

REQUEST FOR PROPOSALS

**TECHNICAL ASSISTANCE FOR THE
ROMANIA: INTEGRATED NETWORK FOR
EDUCATION AND TECHNOLOGIES PROJECT**

Submission Deadline: **4:00 PM**
LOCAL TIME
NOVEMBER 3, 2008

Submission Place: MINISTER CRISTIAN ADOMNIȚEI
MINISTRY OF EDUCATION, RESEARCH AND YOUTH
STR. GEN. BERTHELOT 28-30
SECTOR 1, 70738 BUCHAREST
ROMANIA

PHONE: +40 (21) 310 4320
FAX: +40 (21) 314 2860

SEALED PROPOSALS SHALL BE CLEARLY MARKED AND RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.

REQUEST FOR PROPOSALS

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Section 1: INTRODUCTION

The U.S. Trade and Development Agency (USTDA) has provided a grant to the Romanian Ministry of Education, Research and Youth (Grantee) for the development of an Integrated Network for Education and Technologies (INET) project. INET's design and implementation will represent an upgrade to existing networks and IT infrastructure at schools, universities and research centers to help develop students' skills to satisfy the growing needs of employers as well as the nation's need for improved innovation. The grant agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to carry out the Technical Assistance.

1.1 BACKGROUND SUMMARY

The Ministry of Education, Research and Youth (MOER) requested technical assistance for the development of the INET project. The purpose of INET is to design a program to upgrade existing networks and IT infrastructure at schools, universities and research centers throughout Romania to help develop students' skills to satisfy the growing needs of employers as well as the nation's need for improved innovation. The Technical Assistance will identify a strategic framework and a broad profile of the IT skills demanded by the private sector in Romania. This framework will help determine the immediate and long-term needs of academic and private sector training programs. The Technical Assistance will also determine the functionalities of the network to host INET and develop a three-phased implementation plan for INET to support the planned training. The Technical Assistance will then determine the equipment needed to upgrade and re-equip IT labs and network infrastructures to meet immediate needs of private firms, and the Technical Assistance will develop specifications for tenders to execute necessary upgrades at IT labs at primary and secondary schools, universities and research centers over the longer term. Finally, the Technical Assistance will develop a framework for monitoring the developmental impacts of the MOER's resource allocations for INET. A background Definitional Mission is provided for reference in Annex 2.

1.2 OBJECTIVE

Achievement of competitiveness goals specified in the National Development Plan (2007-2013) drives the concept of the INET project. The Government of Romania, through the MOER, is interested in a comprehensive upgrade to create synergies using existing technological infrastructure in order to meet economy-wide market needs. Rather than provide independent/separate assistance to the primary, secondary and university level networks, the MOER aims to develop a single, unified approach to guide the development of existing networks. This Technical Assistance seeks to help the MOER achieve this goal by spearheading the development of INET. INET will enable users, trainers and administrators at schools, universities, research centers and private firms to access and share resources to improve the overall quality of education. It will also help exploit modern distance-, e-learning and training techniques across Europe and the U.S., and enhance prospects for competitive job growth for Romanian youth. This project will furthermore provide the basis for Romania to develop a "knowledge economy" fully utilizing IT networks and shared capacities.

INET seeks to re-equip existing education and research networks with modern functionalities to enable e-learning and sharing of know-how with knowledge-based enterprises. It will provide students greater exposure to the skill-sets they need to compete in the knowledge economy via access at research centers, universities and schools. Implementation is to take place in three phases to reflect the primary needs of three user groups. The MOER and research bodies would manage links between education, research and the economy; universities would network the IT labs serving higher education users; and secondary and primary schools would integrate and share resources via INET which would complement the ongoing NES Data Network project sponsored by Oracle. [Oracle has signed a memorandum of understanding with the MOER to provide \$10 million of support to redevelop the IT curriculum at secondary schools and train 150 secondary IT teachers, a project which the company refers to as the NES Data Network project.] The Terms of Reference (TOR) for this Technical Assistance is attached as Annex 4.

1.3 PROPOSALS TO BE SUBMITTED

Technical proposals are solicited from interested and qualified U.S. firms. The administrative and technical requirements as detailed throughout the Request for Proposals (RFP) will apply. Specific proposal format and content requirements are detailed in Section 3.

COST will not be a factor in the evaluation and therefore, cost proposals should not be submitted; upon detailed evaluation of technical proposals, one firm will be selected for contract negotiations. The amount for the negotiated contract has been established by a USTDA grant of U.S. \$366,841.

1.4 CONTRACT FUNDED BY USTDA

The negotiated contract will be funded by USTDA in accordance with the terms and conditions of its grant to the Grantee. The contract must include certain USTDA mandatory clauses relating to nationality, taxes, payment, reporting, and other matters. The USTDA nationality requirements and the USTDA mandatory clauses are attached at Annexes 3 and 4 for reference.

Section 2: INSTRUCTIONS TO PROPOSERS

2.1 PROJECT TITLE

The project is called "Romania: Integrated Network for Education and Technologies."

2.2 DEFINITIONS

Please note the following definitions of terms as used in this RFP.

The term "Request for Proposals" means this solicitation of a formal technical proposal including qualifications statement.

The term "Offeror" means the U.S. individual, or U.S. firm, including any and all subcontractors, which responds to the RFP and submits a formal proposal and which may or may not be successful in being awarded this procurement.

2.3 DEFINITIONAL MISSION REPORT

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. A copy of the Report is attached at Annex 2 for background information only.

2.4 EXAMINATION OF DOCUMENTS

Offerors should carefully examine this RFP. It will be assumed that Offerors have done such inspection and that through examinations, inquiries and investigation they have become familiarized with local conditions and the nature of problems to be solved during the execution of the Technical Assistance.

Offerors shall address all items as specified in this RFP. Failure to adhere to this format may disqualify an Offeror from further consideration.

Submission of a proposal shall constitute evidence that the Offeror has made all the above mentioned examinations and investigations, and is free of any uncertainty with respect to conditions which would affect the execution, and completion of the Technical Assistance.

2.5 PROJECT FUNDING SOURCE

The Technical Assistance will be funded under a grant from USTDA. The total amount of the grant is not to exceed U.S. \$366,481.

2.6 RESPONSIBILITY FOR COSTS

Offeror shall be fully responsible for all costs incurred in the development and submission of the proposal or any other cost incurred by Offeror prior to issuance of an agreement or contract. Neither USTDA nor the Grantee assumes any contractual obligation as a result of the issuance of this proposal request, the preparation or submission of a proposal by an Offeror, the evaluation of proposals, or final selection.

2.7 TAXES

Offerors should submit proposals which note that in Annex 4, USTDA Mandatory Contract Provisions, USTDA funds are not to be used to pay taxes or duties under the laws of host country.

2.8 CONFIDENTIALITY

The Grantee will use its best efforts to preserve the confidentiality of any business proprietary or confidential information submitted by the Offeror, which is clearly designated as such by the Offeror.

