programs. Most of the research developed will be of interest to the European Commission, namely to DGINFSO. Also, the generalization of all research conducted, and its application across regions, must also interest foreign governments and thus foreign institutional revenue must also be considered as a source of funding.

The remaining third of the funding will be provided by base governmental grants, similarly to other Fraunhofer Institutes.

The Institute will engage in fundamental research on issues that frame the whole research agenda of the Institute and that appear to have significant bearing on the future of ICTs and of content and services over broadband. The Institute will devote significant resources to address e-Inclusion in the context of countries where people with low qualifications account for most of the info-excluded, who, in general, also constitute the bulk of a low-skilled workforce. Portugal lies among this set of countries and, hence, the choice to locate the Institute in Portugal opens up the opportunity to learn from the Portuguese experience by working closely with the government to develop specific research and public policies applied to Portugal.

8. Proposed Calendar

The following calendar can be used to proceed with the tasks needed to launch the new Institute:

1. April 2007	Signing of MoU for launch Appointment of starting team
2. March – May 2007:	Meetings with potential partners Validation of funding model Definition of installation plan Definition of start-up projects
3. May 2007:	Starting team presents report Partners evaluate and decide
4. June-September 2007:	Installation plan begins Hiring process (human resources) strats
5. October-November 2007	Formal approval by Fraunhofer supervisory boards ("Senate" and Federal/State Government Council)
6. November-December 2007	Establish all operational needs. Launch first set of R&D projects Engage partners in activities/projects
7. January 2008	Formal launch of the new Institute

The preparation of an initial proposal and the identification of potential industrial partners are currently underway. A MoU between the Portuguese Government and The Fraunhofer Society should be signed in April 2007 appointing a starting team to define and to detail all aspects of the new Institute, including plans for positioning, structure and operation. This team must meet with all potential partners in order to establish effective partnerships that allow for validating the funding model envisioned. In parallel, the team must also define the first set of R&D projects to be launched within the new Institute.

By early May 2007, the starting team presents a report to the partners who evaluate and decide about launching the new Institute. Iterations on the report are expected to take place until the end of May 2007. The installation plan must then ensue to guarantee that the new Institute is fully operational by January 2008. The first cohort of human resources must be hired between June and September. These people will work on establishing the foundations for the new Institute, which include setting up all operational needs and launching the Institute's website. Between November and December the first set of projects much be launched and all partnerships must be activated. In January 2008, the new Institute must be formally launched with operations already in full swing.

LIST OF ANNEXES INCLUDED (with page numbers):

A. Summary table of International Institutes working on issues related to the digital divide

IN EUROPE:

Institute	Mission	Structure	Main Projects and Funding
UNU-MERIT United Nations University University of Maastricht (Maastricht, Holland) http://www.merit.unu.edu	UNU is an international community of scholars engaged in research, postgraduate training and the dissemination of knowledge aimed at resolving the pressing global problems of human survival, development and welfare. UNU-MERIT's research mission is to provide more insights into the social, political and economic international and local context within which innovation and technological change is created, adapted, selected, diffused, and improved upon. The Institute's research and training programs address a broad range of policy questions dealing with the national and international governance of innovation and intellectual property protection, and the creation and diffusion of knowledge.	UNU-MERIT is a research and training centre of United Nations University (UNU). UNU-MERIT was formally established on January 1st 2006 following the integration of the former UNU - Institute for New Technologies (INTECH) in Maastricht and the Maastricht Economic Research Institute on Innovation and Technology, MERIT. UNU-MERIT is located at, and works in close collaboration with the University of Maastricht. UNU – MERIT is managed by 3 directors. It includes 11 administrative support staff, 2 technical Staff, 13 professorial fellows, 29 research staff, 42 PhD researchers and 6 visiting researchers, for a total of more than 100 people.	UNU-MERIT's research programme is organized around f5 research themes based on broadly common methodological approaches: (a) Micro-based evidence research on innovation and technological change; (b) The role of technology in growth and development; (c) Knowledge and industrial dynamics; (d) Innovation, global business strategies and host country development; (e) The governance of science technology and innovation.
DEMOS (London, UK) http://www.demos.co.uk	Demos is the think tank for everyday democracy. Everyone should be able to make personal choices that contribute to common good. Demos aim is to set up this democratic ideal by working with organizations to make them more effective and legitimate. DEMOS analyses social and political change, connecting it to innovation and learning in organisations, helping partners show leadership and respond to emerging policy challenges.	DEMOS counts on a Board of Trustees with 6 members. It employs 16 staff people, 7 researchers, 28 regular research associates and another 134 contributors. Demos's international partners include the Open Society Institute, the City of Athens, the Government of Italy, Demos Athens, the International Olympic Truce Centre, the European Space Agency, the International Olympic Committee (IOC), The Education Foundation in Australia, the Victoria Curriculum and Assessment Authority in Australia, the Netherlands Ministry of Justice, the OECD, The British Council in	DEMOS focus on public services; S&T; cities and public space; arts and culture; global security, public communication. <u>Current Live Projects</u> (30): Happy Families; Demos and the Olympics; The Network Effect; Professional Authority; Confronting the Skills Paradox (adult learning); Cool Tools for Government; Knowledge and Inspiration (museums, libraries and archives); Quality Assurance; Talk us into it; The Future of the English Language; Cultural Diplomacy; Demos 2050; Trust and local government; Demos Podcasts; Digital Curriculum Project; New directions for public

		Belgium and Finland, Sitra, the Canadian High Commission, The Electoral Commission, the Ashden Trust, the International Peace Academy, KaosPilots and Pioneers for Change, as well as a number of FTSE 100 companies.	services; Emerging Ideas; Beyond Inclusion; Atlas of Ideas; Future Planners; The Collaborative State Collection; Demos Website; Greening Up Demos; Experts; The Nanodialogues; Glasgow 2020; The Journey to the Interface project; The Business of Resilience; The Other Glass Ceiling; and Tackling the New Terror Threat. Selected grants and contracts (2004): National College for School Leadership; Department for Education and Skills; Electoral Commission; Scope; Heritage Lottery Fund; BP; Shell; Orange; European Social Research Council; Environment Agency; The Joseph Rowntree Foundation; AOL; Discovery Europe; IKEA.
IT4All (Bilbao, Spain) http://www.it4all-regions.org	IT4All is a Network of Local Authorities for the Information Society designed to ensure the effective cooperation of Local Authorities around the World to enable all people to access the Information Society, promoting e-inclusion policies and decentralized cooperation in digital terms. The Bilbao Summit resulted in a Preliminary Plan of Action (a) To develop Digital Local Agendas; (b) To promote Digital Solidarity; (c) To strengthen the role of the Local Authorities in the Information Society; (d) To create new decentralised instruments for digital cooperation and solidarity.	UNITAR, the United Nations Institute for Training and Research has been entrusted with creating a framework for the participation of the local authorities of the world in the WSIS. CIFAL BILBAO, under the auspices of the CIFAL Program of UNITAR, is a joint initiative of UNITAR and the Basque Public Authorities (Basque Government and Bizkaia Regional Government). There are 4 Regional Nodes Coordinators: For Africa is the region of Dakar; For Latin America and the Caribbean is the City of São Paulo, For the Asia-Pacific Region is CITYNET; For Europe, eris@.	The main courses of action are the following: (a) Identification of potential cooperation projects with high impact on the development of the Information Society (IS) and that may be extrapolated to a wide group of regions; (b) Design and communication of a reference model, based on the good practices of local authorities, serving as a guideline to diagnose and draw up local adaptation strategies to the IS; (c) Implementation of training actions to raise awareness and training of those locally responsible for the introduction of the IS; (d) Support for securing funding for development of IS projects in less developed regions. Sponsors: UNITAR and CIFAL.
Swedish Handicap Institute (Vällingby, Sweden) http://www.hi.se/	The Swedish Handicap Institute (SHI) is a national resource centre on assistive technology and accessibility for persons with disabilities. SHI works for full participation and equality for persons with disabilities by ensuring access to high-quality assistive	The Institute has a staff of about 90 people representing different professions such as technicians, physio-therapists and occupational therapists, architects, behavioural scientists, information officers, economists and social scientists.	The activities of the Swedish Handicap Institute cover: (a) testing and procurement of assistive devices; (b) research and development; (c) analyses of needs, knowledge and method development; (d) training and capacity building; (e)

	technology, an effective provision of assistive devices and an accessible environment.	The Institute has an extensive international network and is involved in international research projects, most funded by the European Union and in promoting appropriate technology for people with disabilities in Low and Middle Income Countries (done in cooperation with local governments and WHO).	international cooperation; (f) information The Swedish Handicap Institute is run by the Ministry of Health and Social Affairs, the Federation of Swedish County Councils and the Swedish Association of Local Authorities

IN THE US:

AgeLab Massachusetts Institute of Technology (Boston, US) http://web.mit.edu/agelab	The AgeLab was created to invent new ideas and creatively translate technologies into practical solutions that improve people's health and enable them to "do things" throughout the lifespan. AgeLab works with business partners to translate ideas into practical solutions that improve people's lives. All activities aim to contribute to the quality of life of people throughout the lifespan while building theory, creating business opportunity and informing public policy.	AgeLab employs 42 faculty and researchers, 11 students and 2 staff people in three interrelated and mutually reinforcing approaches: Field Research, Theoretical Models, and Laboratory Experiments. Field data are used to generate predictions for lab experiments, and to serve as the basis for preliminary models. Laboratory experiments allow researchers to replicate phenomena that were observed in the field research, and to test predictions derived from the theoretical models. The theoretical models are updated with data from the lab and field studies. The AgeLab maintains and is actively developing one of the world's largest knowledge bases on older adult and caregiver behavior in a variety of setting from driving, to health behaviors to the adoption of new technology.	Main Projects: Driving and Personal Mobility; National Older Driver Safety Advisory Council; Wellness and Self-Empowered Health; Independent Living and Caregiving; Business Strategy and Policy Innovation. Laboratory Sponsors: AARP; AARP Services Incorporated; Blue Cross/Blue Shield of Massachusetts; BMW, Computerized Screening, Inc.; DGIST – Korea, EDS, Ford Motor Company; The Hartford Financial Services Group; The Hartford Life Company; Healthways; Johnson & Johnson; Masterfoods, NeuroDyne Medical Corp.; Nissan Motor Co., Ltd; Partners HealthCare; Toyota Motor Corporation; U.S. Department of Transportation; Volkswagen.
Center for the Digital Future University of Southern California (Los Angeles, US) www.digitalcenter.org	The Center for the Digital Future is a research and policy institute committed to doing work that has a real and beneficial effect on people's lives, while seeking to maximize the positive potential of the mass media and our rapidly evolving communication technologies. In addition to its flagship surveys of America's involvement with the Internet and digital		Main Projects: (a) Surveying the Digital Future: A Longitudinal International Study of the Individual and Social Effects of PCs and Internet Technology; (b) The World Internet Project; (C) Television Violence Monitoring Reports. Corporate and Foundation Sponsors: Accenture; America Online; The Coca-Cola

	media, the Center administers the complementary World Internet Project in two dozen countries, manages the Annenberg School's On-line Communities Project, and surveys Internet use by military personnel for the U.S. DoD. The Center is guided by the belief that the crucial issues encountered at today's digital and Internet frontiers are of vital interest to the wider community.		Company; Microsoft; SBC; Sony, Time Warner Companies, Verizon; Compete, Inc. International Partners: Major universities in Argentina, Australia, Bolivia, Canada, Chile, China, Czech Republic, Estonia, France, Germany, UK, Hong Kong, Hungary, India,, Iran, Italy, Japan, Macau, Portugal, Singapore, South Korea, Spain, Sweden and Taiwan.
Telecommunications & Information Policy Institute University of Texas (Austin, US) www.utexas.edu/research/tipi	The Telecommunications and Information Policy Institute (TIPI) was established in May 1996 by the University of Texas at Austin. It plays a key role in advising both the public and private sectors in setting priorities and allocating resources at the state, national and international levels. As an interdisciplinary institute, TIPI engages faculty scholars from diverse colleges and departments from the University and various institutions of higher education worldwide. TIPI faculty associates assist in the design and implementation of policy analysis.	The Institute is managed by a board of 3 directors and employs 13 researchers.	TIPI provides a research-based program and a forum for digital information policy in the United States and around the world. Through a series of conferences, policy briefs, surveys and research reports, TIPI connects researchers, public officials and industry representatives with vital information and analyses. Using a multidisciplinary approach, TIPI staff and researchers investigate the role of new technologies in modern societies. With an eye toward informing public policy, TIPI addresses issues of international strategy, community and economic development, and applied technologies, particularly in the areas of tele-health and information access.
Center to Bridge the Digital Divide Washington State University (Pullman, US) http://cbdd.wsu.eud	Mission and driving motivation is to make a difference in the lives of ordinary people around the world through enabling them to more effectively access and utilize modern information technologies. The Center works directly with youth in understanding and using digital technologies and supports key institutions such as schools to more fully engage with the needs of rural communities struggling with new approaches for viability and sustainability in a shifting global economy. The Center partners with the business community to pursue new options by expanding both markets and workforce	CBDD accomplishes the majority of its work through ongoing relationships with project partners. Partners include over 20 African universities participating in the Nettel@Africa initiative, 6 schools and communities leading the Connecting Schools and Communities initiative, and various other individuals and groups with whom we collaborate. Within WSU, CBDD currently collaborates with a growing list of academic faculties, research and service centers, and organizations. Staff includes 14 people.	Current initiatives: e-Work; 4-H Technology; Afghan eQuality Alliances; Rwanda Youth For Business Information and Technology (BIT) Initiative; Rwanda Last Mile Initiative Technology Mentoring; Connecting Schools and Communities; Witwatersrand Partnership; eLearning Institute; NetTel; NetTom; Kelp (Knowledge Exchange and Learning Partnership); Funding: CBDD generate funds from external sources to be fully financially self-sustaining. CBDD has received support from over 20 funding sponsors including multi-million

	resources through utilizing web-based technologies. The Center serves as advisers to governments both locally and globally helping shape public policy to improve the access and beneficial utilization of information technologies among citizens.		dollar grants from the Bill and Melinda Gates Foundation and the US Agency for International Development. CBDD is also creating a new line of direct services.
Digital Divide Network (Newton, Massachusetts) http://www.digitaldivide.net	The Digital Divide Network was launched in December 1999 as a response to the National Digital Divide Summit hosted by U.S. Pres. Bill Clinton. DDN was designed as an online clearinghouse of news and resources on the digital divide. In February 2003, DDN became part of the new Center for Media & Community (CMC) and unveiled a new Digital Divide Network website: an interactive online community featuring an array of interactive collaboration tools to help digital divide activists around the world to work together.	DDN employs 5 people.	DDN offers its members free blogging, news and articles on the digital divide, event announcements, discussion boards and other tools. Membership is free and open to anyone interested in bridging the digital divide. DDN is also home to the DIGITALDIVIDE email discussion group, the Internet's largest email forum for discussing digital divide issues. Sponsors: Annie E. Casey Foundation; Benton Foundation; Time Warner Foundation.
World Resources Institute (Washington DC, US) www.digitaldividend.org	To identify and promote sustainable solutions for bridging the global digital divide, catalyzing large-scale use of information and communication technologies (ICTs) to create social and economic "dividends" in poor communities throughout the developing world.	Director, Deputy Director and a few research analysts.	WRI provides information services, including clearinghouse project data and analysis, full-length business case studies, news alerts, and strategy consulting to help: (a) companies provide critical information, tools, and services to poor communities throughout the developing world—profitably; (b) development agencies implement bottom-up strategies for improving the effectiveness of their services, and for providing services more sustainably; and (c) Grassroots NGOs and entrepreneurs identify and refine promising business models as well as locate sources of funding and other support they need to go to scale. Sponsors: Infodev and Microsoft.

| **The Development Gateway** (Washington DC, US) www.developmentgateway.org | The Development Gateway puts the Internet to work for developing countries. It provides innovative Internet solutions for effective aid and e-government – increasing access to critical information, building local capacity and bringing partners together for positive change.

To ensure the greatest impact for donor resources, we (a) Identify demand by engaging with international and local development leaders; (b) Define and develop solutions together with them; (c) Operate on the ground only where we have dedicated local partners; (d) Help our partners mobilize resources to sustain and scale up joint initiatives; (e) Replicate successful solutions from one country to another. | The Development Gateway was initiated by the World Bank and became an independent foundation in 2001. Donors and sponsors include governments, intl. institutions and private entities. About 40 employees work with partners in: Europe and Central Asia – Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Georgia, Greece, Kyrgyzstan, Moldova, Poland, Romania, Russia, Spain (Catalonia), Tajikistan, Turkey, Ukraine, Uzbekistan; Asia and the Pacific – Australia, Bangladesh, China, India, Korea, Mongolia, Nepal, Sri Lanka, Vietnam; Latin America and the Caribbean – Argentina, Bolivia, Chile, Colombia, Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Uruguay, Venezuela; Africa and the Middle East – Benin, Cape Verde, Ethiopia, Israel, Kenya, Lebanon, Mali, Mauritania, Mauritius, Morocco, Mozambique, Nigeria, Palestinian Territory, Rwanda, Senegal, Tanzania, Uganda. | Projects: four core programs, two joint programs, and the Development Gateway Forum and Award.

Programs: (a) dgCommunities platform: online communities of practice focused on approximately 30 critical development topics; (b) The Country Gateways Program supports a network of 50 locally owned social enterprises established with initial assistance from the Development Gateway to provide web portals and related services for local development needs; (c) dgMarket is a multilingual, online government tender information system; d) Aid Effectiveness Tools help governments, development organizations and others to coordinate aid and reduce waste and overlap; (e) e-Government Grants Program provides seed funding for targeted e-government projects that are part of recipient countries' national e-government strategies; and (f) Research and Training Centers established for this purpose by the governments of China, India, Rwanda and Korea.

Donors: Governments (75.1%) – Australia, Canada, China, Germany, India, Italy, Japan, Korea, Luxembourg, Netherlands, Pakistan, Rwanda, German States of Bavaria and North Rhine-Westphalia; International Organizations – United Nations Development Programme, World Bank (15%); Private Sector And Individuals – Michael Bloomberg, Global Partners Bayern e.V., The William and Flora Hewllet Foudation, IBM; Intel, MAC Holdings America, Inc., Microsoft; MphasiS and Deutsche Telecom. |

Pew Research Center (Washington DC, US) www.pewinternet.org	The Pew Internet & American Life Project produces reports that explore the impact of the Internet on families, communities, work and home, daily life, education, health care, and civic and political life. The Project aims to be an authoritative source on the evolution of the Internet through collection of data and analysis of real-world developments as they affect the virtual world. Data collection is supplemented with research from government agencies, academia, and other expert venues. The Project releases 15-20 pieces of research a year, varying in size, scope, and ambition.	Staff: Pew has an advisory board with 12 members (including Esther Dyson, Larry Irving, Adam Clayton Powell III and Jonathan Zittrain), a project director and manager, 2 senior research fellows, 2 associate directors and 2 senior research specialists.	Reports fit loosely into eleven topic areas: Online Activities & Pursuits; Technology & Media Use; Health; Internet Evolution; Family, Friends & Community; Major News Events; Demographics; Education; Public Policy; E-Gov & E-Policy; and Work. Support is provided by The Pew Charitable Trusts. which is the sole beneficiary of seven charitable funds established by two sons and two daughters of Sun Oil Company founder Joseph N. Pew and his wife, Mary Anderson Pew, between 1948 and 1979, with the goal of contributing to the public's health and welfare, as well as strengthening the communities in which we live.
Community Technology Foundation (San Francisco, US) www.zerodivide.org	CTF works to improve the lives of Californians by increasing access to ICTs by and for underserved communities. Philosophy: technology is not an end in itself, but the key that unlocks communication, knowledge, and access to services that promote social justice and improve critical educational, economic development, health, employment, political, and cultural dimensions of community life. The Foundation values include Inclusion and Accessibility; Community-based Approaches; and Collaboration.	The Community Technology Foundation of California is an unprecedented public foundation investing in community technology for access, equity and social justice for California's underserved communities. It was founded in 1998 through a groundbreaking partnership of 134 community organizations and leaders resulting from the merger of Pacific Bell and SBC Communications. The Foundation is managed by a board of 15 directors.	CTFC's grantmaking focuses on the following two areas: Program and ICT Policy. Applications for proposals are accepted on an ongoing basis. Program grants are awarded quarterly while policy grants are awarded twice a year. Initiatives: ZeroDivide Fellowship; Digital Storytelling Institute; and Hip Hop for Social Justice Sponsors: Personal and Corporate Donors.
OneVillage Foundation (San Jose, US)	OVF sees the challenge and opportunity of using ICT to address World Urgent Issues, by providing a platform for an integrated approach to sustainable development.	OVF employs a dozen people. Partners: United Through Sport (Ghana, South Africa and Costa Rica), Advanced Asian Research and Language Initiative (study programs in	OVF seeks to assist people in Africa in overcoming the AIDS pandemic and other challenges by addressing immediate needs through innovative and strategically targeted

