

The University of Texas at Austin - Portugal
An international partnership in graduate education, research, and technology commercialization

Technical Appendix to the Memorandum of Understanding toward a long term partnership

The Government of Portugal and The University of Texas at Austin agree to perform an assessment of possible areas for collaboration, exploring mutual interests in education, research, and technology commercialization projects oriented towards the economic growth of Portugal. The ultimate goal is to establish a long term partnership, which requires the prior assessment of specific interests of The University of Texas at Austin faculty members and researchers as well as those of the Government of Portugal and Portuguese university faculty members, researchers, and institutions. As a result, this Memorandum of Understanding (MOU) defines the terms of reference for the short-term assessment, which is to be performed during a period of up to 4 months looking at long-terms goals and objectives.

1. Long-term collaborative strategy

1.1 Goal: A strategy to strengthen the country's knowledge base, to foster economic growth, and to enhance the quality of life in Portugal by exploring international cooperation and industry-science relationships with leading institutions worldwide in a way that sustains strategic investments in people, knowledge, and ideas.

1.2 Objectives:

- To implement specific initiatives with high visibility and impact in select targeted constituencies, starting with a special focus on advanced digital media and wireless and mobile industries;
- To develop advanced education and research programs at an international level oriented towards strengthening the science base as well as fueling the economy, social well-being, and security;
- To make Portugal an attractive setting in which to study and perform research as well as to invest in technology-based ventures, so that it recruits and retains bright students, scientists, and engineers from throughout the world and helps mobilize higher education institutions and the scientific community toward emerging challenges facing the knowledge economy;
- To reinforce the entrepreneurial capacity of those students, scientists, and engineers through the commercialization of science and technology and access to new and dynamic markets worldwide.

1.3 Rationale:

Portugal is an interesting country in challenging times. The country faces a range of possible futures from the inspiring to the bleak. Keeping the industrial status-quo, still heavily geared toward a strategy of low-cost production, is not a sustainable option in the face of increasing competition from locations such as Eastern Europe and China. Industry must transform and new and qualified employment must be promoted. Fortunately, the evidence provided by a range of emerging technology-based firms created in the mid 1990's is demonstrating the usefulness of prior investments in the science base. But much more progress is needed. This requires that Portugal learn from international experiences

and be engaged with international leaders in innovation systems and organizational transformation. Thankfully, Portugal's unique national challenges are attracting international interest. This proposal aims to build upon that interest for the benefit of both the national economy and Portugal's partners in this endeavor.

The performance of the Portuguese economy is a complex and multifaceted challenge. It is clear that fostering the science base and the growth of emerging technology-based firms, as well as breaking the overall cycle of low productivity/low innovation, is beyond the scope of any single entity. Still, a focused initiative, building on the reputation and accomplishments of leading institutions worldwide in partnership with Portuguese universities, research centers, and firms could go a long way toward meeting three important challenges. First, there is a gap in qualified people and a relatively small critical mass of scientific institutions and innovative enterprises, which exhibits itself in difficult access to new and dynamic markets. Second, there is a gap in understanding about the specific problems and possible solutions that affect the performance of the Portuguese economy. Third, there is a gap in the number and effectiveness of concrete initiatives devoted to taking steps to improve the current situation. The program, with a structure outlined below, aims at bridging this triple gap. It will not, by itself, solve the problem, but it will take important steps to do so by itself, by the partnerships it will propose, and by the demonstration effect it will provide.

The University of Texas at Austin is well-suited to advance collaboration with Portugal. The University of Texas at Austin is one of the world's leading research and educational institutions, particularly well known for its scientific and technological achievements in advanced digital media and communications, for its interdisciplinary and diverse research culture, and for its leading role in the creation of many high-tech companies and entrepreneurship education.

1.4 Strategy:

It is recognized that any development strategy for Portugal must be understood and enacted in the context of a country in an increasingly open and interconnected world. Several currently disjoint disciplines must join efforts to provide new solutions to mobilize people, knowledge, and ideas to help to catalyze strong progress in the engineering applications and management skills needed to secure a prosperous Portugal future.