2.9 ECONOMY OF PROPOSALS

Proposal documents should be prepared simply and economically, providing a comprehensive and concise description of the Offeror's capabilities to satisfy the requirements of the RFP. There is no necessity for expensive bindings, colored displays, or other promotional material unless such material is absolutely pertinent to the proposal. Emphasis should be placed on completeness and clarity of content.

2.10 SUBSTANTIVE PROPOSALS

The Offeror shall certify (a) that its proposal is genuine and is not made in the interest of, or on the behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with, and agreement of, any undisclosed group, association, organization, or corporation; (b) that it has not directly or indirectly induced or solicited any other Offeror to put in a false proposal; (c) that it has not solicited or induced any other person, firm, or corporation to refrain from submitting a proposal; and (d) that it has not sought by collusion to obtain for himself any advantage over any other Offeror or over the Grantee or USTDA or any employee thereof.

2.11 CONDITIONS REQUIRED FOR PARTICIPATION

Only U.S. firms are eligible to participate in this tender. However, U.S. firms may utilize subcontractors from host country for up to 20 percent of the amount of the USTDA grant. USTDA nationality requirements are detailed in Annex 3.

2.12 LANGUAGE OF PROPOSAL

All proposal documents shall be prepared and submitted in English, and only English.

2.13 PROPOSAL SUBMISSION REQUIREMENTS

The **Cover Letter** in the proposal must be addressed to:

**Minister Cristian Adomniței
Ministry of Education, Research and Youth
Str. Gen. Berthelot 28-30
Sector 1, 70738 Bucharest
Romania**

**Phone: +40 (21) 310 4320
Fax: +40 (21) 314 2680**

An Original and eight (8) copies of your proposal must be received at the above address no later than 4:00 pm local time, on November 3, 2008.

Proposals may be either sent by mail, overnight courier, or hand-delivered. Whether the proposal is sent by mail, courier or hand-delivered, the Offeror shall be responsible for actual delivery of the proposal to the above address before the deadline. Any proposal received after the deadline will be returned unopened.

Upon timely receipt, all proposals become the property of the Grantee.

2.14 PACKAGING

Each proposal must be sealed to ensure confidentiality of the information. The proposals should be individually wrapped and sealed, and labeled for content including "original" or "copy number x"; the original and eight (8) copies should be collectively wrapped and sealed, and clearly marked for content.

Neither USTDA nor the Grantee will be responsible for premature opening of proposals not properly labeled.

2.15 AUTHORIZED SIGNATURE

The proposal must contain the signature of a duly authorized officer or agent of the Offeror empowered with the right to bind the Offeror.

2.16 EFFECTIVE PERIOD OF PROPOSAL

The proposal shall be binding upon the Offeror for sixty (60) days after the proposal due date, and Offeror may withdraw or modify this proposal at any time prior to the due date upon written request, signed in the same manner and by the same person who signed the original proposal.

2.17 EXCEPTIONS

Firms agree by their response to the RFP announcement to abide by the procedures set forth therein. Material modifications in the TOR or responsibilities of the parties will not be accepted.

Any exceptions in the proposal shall be clearly identified, and shall include the scope of such exception, and its impact, on the procurement. The Grantee shall make final determination as to the responsiveness of such exceptions and their acceptability.

2.18 OFFEROR QUALIFICATIONS

As provided in Section 3, Offerors shall submit evidence that they have relevant past experience and have previously delivered advisory and Technical Assistance services similar to those required in the TOR.

2.19 RIGHT TO REJECT PROPOSALS

The Grantee reserves the right to reject any and all proposals and to accept or reject any or all of the items in the proposal, and to award the contract in whole or in part if it is deemed in the best interest of the Grantee.

2.20 PRIME CONTRACTOR RESPONSIBILITY

Offerors have the option of subcontracting parts of the services they propose. The Offeror's proposal must include a description of any anticipated subcontracting arrangements, including the name, address, and qualifications of consultants and subcontractors. USTDA nationality provisions are set forth in detail in Annex 3. The successful Offeror shall cause appropriate provisions of its contract, including all mandatory USTDA clauses, to be inserted in all subcontracts ensuing to ensure fulfillment of all contractual provisions by subcontractors.

2.21 AWARD

An award resulting from this RFP shall be made to the best qualified Offeror, taking into consideration the evaluation factors set forth herein; however, the right is reserved to reject any

and all proposals received and, in all cases, the Grantee will be the judge as to whether a proposal has or has not satisfactorily met the requirements of this RFP.

2.22 COMPLETE SERVICES

The successful Offeror shall be required to (a) furnish all supplies, supervision, transportation, and other execution accessories, services, and facilities; (b) provide and perform all necessary labor; and (c) in accordance with good technical practice, with due diligence, and in accordance with the requirements, stipulations, provisions and conditions of this RFP and the resultant contract, execute and complete all specified work to the satisfaction of the Grantee.

2.23 INVOICING AND PAYMENT

Deliverables under the contract shall be delivered on a schedule to be agreed upon in a contract with the Grantee. The Contractor may submit invoices to the designated Grantee Project Director in accordance with a schedule to be negotiated and included in the contract. Upon approval of each invoice, the Grantee will forward the invoice to USTDA which will process payment to the Contractor. All payments by USTDA under the Grant Agreement will be made in U.S. currency.

Section 3: PROPOSAL FORMAT AND CONTENT

To expedite proposal review and evaluation, and to assure that each proposal receives the same orderly review, all proposals must follow the format described in this section.

Proposal sections and pages shall be appropriately numbered and the proposal shall include a Table of Contents. Offerors are encouraged to submit concise and clear responses to the RFP. Proposals shall contain all elements of information requested without exception. Instructions regarding the required scope and content are given in this section. The Grantee reserves the right to include any part of the selected proposal in the final contract.

The proposal shall consist of a technical proposal only. No cost proposal is required as the value of the USTDA grant is established at U.S. \$366,841.

Offerors shall submit one (1) original and eight (8) copies of the proposal. Proposals received by fax cannot be accepted.

The following sections and content are required for each proposal:

- Transmittal Letter,
- Cover/Title Page,
- Table of Contents,
- Introduction and Executive Summary,
- Company Information,
- Organizational Structure, Management Plan, and Key Personnel,
- Technical Approach and Work Plan,
- Experience and Qualifications, and
- Miscellaneous.

Detailed requirements and directions for the preparation of each section are presented below.

3.1 SECTION 1: INTRODUCTION AND EXECUTIVE SUMMARY

An Executive Summary should be prepared describing the major facts or features of the proposal, including any conclusions, assumptions, and generalized recommendations the Offeror desires to make. Offerors are requested to limit the length of the Executive Summary to no more than five (5) pages.

3.2 SECTION 2: COMPANY INFORMATION

3.2.1 Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), similar information must be provided for each subcontractor. Offerors are requested to limit the length of the Company Profile Information to one (1) page per firm.