www.onevillagefoundation.org	Mission is to connect art, science and education with proactive, hands on, community oriented actions on the ground that promote more sustainable ways of living in both developing and developed parts of the world. OVF is devoted to increasing collaboration and access to ICT in under-served communities, facilitating local content creation and dissemination, and building bridges among digital and physical communities globally.	China, Japan , Hong Kong, Macau, and SE Asia), SolaRoof LTD (USA), Zero Emissions Research Initiative, University of Education Winneba (Ghana), Institute of African Art and Culture (Oakland and Nigeria), Kenya AIDS Intervention Prevention Project Group, Obafemi Awolowo University (OAU), Fantsuam Foundation, Development Partnership International, African Youth ICT4D Network.	capacity building projects. Goal is to integrate programs into a comprehensive approach to sustainable development focusing on the development of the village level (rural) economy. This approach will focus on: (a) Raising money to develop a core infrastructure through the promotion of social enterprises; (b) Deploy relevant appropriate technologies to underserved communities through Unity Centers; (c) promote services to communities through whole systems approach.
RAND Corporation (Santa Monica, US) www.rand.org	The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis. RAND Corporation provides objective analysis and effective solutions that address the challenges facing the nation and the world. These challenges include such critical social and economic issues as education, poverty, crime, and the environment, as well as a range of national security issues. Through our dedication to high-quality and objective research and analysis and with sophisticated analytical tools developed over many years, RAND engages clients to create knowledge, insight, information, options, and solutions that will be both effective and enduring.	Organization and Divisions of the RAND Corporation: Office of the President (9); Office of the Chief Financial Officer (8); Office of External Affairs (13); Staff Development and Management Office (17); Office of Services (6); Research Divisions at RAND () - RAND Army Research Division, RAND Education, Rand Europe, Rand Health, RAND Infrastructure, Safety and Environment, RAND Institute for Civil Justice, RAND Labor and Population, RAND National Security Research Division, RAND Project AIR FORCE; Other Corporate – RAND Child Policy, RAND Gulf States Policy Institute, RAND-Qatar Policy Institute, RAND Survey Research Group; RAND Advisory Boards; RAND Board of Trustees.	RAND research on science and technology serves a mix of clients, including federal agencies, state, and other government entities, businesses, and foundations. Much research is conducted within the Transportation, Space, and Technology program of RAND Infrastructure, Safety, and Environment. Current clients: U.S. Government, Foreign Governments, Agencies, and Ministries, International Organizations, State and Local Governments, Colleges and Universities, Foundations, Industry, Professional Associations, and Other Non-profit Organizations.

ELSEWHERE:

Grameen Technology Center (Originally from Bangladesh)	Empower the world's poorest people to lift themselves out of poverty with dignity through access to financial services and to information.	GFUSA is a global non-profit organization that combines microfinance, new technologies, and innovation to empower the world's poorest people to escape poverty. Founded in 1997, its global network includes	Major programs: GFUSA Program; India Initiative; Grameen - Abdul Latif Jameel Initiative; China Initiative; Capital Markets; Philippines Initiative; Tsunami Initiative; Social Performance.

www.gfusa.org/technology_center	The Grameen Foundation in USA (GFUSA) is dedicated to delivering measurable results, providing high quality service to its partners, pursuing and supporting innovation in the micro finance industry, promoting the effective use of technology as a poverty reduction strategy.	52 partners in 22 countries. The network has impacted an estimated 11 million lives in Asia, Africa, the Americas, and the Middle East. The Center is managed by a board of 20 directors and counts on with 58 volunteers (persons and organizations) worldwide.	<u>Funding</u>: Selected private and corporate donors - Abdul Latif Jameel Company, Ltd.; Craig and Susan McCaw Foundation; Janet McKinley and George Miller; USAID; American Express Foundation; Google, Inc.; Richard and Lois Gunther Family Foundation; Citigroup Foundation; Microsoft.
Committee for Democracy in Information Technology (Rio de Janeiro, Brazil) www.cdi.org.br	The Committee for Democracy in Information Technology (CDI) is a non-governmental, non-profit organization with the mission of fostering the social inclusion of less-privileged social groups by using ICTs as tools to encourage active citizenship. We work in low-income communities and with institutions assisting individuals with special needs including, among others, the physically and mentally disabled, the visually impaired, homeless children, prisoners, and indigenous populations.	The CDI network can be understood as "a complex learning system". CDI has expanded nationally and internationally, with Regional offices in 19 Brazilian states and in other eight countries, in three continents. CDI Headquarters have developed a completely non-profit "social franchise" defining quality standards. It has an important role representing the Network, in which it updates CDI's educational model, validates and shares best practices and continuously fundraises, trains and follows-up periodically Regional offices. CDI Regional offices are self-managed, reporting to CDI Headquarters guidelines. Their mission is to replicate CDI's methodology and educational model when implementing the schools.	CDI opens Information Technology and Citizens Rights Schools in partnership with community-based associations, providing free computer equipment, software and implementing educational strategies for a continuous training of local instructors. Each of the 965 schools is an autonomous unit, self managed and self-sustainable through a symbolic contribution collected from its students. To promote digital inclusion, CDI forms partnerships with national and international philanthropic organizations, companies, government agencies and individual donors.

B. Summary table of Fraunhofer Institutes that can relate to the new Institute

Institute	Mission	Structure	Main Projects and Funding
FIT **Institute for Applied Information Technology** (Sankt Augustin) www.hhi.fraunhofer.de	FIT Investigates human-centered computing in a process context. The usability and usefulness of information and cooperation systems is optimized in their interplay with human work practice, organization and process. FIT works to enhance human abilities through flexible, context-adaptive information and cooperation systems. Systems designed and built in FIT help decision-makers to evaluate options. They assist the handicapped or elderly to participate more fully in their jobs, in their private lives or as tourists. Systems support designers and engineers in real and virtual work environments, provide Internet-based platforms for social and task-related interaction of learning communities and virtual teams.	FIT is organized in 3 departments with 30 researchers each: the Cooperation Systems group develops and evaluates groupware and community systems for virtual teams and organizations; the ICon group focuses on context-aware information and communication systems for learning, analysis, planning and decision-making; the Life Science Informatics group is concerned with complex, predominantly image-based biomedical environments. FIT include 3 labs: the Software Usability Lab supports usability evaluation and user-centered requirements engineering of computer systems and electronic media; the Mixed Reality Lab provides Personal Display systems, optical, ultrasound and inertial tracking systems for cooperative mixed and augmented reality applications; the Surgical Lab includes simulators for image guidance and minimally invasive interventions, optical and electro-magnetic tracking systems, 3D visualization and stereo display.	R&D projects are carried out in cooperation with partners from European industry and public sector institutions. The types of cooperative projects include: Studies and consulting; Requirements analysis and evaluation; Design and development of innovative applications
HHI **Telecommunications Heinrich-Hertz Institute** (Berlin) www.fit.fraunhofer.de	HHI aims to be a partner for Research and Development in Information Technology in the areas of Photonic Networks and Components, Electronic Imaging Technology for Multimedia and Broadband Mobile Communication.	HHI hosts 268 employees and coworkers. Departments are divided into 3 working areas: Photonic Networks and Components; Electronic Imaging Technology for Multimedia; Broadband Mobile Systems. The Photonic Networks and Systems focuses on high capacity, flexible WDM-networks, broadband access networks, system/component Tests and simulations and 40 Gbit/s WDM loop testbeds. The Photonic Components include lasers, detectors and modulators up to 100 Gbit/s, polymer based OICs, 1200-2000 nm lasers for industrial sensing and hígh power applications. Image Processing includes video coding and communication, computer visions & graphics, immersive media, hardware systems. Interactive Media includes human-machine-interaction, stereoscopic Displays, MPEG-7. Broadband Mobile Communication Networks focuses on MiMo-systems, smart antenna-testbeds and CDMA.	MUSE: R&D on low-cost multi-service access and edge network, which enables the ubiquitous delivery of SoB; WAPITI: wafer-bonding and twin vertically aligned optical waveguides to realize optical microcircuits; FUNFOX: miniature photonic crystals for semiconductor optoelectronic devices; MUFINS: cascaded monolithic integrated optical switches on InP for 40 Gb/s; WORLDSCREEN: content for digital/electronic cinema and media archives.
ESK	ESK aims to play a decisive role in simplifying the operation and administration of systems in the	ESK includes several departments: Ambient Communications: communications devices and services that automatically adapt to the	ESK works with R&D depts of innovative corporations that