Thus, a program is proposed to promote and develop new technological competencies to increase Portuguese innovative capacity. This will be accomplished through the development of research, education, and technology commercialization initiatives, which should be implemented in a way to extend the enterprise value chain in advanced digital media and wireless and mobile industries by facilitating strategies for improving competence and capability in two key areas for delivering innovation, namely (a) new product development practices and related processes of larger, established enterprises and firms; and (b) high technology entrepreneurship. In addition, the research programs should encompass activities oriented toward the public's understanding of science and the social appropriation of the knowledge generated.

The collaborative agreement is to be established between Portuguese universities and institutions and The University of Texas at Austin with support from the Portuguese Government. The proposed program should be implemented through an evolutionary and stepwise approach, including short- and medium-term initiatives, in a way to guarantee current opportunities during the launch phase (i.e., year 1), but also to sustain competitive

growth and future development of other potentially emerging opportunities that may appear in the years to come (from the 2nd to 5th year, and beyond). The contractual arrangements to be made should make possible this approach.

1.5 Courses of Action:

The proposed program emphasizes three key aspects in the emerging society, namely:

1. *People*, by fostering tools for understanding and building skills
2. *Knowledge*, by developing understanding for action
3. *Ideas*, by promoting action for results

Each of these aspects is to be implemented through a specific course of action in order to achieve a set of specific goals, including

- *Attract people for knowledge base activities* by fostering new advanced training actions;
- *Enhance the science base* by promoting new research activities at the highest international level;
- *Engage business* by involving key corporate leaders with entrepreneurs and researchers;
- *Connect universities* by promoting industry-science relationships;
- *Promote internationalization* by fostering links with United States and European partners at university and corporate levels and by attracting foreign direct investments;
- *Improve intermediaries* by supporting interface activities fostering industry-science relationships;
- *Foster entrepreneurship* by promoting entrepreneurial culture in the university system, identifying and helping nurturing new ideas, and supporting the creation of new businesses;
- *Promote capital structure* by helping nurture seed and risk capital venturing, namely in the form of a capital network;
- *Change culture* by promoting exchange of ideas and discussion of good and bad practices;

1.6 Main areas of application:

The proposed program will focus on system thinking and transdisciplinary research and education derived from relevant problems facing Portugal and of interest to The University of Texas at Austin, with emphasis on advanced digital media and wireless and mobile industries. It will foster technology commercialization skills and capacity through activities in the following specific fields in the short- and medium-term:

- a) Digital information content and new media production and distribution, including
 - Digital and interactive media, including new distribution systems for small screens and over the Internet;
 - Journalism and documentary systems in interactive environments;
 - Advanced digital media solutions and systems, including wireless technologies and systems for new media distribution and those leading to learning systems for unskilled people;
- b) Innovation research and the process of technical change, encompassing
 - Science and technology commercialization, emphasizing key emerging challenges in high tech entrepreneurship and technology venturing design;
 - Assessing and minimizing the digital divide

In this regard, the assessment will explore the possibility of incubating and accelerating Portuguese technology-based start-up firms and preparing young entrepreneurs and technology managers. Emphasis should be focused on company growth by providing strategic advice and access to new and emerging markets in the United States and worldwide.

These and other potential areas are to be agreed upon and collaborative efforts implemented in a way to allow the continuous monitoring and evaluation of the program as well as launching new areas of application, whenever they rely on well-documented scientific principles and relevant problems for Portugal that are interesting to The University of Texas at Austin.

2. The terms of a “quick assessment”

The University of Texas at Austin will undertake with Portugal an assessment of possible areas for collaboration, exploring areas of mutual interest for the development of education, research, and technology commercialization projects oriented towards the economic growth of Portugal. The assessment will involve visits between faculty/researchers from The University of Texas at Austin and Portugal during a period of up to 4 months (April-July 2006). Such visits might include workshops, seminars, or other interactions to explore mutual intellectual interests. The goal will be to determine desirable areas of collaboration and what would be required to frame successful projects. In addition, The University of Texas at Austin faculty members will advise the Government of Portugal in identifying the Portuguese universities, institutions, and research groups, namely in the form of possible consortia, to be involved in the partnership. The goal is to involve various universities, institutions, and research groups throughout the country, which requires assessment in a way that guarantees the necessary conditions for the successful development of a partnership with The University of Texas at Austin.

The Government of Portugal and The University of Texas at Austin will also explore ways to structure a collaboration including legal, governance, and institutional aspects.