1. Name of firm and business address, including telephone and fax numbers.
2. Year established (include former firm names and year established, if applicable).
3. Type of ownership and parent company, if any.
4. Project Manager's name, address, telephone and fax number, if different from (1).

3.2.2 Offeror's Authorized Negotiator

Provide name, title, address, telephone and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

3.2.3 Negotiation Prerequisites

1. Discuss any impact of any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Technical Assistance as proposed and within the project schedule.
2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

3.3 SECTION 3: ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL

Describe the Offeror's proposed project organizational structure. Discuss how the project will be managed including the principal and key staff assignments for this Technical Assistance. Identify the Project Manager who will be the individual responsible for this project. The Project Manager must have the responsibility and authority to act on behalf of the Offeror in matters related to the proposed Technical Assistance.

Provide a listing of personnel (including subcontractors and consultants) to be engaged in the project, either U.S. or local with the following information for key staff: position in the project; pertinent experience, curriculum vitae; other relevant information. If subcontractors are to be used, the organizational relationship between the firms must be described.

A manpower schedule and the level of effort for the project period, by activities and tasks, as detailed under the Work Plan shall be submitted. A statement confirming the availability of the proposed project manager and key staff over the duration of the project must be included in the proposal.

3.4 SECTION 4: TECHNICAL APPROACH AND WORK PLAN

Describe in detail the proposed technical approach and work plan. Discuss the project requirements as perceived by the Offeror. Include a brief narrative of tasks within each activity series. Begin with the information gathering phase and continue through delivery and approval of all required reports.

Prepare a detailed schedule of performance that describes all activities and tasks within the Technical Work Plan, including periodic reporting or review points, incremental delivery dates, and other project milestones.

Based on the Technical Work Plan, and previous project experience, explain when and where Offeror will require support from the Grantee. Detail the amount of staff time required by the Grantee or participating agencies and any work space or facilities needed to complete the Technical Assistance.

3.5 SECTION 5: EXPERIENCE AND QUALIFICATIONS

Provide a discussion of the Offeror's experience and qualifications which are relevant to the objectives and TOR for the Technical Assistance. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project. Relevant experience and qualifications of key staff proposed shall be provided including letters of commitment from the individuals proposed concerning their availability for contract performance.

As many as possible but not more than six (6) relevant and verifiable project references must be provided, including the following information:

- Project name,
- Name and address of client (indicate if joint venture),
- Client contact person (name/ position/ current phone and fax numbers),
- Period of Contract,
- Description of services provided,
- Dollar amount of Contract, and
- Status and comments.

Offerors are strongly encouraged to include in their experience summary primarily those projects that are similar to or larger in scope than the Technical Assistance as described in this RFP.

Section 4: AWARD CRITERIA

Individual proposals will be initially evaluated by a Procurement Selection Committee of representatives from the Grantee. The Committee will then conduct a final evaluation and completion of ranking of qualified Offerors, and the Grantee shall promptly negotiate a contract with the best qualified Offeror. If a satisfactory contract cannot be negotiated with the best qualified Offeror, negotiations will be formally terminated. Negotiations shall then be undertaken with the second most qualified Offeror and so forth.

The selection of the Contractor will be based on the following criteria:

1. Experience advising academic institutions in implementing e-learning, modern teaching methods and best practices to link innovative, R&D driven academic environments with operational skills needed by global, knowledge-based enterprises. Experience operating e-learning, distance learning, content management technologies, application suites and operating systems to address training needs in globally-recognized competencies. Experience implementing programs and systems for online student, faculty and course administration is equally important as that in designing network and systems configurations to meet rapidly changing content delivery requirements. Experience balancing IT infrastructure design and configuration with academic and human resource development using e-learning techniques. Experience in Europe, especially in programs financed by the European Union, would be advantageous, as would be similar experience in Romania or partnerships with Romanian academic institutions. (25 points)
2. Experience advising national academic and economic policymakers on strategies to make education relevant for innovation and national competitiveness. Experience with programs such as the American Competitiveness Initiative or the Lisbon Agenda and related knowledge-based industrial employment-generating strategies pursued by EU members. Experience assessing the efficacy of e-learning techniques introduced for professional training, continuing education and lifelong learning arrangements that extend innovations and research to knowledge-based enterprises. (20 points)
3. Experience advising on national human resource development strategies and/or managing skill development programs for major corporations operating globally. Experience evaluating e-learning, distance learning or other ICT-enabled techniques to create needed competencies nationally. Experience in national human resource planning engagements or staffing efforts of major, globally-competing U.S. or European firms. Experience profiling and advising on overall competency and skill developments for knowledge-based industries, especially in Eastern Europe. (20 points)
4. Experience designing, planning and implementing optimized and integrated networking solutions, especially for e-learning. Experience with ADL/SCORM-compatible Learning and Content Management Systems prevalent in the U.S. and Europe, as well as emerging open standards and intelligent networking applications. Experience with enterprise networking solutions for global knowledge-based industry clients and/or managing network operations of a large university system. Experience contracting through Service Level Agreements to manage existing systems and implement new systems without interruptions. Experience evaluating new technologies and network architectures (solutions) to determine if they contribute to network optimization. Systems integration

experience in e-learning networking for major U.S. IT firms at their training centers in Europe. (20 points)

5. Expertise in project and acquisitions planning for major network upgrades at a national level. Project appraisal and planning experience in academic, training or skill development projects involving new technologies. Experience with international project procurement planning and development of tenders to meet financier requirements, preferably for public-private partnerships and results-oriented contracting. Experience working with European Union or Romanian projects. (15 points)

Proposals which do not include all requested information may be considered non-responsive.

Price will not be a factor in contractor selection.

ANNEX 1

Minister Cristian Adomniței, Ministry of Education, Research and Youth, Str. Gen. Berthelot 28-30, Sector 1, 70738 Bucharest, Romania, Phone: +40 (21) 310 4320, Fax: +40 (21) 314 2680

R - ROMANIA: INTEGRATED NETWORK FOR EDUCATION AND TECHNOLOGIES

POC Evangela Kunene, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. Romania: Integrated Network for Education and Technologies (INET). The Grantee invites submission of qualifications and proposal data (collectively referred to as the "Proposal") from interested U.S. firms which are qualified on the basis of experience and capability to provide technical assistance with the development of INET, whose design and implementation will represent an upgrade to existing networks and IT infrastructure at schools, universities and research centers to help develop students' skills to satisfy the growing needs of employers as well as the nation's need for improved innovation.