Institute for Communication Systems (Munich) www.esk.fraunhofer.de	networked world of the future. ESK conducts applied R&D in the following areas: ambient communications, advanced carrier solutions and integrated software engineering and testing.	individual needs of the user and to specific application environments, thus furnishing users with around-the-clock services that are simple to use and easy to manage; Advanced Carrier Solutions: reliable, easy-to-manage and cost-effective NGN components through the integration of Internet access, and video and voice services using both wired and wireless connectivity; Integrated Software Engineering and Testing: design and test methodologies for the reuse of software modules leading to improvements in software quality; Applications and Technical Services: design communications solutions for the modern workplace, including voice communications based on Voice over IP, computer telephony integration and unified messaging; Communications Technologies: R&D on ubiquitous communications solutions for the home and office in addition to designing NGN solutions at the subscriber access and metro network level; Systems Development: embedded software and office communication, and carrier Ethernet; Transmission Technologies: wired and wireless transmission technologies for voice and data, measurement and test center for broadband subscriber access. The demonstration center provides customers, project partners and others a visual forum for learning about the latest research findings. The Software and hardware development laboratory develops and validates hardware prototypes and conducts tests in embedded software applications.	require state-of-the-art communications solutions. ESK is strategically positioned between the fields of academic and contract research, offers research services that are more flexible and applications oriented than most university institutes. The institute's approach is more neutral and scientific than corporate R&D. ESK helps strengthen the German research landscape and fosters the development of the country's pool of talented young scientists. The sources of funds are contract research (40%), public sector (30%) and the Fraunhofer-Gesellschaft's own finances (30%). ESK also acts as a creative supplier of ideas and strategic consultant.
FOKUS **Open Communications Systems Institute** (Berlin) www.fokus.fraunhofer.de	FOKUS provides R&D services for the development of seamless personalizable communication systems at all stages of the innovation process – from the original innovative idea and project-related R&D right through to testing, prototype development and implementation. R&D at FOKUS has been driven by the vision of I-centric Communication, a paradigm which takes the individual user and the user's own personal communication preferences as the springboard for future technology and application development. In addition, FOKUS has been chosen by the European Commission to take charge of coordinating R&D	FOKUS includes units that provide technical services to consolidate industrial expertise in IT and communications technology, ensure rapid compliance of proprietary solutions to standards, develop and implement IP-based communication infrastructures and services, namely in the fields of UMTS/3G beyond and flexible satellite services, machine-to-machine communication and more. FOKUS implements measurement procedures and systematic testing in distributed Internet environments and develops active standards. Requirement-oriented solution development is another key area of FOKUS. With their high flexibility, cost-effectiveness and suitability for a wide range of uses, standards-based solutions come top of the agenda. FOKUS delivers compliance of proprietary systems with standards, integration of heterogeneous systems in a common run-time environment, development of management environments for complex infrastructures, development of new services from scratch,	As an institute of applied research, FOKUS offers comprehensive services across the whole of the value-added chain from the original idea via design and development cycles right through to the market-ready pre-product. FOKUS aims both to support innovation on the enterprise level, and to inject new impulses into the social and political level to advance and promote pervasive innovation in communications and

	activity in the field of Autonomic Communication.	entertainment/TV sector, facility management, media, eGovernment. FOKUS also works on Testing and Development Environments: enterprise-oriented testing and development environments, testing of manufacturer-own products and applications for functionality in a range of wired and wireless networks, for interoperability and conformity with other products and more. Measurements and testing under real-life conditions with complex distributed communication systems. FOKUS also provides Consultancy Services and Training: concept design for research programs, projects and solution development, feasibility studies for the construction/reconstruction of communication infrastructures, services and applications, technology evaluation for in-service operations and trend development, project management and quality assurance for large-scale projects and mission-critical tasks.	information technology. As a proven partner for industry, Fraunhofer FOKUS defines all its R&D activities in line with market and user requirements: 3G beyond – Infrastructures and Services for Mobile Solutions; Smart Environments – Enabling Technologies for Ambient Intelligence; Model Driven Engineering – Model-based Software Development and Testing and e-Government.
IGD **Institute for Computer Graphics** (Darmstadt) www.igd.fraunhofer.de	The Institute for Computer Graphics focuses on the development of product prototypes (hardware and software) and the realization of concepts, models, and solutions for computer graphics and its adaptation to specific application requirements. The work is rounded off by object-oriented basic research projects and the realization of single devices and computer graphics systems with pilot character (e.g. virtual and augmented reality, mobile computing, and security technologies).	200 people work in the IGD in the following fields: Interactive Multimedia Appliances: technologies for the assembly of coherent acting appliance-ensembles; Industrial Applications: IT support for the virtual product development process; Realtime Solutions for Simulation and Visual Analytics: simulation and rendering in realtime, adaptive 3D data transmission and visualization, interactive visualization of large amounts of multidimensional data; Virtual and Augmented Reality: technology competence and innovative in the areas of Scientific Visualization, Virtual Reality and Augmented Reality; Graphic Information Systems: facility management and spatial information systems; e-Learning & Knowledge Management: system design, system architectures and consulting in multimedia learning and training, simulation and validation, information brokering and interactive tele-services; Cognitive Computing & Medical Imaging: Visual Computing, Medical Imaging, and Multimedia Interfaces; Security Technology in Graphics and Communication Systems. R&D projects are directly related to current problems inindustry, trade, traffic, and service. Competencies developed in Computer Graphics and its applications.	IGD projects are financed by industry and public partners. Project include: Studies about the possibilities to use software systems and technologies, development of application scenarios; Consulting: support for the choice and introduction of software systems and training; Development of Concepts for the realization of software modules; Software Development: verification of concepts, product and system implementations; Software Modification: modification of self-developed or commercial software systems to run on different hardware platforms and operating systems.

C. Summary table of potential partners in Portugal with relevant applied research and development activities

Institution	Description and Competencies
INESC-ID www.inesc-id.pt	INESC-ID is a private not for profit association that integrates competences from researchers in electrical engineering and computer science to advance the state of the art in computers, telecommunications and information systems. It supports the first stages of the value generation chain: basic research, applied research and advanced education. In cooperation with other institutions, INESC-ID performs technology transfer, supports the creation of technology based startups and provides technical support. INESC-ID is a non- profit, privately owned, institution dedicated to advanced research and development in the domains of electronics, telecommunications and information technologies. INESC-ID was created in 2000 and was awarded the status of "Laboratório Associado" in December of 2004. INESC-ID is owned by Instituto Superior Técnico and Instituto de Engenharia de Sistemas e Computadores. It integrates more than 60 PhDs and 100 post-graduation students working in five action lines: Information and decision support systems; Communication networks and mobility; Virtual interactive environments; Embedded electronic systems; Computational processing of the Portuguese language. INESC-ID has three major sources of financing: national projects of R&D, funded by FCT; international projects of R&D, funded by the European Community; development projects funded directly by direct contracts with national or international companies.
INESC-PORTO www.inescn.pt	INESC Porto is a private not for profit association that has been appointed as Associated Laboratory in March 2002. The main activities include scientific research and technological development as well as consulting and advanced training. Activities are clustered as follows: Telecommunications and Multimedia, Power Systems, Manufacturing Systems Engineering, Information and Communication Systems and Optoelectronics. INESC Porto is an institution created to act as an interface between the academic world, the industry and services, as well as the public administration, in what concerns Information Technologies, Telecommunications and Electronics (ITT&E). INESC Porto pursues his mission by selecting areas and forms of activity to promote innovation, internationalization and socio-economic impact. By establishing a set of strategic partnerships, it achieves sustainability which guarantees his liability. INESC Porto proposes to: develop S&T to compete evenly in national and international standards; cooperate in the training of human resources of technical and scientific quality, encouraged to believe in the national capacities and in the modernization of the country; contribute to the development of the scientific and technological teaching system, updating and adapting it to the needs of the social and economic environment; facilitate and incubate business initiatives in order to improve its R&D activities and to promote initiative and risk behavior among its young researchers; promote a modern country, a well-established economy and a quality society, by complying with the above–mentioned principles/objectives.
Institute for Systems and Robotics (Lisbon) www.isr.ist.utl.pt	ISR-Lisbon is a university based R&D institution where multidisciplinary advanced research activities are developed in the areas of Robotics and Information Processing, including Systems and Control Theory, Signal Processing, Computer Vision, Optimization, AI and Intelligent Systems, Biomedical Engineering. Applications include Autonomous Ocean Robotics, Search and Rescue, Mobile Communications, Multimedia, Satellite Formation, Robotic Aids. ISR, together with three other partner research institutions, IN+, IMAR-Azores and CREMINER is, since November 2001, an Associate Laboratory. ISR-Lisbon gives special attention to international scientific research cooperation and to training and education initiatives through master, doctoral and post-doctoral programs. Grants are available for foreign students and researchers who wish to enroll in these programs. Ever since its foundation, and in close cooperation with IST, ISR-Lisbon has been committed to meeting the following main strategic objectives: promote scientific research and technological development in Robotics, Information Processing and associated areas; promote active intellectual collaboration among researchers with varied backgrounds and perspectives acquired in different kinds of science (e.g., experimental, computational and theoretical), different sectors (university, industry, governmental and regional administration) and different regions; provide education and research experience for graduate and undergraduate students, post-doctoral researchers, and industrial fellows, providing exposure to leading-edge research and introducing the students to large-scale collaborative research

	ventures; promote the diffusion of scientific results through publications and by organizing seminars, conferences, exchange visiting programs and scientific meetings at a national or international setting; increment the scientific exchange among Portuguese Universities and these and other foreign Universities and similar institutions, through the exchange of researchers and students, and the participation in joint ventures; promote and support integrated graduate programs leading to Master and Doctor degrees; promote the participation in research projects with national or international Universities, R&D institutions and industrial companies. ISR-Lisbon has a research team of 124 researchers, 32 PhDs. They are responsible for the supervision of 65 post-graduate and 27 undergraduate students. ISR-Lisbon is engaged in several international collaborative projects. Two types of cooperation are specially noteworthy: firstly, participation in R&D projects in conjunction with universities and research centers of excellence, as well as European businesses with recognized competence, under the auspices of programs funded by the Portuguese Science and Technology Foundation, European Community and other agencies; and secondly, training and education initiatives, primarily through master, doctoral and post-doctoral programs for Portuguese and foreign researchers.
Institute for Telecommunications www.it.pt	The Institute of Telecommunications (IT) is a private not for profit association which was granted the statute of Associated Laboratory in November 2001. IT mission is to create and disseminate scientific knowledge in the field of telecommunications. IT is actively involved in fundamental and applied research in telecommunications both at national and international level. Simultaneously it is committed to foster higher education and training, by hosting and tutoring graduate and postgraduate students. IT is a private, not-for-profit organization, resulting from a partnership of five institutions with experience and traditions in research and development in the field of Telecommunications: Instituto Superior Técnico (IST); Universidade de Aveiro (UA); Faculdade de Ciências e Tecnologia da Universidade de Coimbra (FCTUC); Portugal Telecom Inovação, S.A. (PTIn) and Siemens, S.A. IT is organised around three sites: one in Aveiro, in the University Campus, another in Coimbra, in Branch II of the University of Coimbra and the third one in Lisbon at IST, along with an external Laboratory in Covilhã in the University of Beira Interior and a delegation in Leiria in the Polytechnic Institute of Leiria. IT is managed by a Board of Directors, and by site management boards. IT scientific activities are overseen by the Scientific Board. Scientific expertise in IT, from which follow its main research and education activities, spans through Wireless Communications, Optical Communications and Networks and Multimedia, to which adds the horizontal area of Basic Sciences and Enabling Technologies. IT members are organized into research groups, with specific scientific backgrounds and different number of members, covering the whole range of it areas of R&D.
ALGORITMI Center www.algoritmi.uminho.pt	The R&D Centre ALGORITMI is a research unit of the University of Minho that develops its activities in the fields of Information, Production and Electronics Technologies. The researchers of this unit are presently close to 140 members, 41 of them with PhD. The unit focuses its activity on projects that explores a strong link with the community, namely the industries. The number of co-operation projects that involves both the Centre and industries or other external institutions expresses this strategy; these types of projects have been increasing in previous years and commonly include industries that have a local relevant importance. The University of Minho is located in a highly industrialised region with an important expression on textile and footwear industries. The automotive industrial field gained recently an important share of the market. Another external factor that influences our target field of application is the growth of the cities in the region, which introduces several demands for the co-operation of researchers, namely in the filed of logistics, communication and resources management. In particular, the Centre ALGORITMI preferably supports projects that allow an effective technology transfer that ensures an added-value increase of the national industries. In regard with this trend, most of the co-operative projects have the goal of producing new equipment, with national know-how, and important for the local industries. To promote the combination of different teams' efforts in this type of projects, we engage 50% of the R&D funding to support inter-disciplinary activities, preferably in projects focused on the development of new systems, tools or services. Nevertheless, to guarantee a correct use and understanding of new technologies on the main fields of the Centre knowledge, we must be sure that researchers keep up to date. This is ensured by the support of basic research activities, using the remaining 50% of R&D funding to maintain long-term projects.