The IC² Institute will be the lead academic and research unit for The University of Texas at Austin during the assessment period and will engage others at The University of Texas at Austin as topics and interests emerge. There cannot be commitment of faculty to education or research initiatives unless faculty members and academic units are involved in the preliminary discussions as well as the negotiations of program details.

The goal will be to develop a proposal for initiatives that can be considered as the basis for a 5 year collaborative agreement.

2.1. Proposed activities (April-July 2006)

2.1.1 Preparation of main areas for advanced education and research

The assessment will explore the possibility of research and education initiatives focusing on the full value chain associated with advanced digital media and wireless and mobile industries, as well as any other intellectual area relevant to Portugal and of interest to The University of Texas at Austin. The following specific fields will be included in the assessment from a short- and medium-term perspective:

a) Digital information content and new media production and distribution, including:

- Digital and interactive media, including new distribution systems for small screens and over the Internet;
 - Journalism and documentary systems in interactive environments;
 - Advanced digital media solutions and systems, including wireless technologies and systems for new media distribution and those leading to learning systems for unskilled people;
- b) Innovation research and the process of technical change, encompassing:
- Science and technology commercialization, emphasizing key emerging challenges in high technology entrepreneurship and technology venturing design;
 - Assessing and minimizing the digital divide

The goal is to plan (professional) post-graduate degree programs with a duration from 10 to 18 months, to be associated whenever possible with future doctoral programs.

The assessment should consider the development of advanced research programs to be conducted according to the highest scientific demands, including publications in leading international peer-reviewed journals and in a way to facilitate strengthening Portuguese research institutions.

The assessment should also look at other areas of possible interest for Portugal and The University of Texas at Austin. The assessment should consider how any collaborative efforts could be implemented to allow for the continuous monitoring, evaluation, and adjustment of the programs.

2.1.2 – Technology Commercialization

Inspired by the experience of the IC² Institute and the Austin Technology Incubator (ATI), the assessment will explore the possibility of incubating and accelerating Portuguese technology-based start-up firms and preparing young entrepreneurs and technology managers. Emphasis should be focused on company growth by providing strategic advice and access to new and emerging markets in the United States and worldwide.

2.1.3 – Institution-Building

The assessment should include the analysis of the possibilities for institution-building of:

- An advanced digital media laboratory or institute in Portugal involving a consortium of Portuguese research centers and schools through collaboration with the *University of Texas Film Institute*, the *Digital Media Collaboratory* and/or the *Wireless Research Center*, as well as other units at The University of Texas at Austin.
- Technology transfer offices and innovation centers in Portuguese higher education institutions, through collaboration with the IC² Institute and the Austin Technology Incubator.

2.1.4 – Potential instruments to be assessed for the medium-term

- Student exchange: a scheme to offer undergraduates in Portuguese institutions and The University of Texas at Austin the opportunity to study at the other institution for 6 to 12 months. It may involve a program for internships of Portuguese and The University of Texas at Austin students at leading American and Portuguese firms in a way to promote new experiences to quality graduates.
- Research opportunities for students (undergraduate and postgraduate): to encourage students at Portuguese institutions and The University of Texas at

Austin to step outside the classroom and engage in faculty research projects, respectively at The University of Texas at Austin and Portuguese Institutions.