In Romania, the Ministry of Education, Research and Youth (MOER) coordinates and controls the national educational system through one or more of its subordinate agencies and specialized offices. Technical Assistance for the INET project will identify a strategic framework and a broad profile of the IT skills demanded by the private sector in Romania. This framework will help determine the immediate and long-term needs of academic and private sector training programs. The Technical Assistance will also determine the functionalities of the network to host INET and develop a three-phased implementation plan for INET to support the planned training. The Technical Assistance will then determine the equipment needed to upgrade and re-equip IT labs and network infrastructures to meet immediate needs of private firms, and the Technical Assistance will develop specifications for tenders to execute necessary upgrades at IT labs at primary and secondary schools, universities and research centers over the longer term. Finally, the Technical Assistance will develop a framework for monitoring the developmental impacts of the MOER's resource allocations for INET.

The Grantee requires the services of a Contractor to complete the following Tasks under this Technical Assistance. The Contractor shall:

- Task I: Develop the Planning Framework
- Task II: Develop the Profile of Skill Demands
- Task III: Develop Network Functionalities and Parameters
- Task IV: Prepare Tender Documents:
- Task V: Development Impact Assessment
- Task VI: Prepare Final Report

The U.S. firm selected will be paid in U.S. dollars from a \$366,841 grant to the Grantee from the U.S. Trade and Development Agency (USTDA).

A detailed Request for Proposals (RFP), which includes requirements for the Proposal, the Terms of Reference, and a background definitional mission report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the

RFP in PDF format, please go to:

<https://www.ustda.gov/USTDA/FedBizOpps/RFP/rfpform.asp>. Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time for preparation of an adequate response. Firms that want USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the RFP. Firms that want to send a courier to USTDA to retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA.

Only U.S. firms and individuals may bid on this USTDA financed activity. Interested firms, their subcontractors and employees of all participants must qualify under USTDA's nationality requirements as of the due date for submission of qualifications and proposals and, if selected to carry out the USTDA-financed activity, must continue to meet such requirements throughout the duration of the USTDA-financed activity. All goods and services to be provided by the selected firm shall have their nationality, source and origin in the U.S. or host country. The U.S. firm may use subcontractors from the host country for up to 20 percent of the USTDA grant amount. Details of USTDA's nationality requirements and mandatory contract clauses are also included in the RFP.

Interested U.S. firms should submit their Proposal in English directly to the Grantee by 4:00 pm local time on November 3, 2008 at the above address. Evaluation criteria for the Proposal are included in the RFP. Price will not be a factor in contractor selection, and therefore, cost proposals should NOT be submitted. The Grantee reserves the right to reject any and/or all Proposals. The Grantee also reserves the right to contract with the selected firm for subsequent work related to the project. The Grantee is not bound to pay for any costs associated with the preparation and submission of Proposals.

ANNEX 2

**ROMANIA
INFORMATION TECHNOLOGY / E-LEARNING
DEFINITIONAL MISSION**

**CONTRACT NO: USTDA – 07-C-81-023
FINAL REPORT**

JUL 25 2007

**SUBMITTED TO:
U.S. TRADE AND DEVELOPMENT AGENCY
1000 WILSON BOULEVARD, SUITE 1600
ARLINGTON, VA 22209
TELEPHONE: (703) 875-4357**

**SUBMITTED BY:
SERVICE ASSOCIATES INTERNATIONAL, INC.
1333 CAVENDISH DRIVE
SILVER SPRING, MD 20905, U.S.A.
PHONE: (301) 384 - 8834 ♦ E-MAIL: SAL.INC@VERIZON.NET
JUNE 27, 2007**

S. Coppi



This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government. The opinions, findings, conclusions, or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report.



The U.S. Trade and Development Agency

The U.S. Trade and Development Agency (USTDA) advances economic development and U.S. commercial interests in developing and middle income countries. The agency funds various forms of technical assistance, early investment analysis, training, orientation visits and business workshops that support the development of a modern infrastructure and a fair and open trading environment.

USTDA's strategic use of foreign assistance funds to support sound investment policy and decision-making in host countries creates an enabling environment for trade, investment and sustainable economic development. Operating at the nexus of foreign policy and commerce, USTDA is uniquely positioned to work with U.S. firms and host countries in achieving the agency's trade and development goals. In carrying out its mission, USTDA gives emphasis to economic sectors that may benefit from U.S. exports of goods and services.

Mailing and Delivery Address: 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901
Phone: 703-875-4357 • **Fax:** 703-875-4009 • **Web site:** www.ustda.gov • **email:** info@ustda.gov

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EXECUTIVE SUMMARY

This Definitional Mission (DM), conducted for the United States Trade and Development Agency (USTDA), assesses the request for assistance it received from Romania's Ministry of Education and Research (MoER) in early 2006. As per its Scope of Work, the DM Contractor, Service Associates International, Inc. (SAI) reviewed the plans proposed by the MoER to network Romania's academic facilities to better equip its graduates with skills relevant for the knowledge economy and recommend any justifiable assistance based on established USTDA criteria. Accordingly, SAI's IT and E-learning specialist Mr. Trib Narain held substantive discussions from February 25 - March 7, 2007 in Bucharest. He met decision-makers for schools and university programs and senior officials at MoER to assess their proposals to network IT facilities to better complement private sector training initiatives for developing skills relevant for the new economy. The assessment of the DM would not have been possible without the knowledge of issues on the ground and assistance that Ms. Doina Brancusi, Senior Specialist of the U.S. Commercial Services provided, especially in meetings with the Ministry and U.S. firms.

Although Romania has invested substantially in IT infrastructure for education and actively pursued economic, academic and institutional reforms (see Annex I) under the Bologna Process, its graduates lack those IT skills which are increasingly being recognized as an entry ticket to the new job markets. Private firms are investing in training Romanian graduates in specific job related skills. This enlarges the pool of available knowledge economy workers and enables Romania to contribute more effectively towards EU's Lisbon Strategy of European competitiveness. U.S. IT firms are leading such private style training initiatives and their success, especially Oracle's, in working with MoER is increasingly attracting European firms in other sectors also. Under a typical Memorandum of Understanding (MOU) with MoER, firms furnish training resources as corporate investments to impart needed IT skills alongside established secondary and or tertiary curricula supported by the MoER budget. Successful MOUs with Cisco, Oracle and Microsoft have enabled students to exploit modern networked learning environments to develop innovative and creative skills drawing upon other core disciplines they have studied. As a result, their IT skills have broadened their employment potential in other industries. This has attracted technology-based employers like Alcatel, Infineon, Schlumberger, Siemens and Solectron to follow U.S. IT firms and set up centers and programs to deliver more job specific training to help staff their global, innovation driven operations.

To gear up education and training for the knowledge economy MoER proposes to exploit existing IT infrastructure at academic and research facilities better and strengthen links between education, R&D and innovation. It also needs to manage and allocate public resources better towards this effort and more effectively leverage ongoing public and private initiatives. Oracle is sponsoring PhD students and engaging school goes to innovate in IT enabled environments; the World Bank Knowledge and Economy project is extending ICT access to knowledge-disadvantaged areas and integrating skills with small enterprises; and the Gates Foundation is networking all libraries to extend their access in the public domain. All complement a well-integrated learning network as numerous elements are already in place, although some are obsolete. Integrating and upgrading them would enable Romanians to make Europe more competitive also. Links with European education and research centers would also facilitate mobility of Romanian students across Europe as well as their lifelong learning to integrate its work force and help meet long-term EU competitiveness targets.