	The main projects carried out are focused on some specific fields, namely: Sensors, Microelectronics and Microsystems and Image Processing; Power Electronics, Process Control and Electric Power Conditioning; Telecommunications, Computer Networks, distributed Systems and Multimedia; Hardware/Software Co-design, Software Engineering and Soft Computing; Geo-referenced Data Base and Data Mining; Operational Research and Optimisation.
Rehabilitation Engineering Center	The Center for Rehabilitation Engineering aims at applying science and technology to improve the quality of life of the citizens with special needs, namely people with impairments, and the elderly, by providing, through ICTs, access to education, health care and to the workplace. Main activities include promoting e-accessibility to ICTs (through computers, new software, the Internet, telecommunication systems and TV), researching, evaluating and diffusing technical aids; supporting special educational needs in schools in Vila Real; developing projects for tele-rehabilitation; and contributing to the national program to support citizens with special needs.
Hurray Center www.cister.isep.ipp.pt	HURRAY stands for HUgging Real-time and Reliable Architectures for computing sYstems, which means that the group focuses its activity in the analysis, design and implementation of real-time and dependable computing systems. Real-time computing systems are those systems in which correctness of the system depends not only on the logical result of computation, but also on the time at which the results are produced. This implies that, unlike more traditional information systems where there is a separation between correctness and performance, in real-time computing systems correctness and performance are very tightly interrelated. Real-time and dependable computing systems (CaberNet) are used in many application areas. Historically, factory automation was one of the first fields for the application of real-time and dependable computing systems. The decentralisation and distribution of computational activities and the massive use of processors and communications bring important challenges for guaranteeing the real-time and dependability requirements of the applications. The IPP-HURRAY! research group has been working (Sister, Remeter) in real-time communication networks for factory-floor applications (WFCS'2000). Also in the area of real-time communications we started to work (Cider) on Ethernet technologies. We firmly believe that the recent technological advances in Ethernet technologies will enable its use in real-time dependable applications. In Cider, Ethernet will also be exploited to build adaptable real-time and dependable computing systems able to cope with applications which are more and more evolutionary in their nature. In fact, flexibility, adaptability and reconfigurability are currently hot topics in real-time dependable computing systems. These topics are also being addressed in another project (R-Fieldbus). Finally it is important to mention Dear-COTS, which proposes a new architecture targeting real-time and reliable distributed computer-controlled systems (DCCS). This architecture provides a structured approach for the integration of soft and/or hard real-time applications with commercial off-the-shelf (COTS) components. The reliability and availability requirements of hard real-time applications are guaranteed by a software-based (Ada 95) fault-tolerance approach on top COTS real-time operating systems.
Knowledge Engineering and Decision Support Group www.gecad.isep.ipp.pt	The Knowledge Engineering and Decision Support Group is a R&D unit operating in the areas of Artificial Intelligence, Knowledge Based Systems, and Decision Support Systems. At the end of 1993 researchers of ISEP/IPP (Institute of Engineering – Polytechnic of Porto) established their research activities in this institute. This R&D group was involved in the Computer Integrated Manufacturing Centre of ISEP and in the Research Centre for Applied Engineering – CIEA, the first recognized R&D unit in the Polytechnic Schools in Portugal, creating a group of Computer Integrated Manufacturing and Artificial Intelligence in CIEA. This group was responsible for the first projects in the Portuguese Polytechnic Schools supported by R&D supporting foundations.
Institute of Electronics and Telematics Engineering of Aveiro	The Institute of Electronics and Telematics Engineering of Aveiro (IEETA) was established in 1999. It is a private non-profit-making scientific association made up of the University of Aveiro, the Fundação João Jacinto de Magalhães and the GrupUnave. INESC - Pólo da Universidade de Aveiro was also integrated into IEETA. The mission of the Institute is to carry on multidisciplinary research and promote advanced development in Electronics and Telematics, both integrated in the international research community and contributing to national technological and social

www.ieeta.pt	development. Healthcare is one of the areas of intervention.
Institute for Systems and Robotics (Coimbra) www.isr.uc.pt	The Institute of Systems and Robotics - University of Coimbra is a Portuguese private, non-profit Institution dedicated to research in the field of robotics. ISR was created in 1992 with the global purpose of setting up a first class multisciplinnary research team, able to carry out leading edge research in several key areas of science and technology, with a special emphasis in automation and robotics. ISR-Coimbra has three groups featuring strong synergies between them: Automation and Robotics which is the core group, Control Theory and Operations Management. The Automation and Robotics Group, has activities in the areas of robotics vision, autonomous systems, multi-sensor fusion and integration, tele-operation, sensor development, soft-control and motors and drives. The scientific objectives of the Control Theory Group can be described as follows: to develop fundamental research in the area of systems and control; to communicate the results through scientific publications and participation in major conferences; to establish an appropriate environment for creating interactions with scientists from engineering and other sciences and conduct interdisciplinary research; to develop special programs in control theory, enabling students from mathematics and engineering to obtain interdisciplinary training for working in control and its applications and to increase national and international collaboration with leading institutes and prominent researchers. The activities of the OM Group - Operations Management Group include (i) the Development of I&D projects in cooperation with industrial companies, that includes projects involving the simulation of production processes and the productive resources optimization, (ii) studies to improve organizational structures and the analysis of new management methodologies, (iii) and the identification of strategies to obtain the empowerment of human resources and organizational efficiency. The OM Group members have been developing research projects with several American and European partners, and this policy will be pursued in the future.
Artificial Intelligence and Computer Science Laboratory www.liacc.up.pt	The Laboratory of Artificial Intelligence and Computer Science (LIACC) was originally proposed by professors from the Faculties of Science, Economics, and Engineering, and was approved by the Scientific Council of the University of Porto in September 1988. One of the main goals associated with this initiative was to promote the close collaboration of researchers of this University that were separately working in the fields of Computer Science and Artificial Intelligence. The areas under research by the Computer Science Group are the following: Computer Networks whose work has been focused on the proposals of scalable network architecture solutions with Quality of Service (QoS) support; on seamless QoS and security in heterogenous networks; on security and optimization of routing repair in ad-hoc networks, and on integration of ad-hoc and infra-structure networks, in terms of routing and QoS aspects; Declarative Programming that can be seen as a means for achieving robust programming, offering at the same time ample opportunities for exploring implicit parallelism; Parallel and Distributed Systems, research in this area is relevant for the development of adequate programming paradigms for new technologies in networking, wireless computing and portable devices. Work has concentrated in developing a process-calculi based language with support for code mobility and distribution and a peer-to-peer system for high-performance distributed computing; Optimization, Constraints and Heuristics, appears as a necessary complement to other lines of research due to their needs in what concerns optimization and problem-solving in general; Logic, Language and Computation, is a strategic area in the sense that it can provide the basic results for the work on the other, more applied areas. Work is being done in the study of type systems for the lambda-calculus and their application on programming languages, algorithmic complexity and cryptography, and also of computability and formal languages; Innovative Applications, is mainly a pool of projects for developing applications that demonstrate the usefulness of recent paradigms, languages and tools, as well as the NCC proficiency in the field. It also serves as a means for identifying interesting theoretical problems, providing test-beds for new concepts in software development, and increasing the interaction with the non-academic community; The Artificial Intelligence and Data Analysis Group (NIAAD) is one of the groups of LIACC which is one of the R&D Units of the University of Porto. The NIAAD group is associated with the Faculty of Economics and includes the Machine Learning subgroup.

Large-Scale Informatics Systems Laboratory http://lasige.di.fc.ul.pt	LASIGE - Large-Scale Informatics Systems Laboratory is a research unit of the Informatic Department (DI) of the University of Lisboa, Faculty of Sciences (FCUL). The mission of the laboratory is to promote research, training, and technology transfer in areas such as: computer networks, distributed algorithms, security, real-time, databases, multimedia information retrieval; digital publishing, electronic commerce, and bioinformatics. LASIGE research activities are funded by FCUL, by FCT (through the "plurianual" programme and national research projects), and by international projects (mainly, E.U. projects). LASIGE has approximately 67 collaborators, 19 of which hold a doctoral degree, 12 are researchers in the middle of their Ph.D. programmes and 25 are MS.C students or junior researchers.
Research Center for Informatics and Information Technologies www.citi.di.fct.unl.pt	The research directions pursued by the CITI center encompass a broad spectrum of issues, from the foundations, models and paradigms, the programming languages and software architectures, the parallel and distributed computing systems, and the multimedia, graphics, interaction, and the human language technologies. About 40 Phds currently work in the above areas, graduated in different places in Portugal and in other countries. Such a broad coverage is a distinctive aspect of our center, and we believe it provides us with unique capabilities to explore the challenging issues posed by emerging and new paradigms in computing, that are influencing the design of new abstractions, software concepts, tools and environments, and system architectures. Visions of the infomation and computing systems for the next decade, require us to have a global perspective to understand universes of heterogenous components, resources, and devices (both abstract and physical) which dynamically evolve both in space and time, and establish complex direct or indirect interactions. These systems must be modelled and engineered so that they can meet the requirements of challenging applications, for complex-problem solving and provision of information services in all areas of the Human Society. In CITI, we are now pushing forward increased national and international levels of collaboration involving researchers from Computer Science and also researchers from other scientific areas. This is related to our initiatives for increasing international collaborations, and attracting young researchers (M.Sc. and Ph.D. students, to join the graduation programmes offered by our Department of Informatics), and post-doctorates to work with us.