- One-year post-graduate degree programs: expand the offer of professional graduate programs, to be inspired by those at The University of Texas at Austin, in order to promote training of future leaders. All courses should aim to offer both technical depth and business breadth.
- Joint Ph.D. Program: develop a joint program at the Ph.D level, to be conducted according to the highest scientific and educational demands, bringing together key players in various Portuguese universities and research centers, that will work in close collaboration with faculty members at The University of Texas at Austin.
- “Research Chairs”: a scheme for fellowships for The University of Texas at Austin and Portuguese professors to exchange experiences and teach and guide research through visits from 6 to 12 months.
- Technology management fellowships: a scheme to provide visits for technology managers at Portuguese institutions and at The University of Texas at Austin from 3 to 6 months to foster new collaborative efforts with entrepreneurs at The University of Texas at Austin and in Portugal.
- Curriculum development: a scheme to sponsor projects that transfer successful course materials and faculty expertise from The University of Texas at Austin to Portuguese institutions, and vice versa, or establish new courses to be taken at both.
- Executive education: expand the offer of an “Executive Development Series” of short courses open to executives in Internet and software industries and systems.
- Develop integrated knowledge communities: expand research programs to other areas, deepening knowledge generation processes and enlarging the network of Portuguese research groups working with researchers at The University of Texas at Austin. The work to be developed in this area aims to foster projects through which firms can engage in research and development activities, both in-house and through tight collaborations with the research system in Portugal and at The University of Texas at Austin. There will be a focus on new ideas in applied science, engineering, and broader technologies. Attention should also be focused on:
 - Work on broad-based problems that require innovative solutions, or a better understanding, in order for policy recommendations to be suggested;
 - Areas where comparison and knowledge sharing with the United States may be of particular relevance to Portugal;
 - Partnerships with leading United States and European companies, broadening The University of Texas at Austin - Portugal collaboration to international leaders and corporations;
 - Analyzing and attempting to solve problems with research conducted according to the highest scientific demands, with publications in leading international peer-reviewed journals.

Envisioned research programs, among others, may include the following topics:

- Advanced digital media production and distribution
- Documentary systems in interactive environments
- Aging and the development of inclusive technologies and systems for the elderly
- Technology commercialization and high tech entrepreneurship

All research activities and programs should encompass activities of knowledge diffusion oriented for the population at large in a way that promotes the public's understanding of science and facilitates social appropriation of the knowledge generated.

- Technology transfer and entrepreneurial ventures and businesses: attracting science, engineering, and management students, as well as investors worldwide, and engaging technically sophisticated young people in new technology-based firms by promoting joint initiatives involving Portuguese institutions and the Austin Technology Incubator and the IC² Institute, including:
 - Support and promotion of initiatives for the identification and mobilization of innovative technologies in Portuguese universities with commercial potential
 - Joint entrepreneurship competitions;
 - Support and promotion of a program of internships of Portuguese students in American start-up firms, primarily during summer periods;
 - Support and promotion of a series of training programs on “technology-based entrepreneurship,” followed by a “venture design competition”;
 - Support an international annual prize for new ideas for technology-based firms developed cooperatively by students at Portuguese institutions and The University of Texas at Austin;

2.1.5 Planning Governance and institutional mechanisms

The assessment will involve analyzing ways to structure a collaboration, including legal, governance, and institutional aspects.

- Governance

The institutional framework governing The University of Texas at Austin - Portugal partnership should be discussed and assessed in terms of other practices followed by The University of Texas at Austin worldwide. In particular, the establishment of a private foundation should be carefully assessed, as well as its organization and structure.

- Legal issues of property protection

Legal issues associated with The University of Texas at Austin - Portugal partnership, including intellectual property protection aspects, should be discussed and defined.

- Continuous monitoring and evaluation

The overall collaborative program, as well as specific tasks, is to be monitored and evaluated, making use of an external peer-review committee. An overall biannual review will be planned to guide the development of the program, as well as its restructuring whenever necessary. In addition, the launching of new actions is subject to the analysis of the external committee.

3. Action Plan and Timing

The objectives mentioned above require the establishment of an action plan, as follows.

- April-July 2006: Preparation and design of the potential terms of reference for a future contract.
- April-July 2006: Preparation and design of governance system for a future contract.
- April-July 2006: Preparation and design of legal issues for a future contract.
- May-July 2006: Preparation of contract.
- August 2006: Signing of official contract and public presentation of detailed action plan.

4. Outcomes

By the end of the 4 month period specified for the assessment, The University of Texas at Austin will submit to the Portuguese Government a report with the results of the work in the various topics described in 2.1 above and that includes the following details:

- Preparation of the potential areas for advanced education and research
- Preparation of technology commercialization activities and support to Portuguese start-up firms
- Institution-building for an advanced digital media laboratory or institute in Portugal
- Institutional building of technology transfer offices and innovation centers in Portuguese higher education institutions
- Assessing other areas and programs for potential collaboration
- Planning governance and institutional mechanisms

The report should include the identification of the various consortia of Portuguese institutions and teams to be involved in each activity to be considered. It should also include a draft of the proposed contract and related technical appendix for the expected partnership to be established between the Government of Portugal and The University of Texas at Austin.