Towards this, MoER is interested in a comprehensive project that leverages the available synergies to meet economy wide market needs. It wishes to develop the existing networks to meet National Development Plan (2007-13) targets for raising competitiveness. The DM's assessment also confirms a single vision and approach to guide the development of existing networks. Such a framework would better ensure the impact intended by EU and Romanian development policies. This proposed MoER project (the Project) -- Integrated Network for Education and Technologies (INET) -- will enable users, trainers and administrators at schools, universities, research and enterprises to access and share resources to improve overall quality of education. The Project will help exploit modern distance-, e-learning and training techniques across Europe and enhance prospects for competitive jobs and growth for Romanian youth.

The Minister has reiterated MoER's commitment to the Project (INET) and the DM's assessment is that USTDA assistance would best help MoER design and plan a feasible Project to deliver the impact called for in its development plans and EU commitments. Therefore the DM recommends a USTDA grant covering costs for Technical Assistance (TA) activity sponsored by the Minister of Education and Research as the Grantee, as requested in his recent letter (Annex II) . The budget for this recommended Technical Assistance activity is an estimated US\$366,841.

The recommended TA will first identify the strategic framework and a broad profile of the IT skills demanded by the private sector in Romania. This will help stage the immediate and long-term needs of academic and private sector training programs. Next, the TA would establish network functionalities for INET and a phased implementation plan of the Project to support the planned training. The TA will then identify procurements to upgrade and re-equip IT labs and infrastructures to meet immediate needs of private firms and develop specifications for tenders to execute necessary upgrades at IT-labs in schools, universities and research centers over the longer term. Finally, the TA will develop a framework for monitoring the development impact of MoER resource deployments envisaged by the Project.

The DM also recommends that the USTDA organize an Orientation Visit (OV) following the TA to help MoER decision makers implement recommendations of the TA Contractors. The OV will help Romanian decision makers assess best practices and technology solutions for managing content, applications and software for modern education, enhanced learning and knowledge sharing arrangements.

The following DM assessments detailed in sections that follow, justify the above recommendations:

- (a) **Project Description:** The INET Project will upgrade existing networks and IT infrastructure in schools, universities and research centers to help MoER meet more immediate skill needs of employers as well as training and innovation needs over the long term. This Project addresses the initial MoER requirement for two projects (NES and University IT Labs) along with the three additional proposals the DM reviewed during its visit (University e-governance, pre-university and primary school mobility systems). The combined INET Project reflects needs under the three additional proposals. The Project will implement numerous upgrades in a phased manner and comprehensively link research, education and enterprise-training centers to meet skill needs of enterprises. The DM discussed the combined Integrated Network for Education and Technologies (INET) Project with the State Secretaries and Advisors to the Minister who reconfirmed his commitment to act as sponsor of the recommended USTDA assistance to prepare INET (see Annex II).
- (b) **Development Impact:** Romania's development plans and strategic initiatives of, and commitments to the EU call for expanding education infrastructures. Private sector partners also offer excellent opportunities to deepen ongoing education reforms by connecting markets for new style jobs in modern IT enabled work environments. Using modern networks, university-industry links can raise the relevance of skills imparted and train students effectively for more innovative and productive employment. To sustain such links requires a strategic framework within which they can operate economically and support growth through life-long learning etc. The proposed TA develops this framework to ensure the desired impact of the Project, namely jobs today and growth tomorrow. When completed the Project expects to create at least 20 jobs to manage the networks and another 300 at universities and schools to support expanded curricula over time. At completion of INET, the available pool of graduates with relevant knowledge-economy related skills will be at least fifty percent larger than that today. This will substantially reduce enterprise costs and time to train and hire Romanian graduates, attracting more firms to locate in Romania.
- (c) **Project Sponsor's Capabilities and Commitment:** Public sector implementation of projects has been generally slow and the MoER is no exception. Nevertheless, it remains strongly committed to meeting EU goals. Among others, this was borne out by the renewed vigor with which the State Secretary and President of the National Research Authority responsible for the existing network, endorsed the DM's approach and recommended the Minister reiterate his request for a more comprehensive Project. The DM also received

three additional project concept notes from senior MoER managers, at the heels of an organizational restructuring, to help MoER better respond to pressing market needs for skills and innovation. Therefore, the DM stands assured that private interests driving public-private partnerships (PPPs) in MoER today would offset any laxity in MoER capabilities. The private sector also welcomes output based and results driven contracts to build out and fully exploit the proposed networks.

- (d) Foreign Competition and Market Entry: Even well established U.S. firms face problems in accessing EU funds. This Project enables U.S. industry especially the members of the e-Learning Industry Group to penetrate the rapidly growing EU funded markets for basic infrastructure. The DM considers this as a major technology driven inroad to the Eastern European market for education and education-ware. Given their regional marketing plans, firms such as Oracle can quickly replicate their successes from Romania in neighboring countries.
- (e) U.S. Export Potential: The DM estimates a modest direct potential of U.S. \$50 million from this Project and similar sales potentially repeated every year since private interest in enabling similar networks is poised to take off. The European market is large and replicating success from Romania will result in more 'wins' elsewhere for U.S. firms. Within 2 or 3 years up to five times the exports to Romania can accrue from the region. Further, the expansion prospects for education business look extremely attractive and it is likely that private investors will court U.S. universities for setting up satellite campuses in Eastern Europe. The DM received one such expression for interest from Dr. Varjun Pambuccian, a Member of the Romanian Parliament, and directed him to the U.S. Commercial Attaché.
- (f) Justification: EU strategies as well as market demands, both call for MoER to invest in IT to better link the educated with the new economy. While MoER needs to ensure Romanians graduate with skills needed by enterprises, U.S. IT firms need to anchor their strategic interests by developing successful 'model' partnerships replicable in the region. USTDA assistance will greatly leverage the public-private partnerships of U.S. firms with MoER. This Project, therefore, holds great business promise for U.S. firms and development prospects from private investment led employment in those countries. Since the DM does not foresee financing constraints and that sufficient private sector interest will offset implementation constraints it can justify the Technical Assistance (TA) to prepare the Project. The TA will aim to catalyze both, MoER's and U.S. firms' interests and prepare a comprehensive Project to be rolled out in phases. Public funds are better justified for a well-prepared Project. Moreover, and USTDA assistance would potentially help level the playing field for U.S. firms in relation to European competitors with better levers in using EU funds.
- (g) Qualifications and Terms of Reference (TORs): A strong team possessing academic, human resource and technology expertise will provide Project preparation TA. The TORs focus on ensuring the Project delivers the key development impact – a skilled labor force meeting market demand from jobs and growth in the new economy. The TA Contractor will design learning, teaching, resource management and technology enhancements to strengthen university-industry linkages in line with EU initiatives. The TA Contractor will deliver a phased Project implementation plan with prototype tenders to launch and continue upgrades to existing networks and systems at the schools, university and research centers. The expertise requires an innovative and creative U.S. IT firm to possibly collaborate with an academic institution so that actionable plans can launch network upgrades.
- (h) Recommendation: This DM recommends USTDA support the Minister's request for assistance with a grant of \$366,841 to meet the costs of Technical Assistance at the Ministry of Education and Research to prepare the INET Project so that the Ministry can begin its implementation.