D. Summary table of projects developed at UMIC - Knowledge Society Agency in the field of e-accessibility and e-inclusion

Project	Description
Public Internet Spaces	More than 1,000 Internet Spaces provide free access to multimedia computers and to the Internet to citizens all over the country. In all the Internet Spaces, trained personnel assure permanent support to users and act as social mediators to technology in local, and frequently remote, communities. Most of them have working stations specially equipped for accessibility to the handicapped.
National Program for citizens with special needs	UMIC developed, in collaboration with the University of Trás-os-Montes e Alto Douro, legislation for the integration of citizens with special needs in the Information Society: www.acesso.umic.pt/legis/pnpcnesi.htm, turned into law on 12-08-2003
Protocol with RTP/SIC/TVI	UMIC has established a protocol with SIC and TVI under which both TV providers must broadcast a minimum of 5h/week of content with subtitles (over teletext) and with gesture language. RTP commits to do the same for a period of 10 hours.
Radio for the deaf	Project that promotes broadcasting radio through gesture language. The first session took place on April, 7th 2005. It proved that it is possible and effective to transmit radio with gesture language. This program called upon the pressing need to transmit, in this way, news feeds from radio broadcast. Synchronization between audio and iamge frames can be obtained through the Internet.
Training for e-accessibility	UMIC has organized series of seminars and training sessions on the issue of e-accessibility. In 2003, sessions included training for higher education institutions, who at the time were launching new content and services online, and for professionals of the public administration. In 2005, sessions included training for the local government and for the national association of museums.
Helpdesk and web consultancy	UMIC maintains an online forum at acesso-webmasters@egroups.com with more than 100 participants from the university and the public administration that exchange information and recent updates on the e-accessibility guidelines and exchange experiences and knowledge about how best implement e-accessibility on the Internet.
Access kit for digital inclusion	UMIC produces an access kit that compiles information, software and versions of applications that facilitate access to computers and to the Internet by citizens with special needs. Different versions of this kit are tailored to web professionals and education agents.
Guidelines for e-accessibility on the web	UMIC keeps copy, in Portuguese, of the e-accessibility guidelines periodically updated by the W3C. They are accessible on the Internet at www.acesso.umic.pt/wai/wai.htm. UMIC performs regular evaluations of e-accessibility of various websites and provides rankings for higher education institutions and the public administration.
Management of funding program for digital inclusion	UMIC manages the national program for digital inclusion of citizens with special needs, funded by the Operational Program for the Information Society. This program promotes the development of products and services for these citizens, who have also engaged in the definition of the requisites that these products must satisfy. Currently, 18 projects are underway.
Internet Spaces with access to citizens with special needs	UMIC has also been active in promoting the deployment of Internet Spaces with full access to citizens with special needs. These spaces must have at least 3 computers with technology to support interaction with citizens with special needs and access ramps.
Management of the network for institutions for solidarity	UMIC manages the broadband network that connects and provides Internet access to all institutions for solidarity in Portugal (500+) and helps promote their presence online. Recently, the network has reached impaired students residing at hospitals.

E. Summary table of examples of successful firms that produce digital content and services

Company	Selected Links:	Description
Yahoo!	www.yahoo.com; http://mail.yahoo.com; http://blo.gs; http://del.icio.us; http://geocities.yahoo.com; http://music.yahoo.com	Yahoo! Inc. is an american computer services company. It operates an Internet portal, the Yahoo! Directory and a host of other services including Yahoo! Mail. It was founded by Stanford graduate students David Filo and Jerry Yang in January of 1994 and incorporated on March 2, 1995. Yahoo! had its initial public offering on April 12, 1996, raising $33.8 million, by selling 2.6 million shares at US$13 each. The company is headquartered in Sunnyvale, California. Yahoo! has partnerships with telecommunications and Internet providers such as BT in the UK, Rogers in Canada, and AT&T, Verizon and BellSouth in the US, to create content-rich broadband services to rival those offered by AOL. The company offers a branded credit card, Yahoo! Visa, through a partnership with First USA. In June 2005 Yahoo! acquired blo.gs, a service based on RSS feed aggregation, primarily from weblogs, which produces a simple list of freshly updated Weblogs, ordered according to recentness of update. blo.gs was the first Internet company hosted on a domain hack acquired by Yahoo!, del.icio.us being the second.
MSN	www.msn.com; www.hotmail.com; http://messenger.msn.com; http://zone.msn.com; http://shopping.msn.com; http://chat.msn.com; http://groups.msn.com; http://adcenter.msn.com; http://video.msn.com; http://mappoint.msn.com; http://desktop.msn.com	MSN is a collection of Internet services provided by Microsoft and released on August 24, 1995. Other services were added over time such as Hotmail and instant messenger. Recently, MSN has launched many new services such as MSN Virtual Earth, Desktop Search, and a customizable search engine. MSN was largely rebranded recently to Windows Live with the release of Windows Live Mail and Windows Live Messenger in 2006. MSN service aims at the personal and family user, whilst Windows Live will be a dedicated search facility for various media. In the US, MSN is also an Internet Service Provider. In other countries, MSN uses underwriters for their services. With 9 million subscribers, MSN is the second largest Internet Service Provider in the United States behind America Online with 26.5 million. To use MSN services, users must have a Microsoft Passport Network account, an account system which allows access to all of the Microsoft Network facilities.
Google	www.google.com; http://desktop.google.com; http://earth.google.com; http://maps.google.com; http://video.google.com; www.google.com/adsense/; www.blogger.com; www.writely.com;	Google began as a research project in January, 1996 by two Ph.D. students at Stanford who hypothesized that a search engine that analyzed the relationships between websites would produce better results than existing techniques (how many times the search term appeared on a page).The search engine used the Stanford University website with the domain google.stanford.edu. google.com was registered on September 15, 1997, and the company was incorporated as Google Inc. on September 7, 1998 at a friend's garage in Menlo Park, California. The Google search engine attracted a growing number of users due to its simple, uncluttered design. In 2000 Google began selling advertisements associated with the search keyword to produce enhanced results, this was important for increasing advertising revenue based upon the number of hits. Keywords were sold based on a combination of price bid and "clickthroughs". U.S. Patent 6,285,999 describing Google's ranking mechanism (PageRank) was granted on September 4, 2001. Recently Google announced partnerships with NASA, for large-scale data management, massively distributed computing, covergence of bio-info-nano and encouragement of the entrepreneurial space industry; with Time Warner's AOL, for

	http://mail.gmail.com; http://froogle.google.com; http://checkout.google.com; www.orkut.com	video search and with Sun Microsystems to help in OpenOffice.org. Google also purchased the radio advertising company dMarc for automated advertise on the radio. The company has also created other engines, such as Google Earth and Froogle.
AOL Time Warner	www.cnn.com; www.hbo.com; www.tbs.com; www.tnt.tv; www.cartoonnetwork.com; www.aol.com; www.icq.com; www.mapquest.com; www.weblogs.com; www.engadget.com; www.time.com; www.people.com; www.warnerbros.com	Time Warner Inc. is a large media company with major Internet, publishing, film, telecommunications and television divisions. The company is headquartered in New York City, United States. The following enterprises are part of Time Warner: Cable News Network (CNN), Home Box Office (HBO), TBS Super-station, Turner Network Television (TNT), Cartoon Network, The WB Television Network, Time Warner Cable, TIME Magazine, MAD magazine, Fortune, Warner Brothers, New Line Cinema movie studio, Castle Rock Entertainment, Atlanta Braves, DC Comics, Turner Entertainment, Turner Broadcasting System, SportsNet New York, and AOL. Via its Web Properties Group it includes Advertising.com, CompuServe, Mirabilis, MapQuest, Netscape, Nullsoft, Singingfish, Weblogs, Inc). Time Warner also owns several other television channels and magazines such as CNN Headline News.
News Corporation	www.harpercollins.com; www.thesun.co.uk; www.newsoftheworld.co.uk; www.sunday-times.co.uk; www.timesonline.co.uk; www.tvguide.com; www.weeklystandard.com; www.wired.com; www.foxmovies.com; www.foxstudios.com; www.fox.com; www.sky.com; www.directv.com; www.foxnews.com; www.thefoxmoviechannel.com; www.nationalgeographic.com; www.myspace.com	News Corporation is a media conglomerates managed by Rupert Murdoch, who created the Fox Broadcasting in 1986. News Corporation is a public company formerly incorporated in Adelaide, Australia, and re-incorporated in the United States on 12 November 2004. Revenue for the year ended 30 June 2005 was $23.859 billion. News Corporation was created in 1980 as a holding company for News Limited. In 1986 and 1987, News Corp moved to adjust the production process of its British newspapers, over which the printing unions had long maintained a highly restrictive grip. Its first acquisition in the United States date from 1973 and include the San Antonio Express-News, The Sunday Mail, The Daily Telegraph, The Sunday Telegraph, The Herald Sun, The Sunday Herald Sun, The Sunday Mail, The Sunday Times, (UK) The Sun, The Sunday Times, The Times, (US) The New York Post, Wired, 50% of National Rugby League (Australia and New Zealand), 40% of Staples Center, 9.8% of the Los Angeles Lakers, Studios - 20th Century Fox, Fox Television Studios, TV - Fox Broadcasting Company, Satellite television - BSkyB, DirecTV, DirectTV Latin America, Cable - Fox College Sports, Fox News Channel, Fox Sports Net, Fox Sports en Latinoamérica, Australia's largest satellite and cable pay TV provider, National Geographic Channel and, more recently MySpace.

eBay	www.ebay.com; www.paypal.com; www.skype.com	eBay Inc., founded in San Jose on September 4, 1995 by computer programmer Pierre Omidyar as Auctionweb, manages an online auction and shopping website. Jeff Skoll was hired as the company's first president and full-time employee in 1996. The company officially changed its name to eBay in September 1997. Originally, the site belonged to Echo Bay Technology Group, Omidyar's consulting firm. Millions of collectibles, appliances, computers, furniture, equipment, vehicles, and other miscellaneous items are listed, bought, and sold daily. Services and intangibles can be sold too. Software developers can create applications that integrate with eBay with the eBay API by joining the eBay Developers Program. In July, 2002, eBay acquired PayPal, for $1.5 billion in stock. On August 13, 2004, eBay took a 25% stake in Craigslist. In September 2005, eBay bought Skype, for $2.6 billion in stock and cash.
Amazon	www.amazon.com; www.alexa.com; www.a9.com; www.imdb.com	Amazon.com is an American electronic commerce company based in Seattle, Washington. Made its first annual profit in 2003. Amazon also owns Alexa Internet, A9.com, and the Internet Movie Database (IMDb). Founded as Cadabra.com by Jeff Bezos in 1994 and launched in 1995, Amazon.com began as an online bookstore, though it soon diversified its product lines, adding DVDs, music CDs, computer software, video games, electronics, mp3 players, apparel, furniture, food, and more. Amazon has established separate websites in Canada, the United Kingdom, Germany, Austria, France, China and Japan and it ships globally on selected products. Amazon offers web services for access to its catalog as well as for integration with retailers like Target and Marks & Spencer. A9.com provides search engine services directly on the Amazon.com site. The company was incorporated in 1994 in the state of Washington, began service in July 1995, and was reincorporated in 1996 in Delaware. Amazon.com had its initial public offering on May 15, 1997 at an IPO price of $18.00 per share. Amazon.com launched Amazon.com Auctions, its own Web auctions service, in March 1999. However it failed to chip away at industry pioneer eBay's juggernaut growth.
Real Network	www.real.com; www.rhapsody.com	RealNetworks is a provider of Internet media software and services based in Seattle. The company is best known for the creation of RealAudio, a compressed audio format, RealVideo, a compressed video format, RealPlayer and for its leadership in the field of streaming media. Helix is their open source media framework. In August 2003, RealNetworks acquired Listen.com's Rhapsody music service which offers streaming music downloads for a monthly fee. In January 2004, RealNetworks created the RealPlayer Music Store, featuring DRM-protected music in the AAC file format. They also created Harmony, which allows their music to play on iPods as well as on Microsoft Windows Media Audio.
Viacom Online	www.paramount.com; www.dreamworks.com; www.mtv.com; www.sega.com; www.nick.com; www.comedycentral.com; www.vh1.com; www.bet.com; www.cmt.com; www.spiketv.com	Viacom is an American-based media conglomerate with various worldwide interests in cable and satellite television networks (MTV Networks and BET), video gaming (part of Sega of America), and movie production and distribution (the Paramount Pictures movie studio and DreamWorks). Former Viacom was renamed CBS Corporation, from which this firm was split off in 2006. It is comprised of MTV Networks, BET Networks, Paramount's movie studio, and Paramount Pictures' home entertainment operations. These businesses are categorized as the high-growth businesses. Sumner Redstone still controls 71% of the voting stock of both companies and is the chairman of both companies. Recently, Viacom purchased Neopets, Paramount acquired DreamWorks and Viacom has obtained Xfire.

Craigslist	http://sfbay.craigslist.org; http://portugal.craigslist.org; http://rio.craigslist.org	Craigslist is a centralized network of online urban communities, featuring free classified advertisements (with jobs, housing, personals, for sale/barter/wanted, services, community, gigs and resumes categories) and forums sorted by various topics. It was founded in 1995 by Craig Newmark for the San Francisco Bay Area. After incorporation in 1999, Craigslist expanded into nine more cities in 2000 (all of them in the U.S.), four each in 2001 and 2002, and 14 in 2003. As of June, 2006, Craigslist had established itself in approximately 310 cities all over the world. As of 2006, Craigslist operates with a staff of 21 people. Its sole source of revenue is paid job ads in select cities and paid broker apartment listings in New York City. It serves over 4 billion page views per month by 10 million unique visitors. With over 10 million new classified ads each month, Craigslist is the leading classifieds service in any medium.
New York Times	www.nyt.com; www.about.com	The New York Times is a newspaper published in New York City by Arthur Ochs Sulzberger Jr. and distributed internationally. It is owned by The New York Times Company, which publishes 47 other newspapers, including the International Herald Tribune and the Boston Globe.. The Times has had a strong presence on the web since 1995, and has been ranked one of the top web sites. It has a general policy of keeping articles freely available for a week and charges subscription for older articles. For the month of March 2006, NYTimes.com had a strong traffic, with 11.6 million unique visitors and continues to rank as the number one newspaper site. In September 2005, the paper decided to begin subscription based service for daily columns in a program known as TimesSelect. Times Select is free for print copy subscribers, online readers can access it for $7.95 per month. As of January 2006 online reproduction of Select content is extremely difficult to find on commercial websites.
Wikipedia	www.wikipedia.com	Wikipedia is an international Web-based free-content encyclopedia project. It exists as a wiki, a website that allows visitors to edit its content. Wikipedia is written collaboratively by volunteers, allowing most articles to be changed by anyone with access to the website. Wikipedia's main servers are in Tampa, Florida, with additional servers in Amsterdam and Seoul. The project began in January 2001and is now operated by the non-profit Wikimedia Foundation. As of August 2006, Wikipedia has more than 4,600,000 articles in many languages, including more than 1,300,000 in the English-language version. There are more than 200 language editions of Wikipedia, fifteen of which have more than 50,000 articles each. Wikipedia is ranked among the top 20 most visited websites, and many of its pages have been mirrored or forked by other sites. However, there has been controversy over Wikipedia's reliability and accuracy, with the site receiving criticism for its susceptibility to vandalism, uneven quality and inconsistency, systemic bias, and preference for consensus or popularity over credentials.
Comcast	www.comcast.com; www.mgm.com; www.unitedartists.com; www.olntv.com; www.comcastnetwork.tv; www.thegolfchannel.com	Comcast Corporation, based in Philadelphia, Pennsylvania, is the largest cable company and the largest broadband (second overall) Internet service provider in the United States. It develops broadband cable networks and is involved in electronic retailing and television programming content. The company employs over 80,000 people. It was founded in 1963 by Ralph J. Roberts, Daniel Aaron, and Julian A. Brodsky in Tupelo, Mississippi. The company was incorporated in Pennsylvania in 1969, under the name Comcast Corporation from American Cable Systems. Comcast became majority owner of Comcast-Spectacor, Comcast SportsNet, E! Entertainment Television, Style Network, G4, The Golf Channel and OLN. In 2006, Comcast started a new sports channel in cooperation with Major League Baseball's New York Mets in the greater New York City region. It also carries some NHL & NBA Games. After the sale of their cellular division to SBC of San Antonio and the acquisition of Greater Philadelphia Cablevision in 1999, Comcast and MediaOne announced a $60 billion merger which did not occur until three years later.

Disney	www.disney.com; www.go.com; www.espn.com; www.abcnews.com; www.movies.com; www.miramax.com; www.pixar.com; www.abc.com	The Walt Disney Company is one of the largest media and entertainment corporations in the world. Founded on October 16, 1923 by brothers Walt and Roy Disney as a small animation studio, today it is one of the largest Hollywood studios and owns nine theme parks and several television networks, including the American Broadcasting Company (ABC). Disney's corporate headquarters and primary production facilities are located at the Walt Disney Studios in Burbank, California, USA. It had revenues of $31.9 billion in 2005. Disney also operates Walt Disney Internet Group (WDIG) through Media Networks. WDIG includes the Go.com web portal, based on the old Infoseek search engine which it purchased in 1998, and leading websites such as Disney.com, ESPN.com, ABCNews.com and Movies.com.
BBC	www.bbc.co.uk	The British Broadcasting Corporation, founded in 1922, is the largest broadcasting corporation in the world. It produces programs and information services, broadcasting on television, radio, and the Internet. BBC's mission is "to inform, educate and entertain". The BBC is a quasi-autonomous Public Corporation operating as a public service broadcaster. The Corporation is currently run by a board of governors appointed by The Queen on the advice of government ministers; however, the BBC is, per its charter, to be free from both political and commercial influence and answers only to its viewers and listeners. Its domestic programming and broadcasts are primarily funded by levying television license fees, although there is also money raised through commercial activities such as sale of merchandise. To keep the license, BBC is expected to produce a number of high-rating shows.