A. PROJECT DESCRIPTION

This section develops a unified Project concept beginning from the initial request of the Ministry regarding the NESDATA and University IT Labs Networks. The Project, as conceived now, integrates needs of University e-governance, pre-university and primary school mobility systems conveyed to the DM during its visit. These proposals called for numerous network upgrades towards a common centralized platform to help MoER comprehensively manage the quality of research, education and training. The DM discussed this integrated Project concept with the State Secretaries and Advisors to the Minister who reconfirmed his commitment in the revised request to sponsor assistance of the USTDA (See Annex II).

The proposed Project -- an Integrated Network for Education and Technology (INET) -- will have three components. The first component, Research-INET (R-INET) will support functions to modernize research and its administration by MoER; the second, University-INET (U-INET) integrates with R-INET to help manage, academic and training functions at the university levels; and a third, School-INET (S-INET) will enable pre-university, secondary and primary level users in schools to access content the INET will carry.

The requests for USTDA assistance

The initial request for assistance was to help modernize the University IT Lab Networks and enable school-goers to use the National Educational System (NES) and e-learning to develop competencies and skills needed at the pre-university stage. The DM also evaluated how best to leverage successes in the ongoing Oracle program with school and university students, with USTDA assistance. The DM also evaluated additional expressions of interest received from senior MoER decision makers for systems to help manage research, university and school level portfolios. Overall, the scope of the requests for assistance all pointed to a cohesive modern network to help MoER manage public education services to meet a dynamic private sector demand for skills and complement the university and school systems. Therefore, the DM viewed the MoER requests for assistance more comprehensively than merely as a networking project. Taking a strategic approach to enhance skills for the new economy the DM assessed functions to streamline and support the delivery of modern educational content at all levels that existing networks would need to support. The Minister confirmed this synergetic approach later in the revised letter addressed to the USTDA (Annex II).

Background

Annex I details background information on Romania's education system, its ongoing reforms and the existing infrastructure. The itemized lists of network enhancements sought in the numerous requests for USTDA assistance do not explicitly prioritize urgent needs of IT firms and other employers in Romania – a significant development target. Nevertheless, the call for action is immediate as firms are setting up their own training centers and MoER recognizes their needs. The DM aimed to structure USTDA assistance to respond to the Minister's request to design a feasible and actionable Project that (a) takes a comprehensive approach; (b) develops a phased implementation plan; (c) prioritizes the tasks that lie ahead of the MoER; and (d) ensures implementation with lasting results. To prioritize what the Project needs to upgrade in the existing networks the DM considered a needs-based approach within a strategic framework – needs of the enterprises to employ and those of the students to find jobs. As Annex I details the education system is undergoing substantive reforms to align with the EU standards.

Therefore, in the view of the DM the Project's framework should be such that it:

- (a) Integrates the Project with EU goals (e.g. Lisbon, Bologna and i2010 agendas);
- (b) Links education and skill development in schools and universities with employment needs based on higher productivity and innovation capabilities of graduates;
- (c) improves access to education such that jobs and economy can grow based on advanced IT enabled skills acquired quickly on demand along with traditional education at universities and schools.

Demands of the EU market: New skills

The next step in meeting EU's Lisbon Agenda requires member Governments to raise R&D expenditures and labor-force participation rates, both functions of the quality of human capital. Therefore, education and skills are becoming increasingly important areas of emphasis in the EU strategic framework. A recent re-examination¹ for EU concluded that the vast majority of jobs created from 1995 to 2005 were in knowledge-based services accounting for 35 per cent of total employment across the fifteen major EU members. Technology based manufacturing contributed fewer than 7 per cent of employment with high tech manufacturing accounting for just over 1 per cent of total employment. Among the knowledge-based services, education, health, recreational and cultural services in the public sector and high-tech, financial, business and communications services in the private sector added 13.3 million jobs. This is in stark contrast to all other areas that had a net contribution of only 5.3 million jobs added between 1995 and 2005. Another analysis suggests that unless EU members jointly commit to link education and training with productivity and innovation in a fiscally sustainable manner, EU cannot compete with annual increases in global workforce e.g. China's planned 100 world-class universities, 600,000 Indian engineers etc.. This requires EU members to make underpinning investments in R&D, IT software and hardware to make higher education more relevant². The proposed Project aims to strengthen the operational linkages of the existing IT labs in schools and universities with research and enterprise training centers and further Romania's contribution towards the EU agenda.

The EU's Lisbon Agenda to create growth and boost innovation and training has already had some impact in making Europe more competitive. Past investments, as those in Romania, have given the European workforce a good level of basic ICT skills and the traditional education systems prepare graduates for white-collar work. Many have built on their traditional skills adding basic IT skills to use software and database applications that expedite transactions in an enterprise. A growing number have acquired a somewhat higher technology based skill set. With formal or vocational training in database administration, communications, hardware and software systems etc., they staff numerous U.S. and European IT firms.

As skills in basic IT use and technologies become an increasingly important entry ticket to the job market, future demand for IT skills is expected to reach beyond such skills to more advanced e-business and IT enabled operational skills. These are becoming increasingly crucial for global competitiveness, innovation and growth.

In knowledge-based service sector, where the highest job growth is, employers require more IT enabled operational skills. Knowledge industry workers undertake what economists call "interactions" or the searching, coordinating or monitoring required for exchanging goods and services globally³. The relevant skills and competencies require using IT to view the world as one homogenous and networked marketplace to organize supply chains or logistics in. Knowledge workers need to interact much more, using e-mails, the web, and new technologies that have broadly begun to shift the nature of economic activity. The relevant IT enabled operational skills are also those most relevant for integrating R&D with innovation and productivity.

Although IT enabled operational skills are key to competitiveness, innovation and growth the lack of time and money are major hurdles for firms in hiring new employees with these critical skills. Increasingly, they are relying on the individuals to pick up these skills on their own and only few make use of more flexible delivery solutions such as e-learning to remedy the situation. Exploiting IT better by linking schools and universities with enterprise training arrangements can help build needed skills earlier and save time and money for firms to staff globally responsive operations. Strengthening capabilities of the existing IT networks for better use by students to interact with enterprise training programs will enable them to embed technology, user and operational / e-business skills as core competencies prior to graduation. In supplementing their other academic training, students can develop the needed aptitude for using IT to interact and innovate globally. This will considerably raise the productivity and labor-force participation rates in Romania, save time and money of firms in finding and hiring students and attract more such firms to locate in Romania and contribute to overall economic growth.