F. Summary table of examples of successful firms providing tools for social construction and social networking

Site	Reference	Description
Myspace.com	www.myspace.com	MySpace is a social networking website based in West Hollywood, California offering an interactive, user-submitted network of blogs, profiles, groups, photos, MP3s, videos and an internal e-mail system. As of August 2006, it is the world's fourth most popular English-language website and the seventh most popular in any language. In the US it accounts for 4.5% of all website visits. MySpace has achieves 80% of visits to online social networking websites. It has become an increasingly influential part of contemporary pop culture, especially in the Anglosphere. MySpace has 300 employees, is owned by Newscorp and currently reports just over 100 million members. The website also attracts 500,000 new members each week. MySpace is also home to various independent musicians and independent filmmakers who upload songs and short films directly on their profile.
Classmates.com	www.classmates.com	Classmates.com is a social networking website created in 1995 by Randy Conrads who founded Classmates Online, Inc. The website helps members find, connect and keep-in-touch with friends and acquaintances from throughout their lives – including kindergarten, primary school, high school, college, work and the United States military. Classmates.com has more than 40 million active members in the United States and Canada. It is free for people to register as a Basic member. Members may also post photographs, announcements, biographies, read community message boards and be informed of upcoming reunions. Gold members, who pay an annual fee, can also initiate sending email to any member, use website tools for planning reunions and events.
Facebook.com	www.facebook.com	Facebook is a social networking service for high school, college, university, corporate, non-profit, military and geographic communities primarily in English-speaking countries. As of December 2005, it has the largest number of registered users among college-focused sites (at over 7.5 million US college student accounts created with an additional 20,000 new accounts being created daily). It is the number one site for photos with 1.5 million photos uploaded daily, and is the seventh most trafficked site in the United States Anyone with access to a valid E-mail address from 2,000+ universities can register for and access the site. This includes university students, alumni, faculty, and staff, although the vast majority of Facebook's users are students. Facebook is also available at 25,000+ American and Canadian high schools as well 1,000+ corporations and non-profit organizations, such as JPMorgan Chase, Microsoft, Pepsi and Teach for America. The site is free to users and generates revenue from advertising including banner ads and sponsored groups. Users create personal profiles, typically containing photos and lists of interests, exchange private or public messages, and join groups of friends. The viewing of detailed profile data is restricted to users from the same network or confirmed friends. Facebook is based in Palo Alto.
YouTube	www.youtube.com	YouTube is a social website that allows users to upload, view, and share video clips. It was founded in February 2005 by three early employees of PayPal. YouTube has fifty employees and is located in San Mateo, California, USA. YouTube uses Adobe Flash to serve its content, which includes clips from films and television programs, music videos, and homemade videos. Video feeds of YouTube videos can also be easily embedded on blogs and other websites. YouTube prohibits the posting of copyrighted video by anyone but the copyright holder; however, restriction of copyrighted material has proven very difficult. In November, 2005, venture capital firm, Sequoia, invested $3.5 million in YouTube. In April, 2006, Sequoia Capital invested a further US$8 million in YouTube. The site's popularity surged in December 2005 when it hosted the popular Lazy Sunday clip from a Saturday Night Live broadcast. On March 14, 2006, YouTube set a 10-minute limit on videos, except for those uploaded through its Director Program.Under the terms of a partnership, NBC will create an official NBC Channel on YouTube to showcase its preview clips.

MSN Spaces	http://spaces.live.com	MSN Spaces was Microsoft's free Social Networking platform. The site was launched in early December 2004 with the aim of allowing users to reach out to others by publishing their thoughts, photos and interests in an easy and compelling way. MSN Spaces users were given over 100 varied themes and several different page layouts to choose from when designing their MSN Space. Users also had the option to set access rights for visitors to their MSN Space based on the relationship between them. MSN Spaces was integrated with MSN Messenger and all versions of Windows Live Messenger. This integration allowed MSN Messenger users to easily view their contacts' MSN Spaces and also alert users (via "Gleams") of updates. In August 2006, MSN Spaces became part of the Windows Live services platform, where it is now rebranded as Windows Live Spaces.
Xanga.com	www.xanga.com	Xanga is a website that hosts weblogs, photoblogs, and social networking profiles. It is operated by Xanga.com, Inc., based in New York City, USA. Xanga's origins can be traced back to 1998, when it began as a site for sharing book and music reviews. It has since then evolved into one of the most popular blogging/networking services on the web, with an estimated 27 million users worldwide, largely teenagers. Users are allowed to post any number of weblog entries per day, and they may post comments on other people's journals. Users may also customize how their Xanga looks using pre-made templates. Xanga journals are used for many purposes, most commonly as personal journals.
Flickr	www.flickr.com	Flickr is a digital photo sharing website and web services suite, and an online community platform, which is generally considered an example of a Web 2.0 application. The service is widely used by bloggers as a photo repository. Its popularity has been fueled by its innovative online community tools that allow photos to be tagged and browsed by folksonomic means. Flickr was developed by Ludicorp, a Vancouver, Canada-based company founded in 2002. Ludicorp launched Flickr in February 2004. The service emerged out of tools originally created for Ludicorp's Game Neverending, a web-based massively multiplayer online game. In March 2005, Yahoo! Inc. acquired Ludicorp and Flickr. All content has migrated from servers in Canada to servers in the United States, resulting in all data being subject to United States federal law.
Yahoo! 360°	http://360.yahoo.com	Yahoo! 360° is a personal communication portal similar to Google's Orkut, Friendster and MySpace, currently in beta testing. It integrates features of social networking, blogging, and photo sharing sites. A user may create a personal web site, share their photos from Yahoo! Photos, maintain a blog, a list of local reviews, profile information, and see which friends are currently online. The service launched on March 29, 2005 on an invite-only basis, similar to Gmail. The service removed its invite-only status on June 24, 2005 and has since become available to any Yahoo! user over the age of 18 in the United States, the United Kingdom, France, Germany, Canada, Australia and Japan. Several other Yahoo! properties are integrated with 360° in some fashion. These include: Yahoo! Avatars; Yahoo! Groups; Yahoo! Photos, LAUNCH; Yahoo! Local; Yahoo! Messenger; Flickr Photos; Yahoo! Shopping; Yahoo! Travel; Yahoo! Games. New features introduced with 360°: Themes; Lists; Blasts; Testimonials; and Reviews.
Livejournal.com	www.livejournal.com	LiveJournal is a virtual community where Internet users can keep a blog, journal, or diary. It is also the name of the open source server software that was designed to run it. LiveJournal's differences from other blogging sites include its WELL-like features of a self-contained community and some social networking features similar to but pre-dating Friendster and MySpace. It is based in San Francisco, California. It started in 1999 by Brad Fitzpatrick as a way of keeping his high school friends updated on his activities.
Myyearbook.com	www.myyearbook.com	myYearbook was first created by three high school students, who are only known as Catherine, Dave, and Geoff, during Spring Break of 2005. It was inspired by the typical yearbooks sold in high schools, but was intended to not only keep records of students but also allow

them to keep in contact with one another. The site slowly grew to have a user base numbering in the thousands. myYearbook attempts to be an "improved version of MySpace and Friendster"It is free to register and there are no fees for users. In November of 2005, zenhex.com merged with myYearbook, adding several thousand members and more than doubling the traffic it received. Since then, myYearbook has been growing at a very rapid rate. The site has added a number of successful features like Bully, Flirt, Secretly Admire, Gold Stars, and High-Fives as well as providing every user with a Locker where they can upload video and study documents. The site Zenhex has remained as the forum pool for MyYearbookers & Hexxors with varying topics and forum areas.

Hi5	www.hi5.com	hi5.com is a social networking internet service similar to Friendster and MySpace. Users create an online profile by answering questions and uploading a user picture. Users can send friend requests to other users. When this person receives said friend request, he or she may accept or decline the friend request or block the user altogether. If the user accepts this person as their friend then they will be connected directly or in the 1st degree. The user will then appear on the person's friend list and vice-versa. Users have the option to make their profile viewable only to those people who are in their Network. Your network of friends consists of your direct friends (1st degree), the friends of your direct friends (2nd degree) and the friends of the friends of your direct friends (3rd degree). Other users opt to make their profile available to view to everyone on hi5. h5 consists of the basic features of most networking sites such as messaging, bulletin boards, groups, journals, music (Beta), photos, chat, testimonials and Fives (icons).
Orkut	www.orkut.com	orkut is an Internet social network service run by Google. It claims to be designed to help users meet new friends and maintain existing relationships. Similar to Friendster and MySpace, orkut goes a step further by permitting "communities" of users. It is also invitation-only: users must be invited to join the community by someone who's already there. Orkut was quietly launched on January 22, 2004 by Google. Orkut Büyükkökten, a Turkish software engineer, developed it as an independent project while working at Google. Originally, the orkut community was felt to be elite, because its membership is by invitation only. However, at the end of July 2004 orkut surpassed the 1,000,000 member mark, and at the end of September it surpassed the 2,000,000 mark. While the intended invitation method was e-mail between two acquaintances, invitations to orkut are obtainable via the web, just like Gmail invites. Orkut's use as a social tool is complex, because various people frequently try to add strangers to their own pool of friends, more often than not just to increase the number indicating their number of friends next to their name in their profile.
LinkedIn	www.linkedin.com	LinkedIn is a business oriented social networking site, mainly used for professional networking. As of June 2006, it had more than 6M registered users. LinkedIn's CEO is Reid Hoffman, former Executive Vice President of PayPal. LinkedIn. It is intended to be used to find jobs, people and business opportunities recommended by the user's direct contacts, or by individuals connected to a contact at the 2nd or 3rd degree. The "gated-access approach" (where contact with any professional requires either a pre-existing relationship or intervention of a contact of theirs) is intended to build trust among the service's users. Employers can list jobs on LinkedIn and search for passive candidates and job seekers can review the profile of hiring managers, HR professionals and/or recruiters, and then discover which of their existing contacts can introduce them. More than 1,000 alumni and professional organizations use LinkedIn through members-only areas that facilitate networking among their members. LinkedIn participates in the EU Safe Harbor Privacy Framework and is certified to meet the strict privacy guidelines of the EU. All relationships on LinkedIn are mutually confirmed, and no one appears in the LinkedIn Network without knowledge and explicit consent. LinkedIn is located in Palo Alto and is funded by Greylock and Sequoia Capital.
Friendster	www.friendster.com	Friendster is an internet social network service. The Friendster site was founded in Mountain View, California by Jonathan Abrams in 2002 and is privately owned. Friendster is based on the Circle of Friends technique for networking individuals in virtual communities and demonstrates the small world phenomenon. Friendster was considered the top online social network service until April 2004 when it

		was overtaken by MySpace. In February 2005, Friendster introduced an additional blog service through a cobranded partnership with Six Apart's Typepad service. In October 2005, Friendster also launched a partnership with Grouper Networks that enabled p2p file sharing through a cobranded downloadable client. Friendster has also introduced photo albums and profile tracking.
MIXI	www.mixi.jp	mixi, Inc. is one of several social networking service sites in Japan. The focus of mixi is "community entertainment", that is, meeting new people by way of common interests. Users can send and receive messages, write in a diary, read and comment on others' diaries, organize and join communities and invite their friends. There are more than 4 million members and 490,000 communities by May 2006. A community is a place for people to share their opinions through an online forum and a way to express tastes and hobbies. A footprint ashiato is a function that allows a user to see who has visited their page. mixi is an invitation-only service. However, once invited, membership is free and open to anyone over 18. "Mixi Station", a program that detects songs being played in ITunes and Windows Media Player and uploads them automatically to a communally accessible list in the "Music" section, was implemented in June 2006.