¹ Brinkley, I. & Lee, N. "The Knowledge Economy in Europe-A Report Prepared for the 2007 EU Spring Council". The Work Foundation, October 2006, pg 23.

² Ann Mettler, "The Missing Link: EU's job strategy will not get very far without better education" WSJ, March 8, 2007.

³ Johnson, Bradford C., Manyika, James M. and Yee, Lareina A., "The Next Revolution in Interactions", McKinsey Quarterly, 2005, Number 4.

Recent developments: The private sector

In the absence of such networked arrangements, IT firms are leading the investments in Romania to address the skills market needs. Increasingly attracted by large pools of qualified Romanian youth, they have begun training them in new processes and techniques for productive employment. The successful programs for primary through PhD students by Oracle and ongoing vocational training by Cisco are delivering on market needs today. The opening of Microsoft's Global Technical Support Center expects to draw on the existing pool of technically skilled IT technology professionals for some one hundred staff and help create some 8,000 jobs for those acquiring IT user skills in the newly unveiled Microsoft Vista suite. Following the U.S. IT firms, European technology firms, Siemens, Schlumberger and Infineon are also setting up training centers near university campuses. As per Romania's national development plans, their private sector initiatives testify to the increasingly business friendly environment but relevant education and skills for a knowledge-based economy, the essential pre-conditions, are still lacking. Some firms are now collaborating with MoER to address that too.

Oracle, since establishing its presence in Romania in 1996, has become a strategic technology and applications supplier to the government. It plans to collaborate more effectively with other neighboring governments, building on its success as a partner of the Romanian public sector (see Section F). Its service and technology center in Bucharest employs 350 specialists and trains 8,000 students through its Academic Initiative. Oracle is sponsoring five PhD students at the Polytechnic University of Bucharest and its trainees win top honors at its annual Global Data Modeling Contest in UCLA. It extended its investments in education by launching Think.com, an online learning community for primary and secondary students; and an Internship Program for senior undergraduates and master's students. Think.com provides users with protected e-mail accounts, personal web pages where they publish text and upload images in a collaborative environment for group discussions and projects used by thousands of schools in more than 26 countries in eight languages.

Cisco, which has a long standing MOU with the MoER provides electronic courses through its Network Academy portal and free updates to teachers and students in their Network Academy programs. It trains trainers to use online assessment systems and blended distance learning sessions with access to Pearson VUE (Virtual University Enterprises) and Thompson Prometric Assessment Centers -- the two leading international learning solution providers. It has successfully offered professional and technical qualifying courses as part of mandatory curricula of XI grade and XII grades in secondary, technical and post-secondary schools.

Networking needs & other initiatives

The ongoing IT and e-Government initiatives have made significant outlays (Annex I) for enabling access to education and administrative resources. Programs like NES, SEI, Knowledge Economy Project and the ongoing public private partnerships focus on populating the basic infrastructure with content, increasing its access and integrating the education system for the rural underserved. Towards this, there has been substantial progress. Nevertheless, as MoER moves towards EU's goals of the Lisbon and Bologna processes, it is the graduates i.e., those that already have knowledge who need additional skills to interact in the global environment that need to be served.

MoER needs to help Romanian graduates acquire skills that help them innovate and make their employers more competitive.. This effort requires helping employers draw on innovation and R&D outputs from research centers, and on more skilled university graduates, and in turn, ensure basic aptitudes and skills of university entrants developed in schools are also encouraged through lifelong learning later. Curricula and content at all levels need to evolve dynamically in digital formats for distance-, mobile- and e-learning employing virtual campuses and the public. Students need to access modern networks with applications and facilities already equipped to impart the new literacy. University and school labs lack modern arrangements to host e-learning for tomorrow's employers but only some universities require equipment, most lack good connectivity (e.g. wireless broadband). Larger campuses can better serve major employers like Siemens, Solectron, Infineon and Alcatel who are already setting up their own training equipment at campuses in Bucharest, Brasov, Timisoara and Piteste. Therefore, MoER can anticipate the needs of firms and develop networks in large population centers first to attract private sector by reducing their IT infrastructure set up costs. Firms would then require only physical

resource-sharing arrangements to offer modern curricula at university IT labs and MoER could manage potential research better using university-industry linked networks.

The regulatory and economic incentives can also be made more business friendly for private firms to invest at university campuses. Typically, by using an MOU as the basic arrangement for public-private partnership with MoER, infrastructure sharing agreements can allow firms to use excess capacity of the Romanian Education Network (or RoEduNet, the Government backbone, see Annex D), i.e. the MOU could enable it to be leased, rented or bought by private firms. Universities can then use broader bandwidth to connect with European and U.S. education providers and deliver more accredited content according to Bologna standards. Such steps would foster private sector interest to continue upgrading IT platforms as and when their content requirements change in future. A dynamically evolving network could also be more fiscally sustainable for MoER under such a comprehensive framework. Linking innovation and productivity needs of potential employers with network users on campuses requires pro-actively conveying employment and research demands to faculty, researchers and students. MoER can better justify the budgetary use of EU structural funds, especially those for universities to service more research needs, and a priori, justify more financial support from these funds.

The DM incorporated the interest for a University e-Gov network to help manage performance-based allocation of Government funds to universities, and the international mobility of students and linkages with pre-university programs. These call for integrating the administration of university and research systems, learning and content management systems as well as secondary and primary education systems using a comprehensive network-upgrading plan. Combining these expressions of interest into one project has the advantage of streamlined support sponsored by USTDA. As the next section on Development Impact demonstrates, the project concept (below) addresses the four critical pillars for any country to participate fully in the knowledge economy:

- **Education & Training:** Educated and skilled populations adept at using modern networks to share create and use knowledge, which many regard as a single national infrastructure at times.
- **Information Infrastructure:** A dynamic information infrastructure is required to facilitate the effective communication, dissemination and processing of information. The Project upgrades the existing networks (Annex I) to enable the educated to exploit them better.
- **Economic Incentive & Institutional Regime:** A regulatory and economic environment that enables the free flow of knowledge (on-demand and for lifelong learning), supports investment in ICT and encourages entrepreneurship is central to the knowledge economy. The Project will further enable PPPs towards this.
- **Innovation Systems:** A network of research centers, universities, think tanks, private enterprises and community groups is necessary to tap into the growing stock of global knowledge, assimilate and adapt it to local needs, and create new knowledge. Eventually university-industry linkages will enhance the development impact towards this pillar.

The Project:

The Project will re-equip existing education and research networks with modern functionalities to enable e-learning and sharing of know how with knowledge-based enterprises. As the Integrated Network for Education and Technology (INET) it will enable research centers, universities and schools to better prepare users with skills needed to compete in the knowledge economy. Its three components reflect the primary needs of three user groups. The MoER and research bodies will manage links between education, research and the economy; universities will network the IT labs serving higher education users; and secondary and primary schools will integrate and share resources with it under the ongoing NES project.

The Project will implement:

(a) A Research INET (R-INET) will create the University e-Governance Network for MoER and national academic and research bodies to manage resources for innovation and research at universities and schools. An integrated resource monitoring and management information system, R-INET will link the MoER with their databases to ensure continuing relevance of research programs to the rest of the economy. The system will help balance public investments with competitiveness enhancing results to raise productivity, create jobs and growth. The performance-based allocation of funds for research will also bring more transparency in the system.

(b) A University INET (U-INET) will upgrade functions of the existing IT Labs and network them under a centrally managed system. This will enable universities to access each other's faculty resources and administer a cohesive set of national programs. Managers of higher education will be able to coordinate and interchange organizational and academic information while students and their potential employers can interchange technology and innovation related information. This network will serve as a platform for inter-university collaboration at national and international levels.

(c) A Schools INET (S-INET) will upgrade functions of the ongoing NES Data Network project and integrate primary, secondary and pre-university skill development requirements. It will cover all schools (primary and secondary), targeting all pupils and their access to libraries and knowledge resource centers nation wide. It will also strengthen NES functions serving county inspectorates and offices of MoER to coordinate the quality delivery of the national education curriculum and facilitate knowledge sharing.

MoER and the National Agency for Qualifications in Higher Education and Partnership with Social and Economic Environment (ACPART) have preliminarily identified functionalities required under the above three components. The Ministry also has preliminary details of systems needed to support the cross-border mobility of students and administer educational program resources.

The Terms of Reference for the proposed Technical Assistance (TA) requires the TA Contractor to prepare the Project by developing a feasible implementation plan to re-equip and upgrade the existing networks in a timely, technically efficient and market responsive manner. The TA Contractor shall:

- (a) Develop a strategic framework of jobs, growth and competitive skills needed based on EU and Romanian development plans and strategies. This will allow staging the upgrades needed in the short, medium and long term for different education centers responding to market needs and availability of funds.
- (b) Assess the quantum and nature of skills necessary and capabilities of universities and schools to meet them with existing facilities and proposed private sector programs. This will help set skill and employment targets to design curricula and systems support for it.
- (c) Help Romanian decision-makers assess how best to meet these needs using competitive U.S. learning and training content, systems and technologies.
- (d) Prepare a feasible implementation plan detailing actions to take by each education center or private partner supported by MoER.
- (e) Develop tenders for contracting out delivery of technology and systems upgrades to support skill development.
- (f) Develop a system using which the progress and impact of the staged network can be monitored and additional funding be raised to implement future stages.

B. DEVELOPMENT IMPACT

Among EU members, Romania's innovation infrastructure is relatively immature, lagging behind most and paralleling only that of Cyprus⁴. The key innovation drivers – number of science, engineering and tertiary graduates, broadband penetration, participants in life-long learning, youth education attainment etc. will all increase if this project is successful. As it modernizes and activates linkages between universities, research centers and enterprises it will allow a freer flow of purpose driven knowledge as demanded by employers and their ICT users. Enterprises recognize these abilities as essential to making their business cases more viable in emerging knowledge economies. Therefore, the use of the network will raise abilities, competencies and employment in high-tech services, exports of high tech products, sales of new products to new markets and new firms etc. Overall, employment and growth will rise over time with better networked infrastructure.

The MoER expects its trained labor force to benefit from not only knowledge economy skills but also from lifelong learning and professional development facilitated by integrating the networks. U.S. IT firms estimate a 50 percent increase in graduates employable in the knowledge industry with such a platform completed under the Project. The proportion of Romanian workers with tertiary level training especially in science and technology also needs to be quickly raised from about 5 out of 1000 population between the ages 20-29 to the EU average of 10. If firms also start to use networks to reduce set up costs to train Romanians across college campuses, once equipped and connected to Europe, on-line courses available in Belgium, German, Italy and neighboring Hungary can help raise this proportion significantly for Romania. Similarly, researchers and non-IT industry workers can share expertise, enhance innovation and increase productivity by networking across Europe to develop IT enabled operational skills for competing in the global economy.

The DM estimates that just to upgrade the networks and implement the project will create upwards of 20 full time jobs. It also estimates creating one permanent job to provide a combination of network, academic and administrative support for every three or four education centers when fully networked. For seventy universities this implies another 20 jobs and for some 1300 schools, upwards of 300 jobs. Once operational, it is expected that some 50 percent more among those graduating will have skills relevant for direct employment in IT services (as needed by Cisco, Oracle and Microsoft today) and then for high-tech enterprises (as needed by Schlumberger, Renault, Infineon and Solectron). This Project would considerably reduce the set up costs for foreign firms that would take less time to train and hire competitively skilled Romanians.

Romania has committed to gradually reaching income, competitiveness and living standards of EU as a new member. However, even with robust economic growth recently, its labor participation and employment remains well below the EU average as 40 percent of its population is rural where human capital development remains limited due to lack of access to ICT. Initiatives like the World Bank's Knowledge Economy project will enable better access and more digitized content to the knowledge-disadvantaged. Nevertheless, the proposed INET Project will better network the knowledge-endowed population at education and research centers of Romania with EU enterprises, innovation and education centers. As its education-market opens up and reforms, it can attract significant investor interest for industry-sponsored research. This will help contribute towards the EU target of 600,000 researchers by 2010 as Romania's pool of over 75,000 graduate and postgraduate students begin taking advantage.

The development objectives and project strategy

The EU in its Lisbon and i2010 Agendas, as well as Romania's national development plan all emphasize networking education for innovation. Therefore, the key next step is to invest in well-functioning modern ICT networks guided by policies that link skill and work force demands of knowledge economy to the centers of education and research. Therefore, this Project supports those initiatives of the Government that aim to develop a competitive workforce equipped with a new literacy.

⁴ See "European Innovation Scoreboard 2006: Comparative Analysis of Innovation Performance", Maastricht Economic Research Institute on Innovation and Technology (MERIT) and the Joint Research Centre (Institute for the Protection and Security of the Citizen) of the European Commission, 2006.

Recent work by the Ministry of Economy and Trade (MoET) has also identified three priority areas for increasing Romania's competitiveness – innovation, R&D and ICT use. The MoET document "Sector Operational Program: Increase of Economic Competitiveness" gives detailed targets and data on what results need to be achieved with ICT developments. The Scope of Work for TA recommended by this DM requires a detailed evaluation of how the proposed networking will address these targets.

A strategic framework will ensure results from using networks generate the desired development impacts, as follows:

- (a) *In the short term, maximize jobs and employment prospects* -- reduce the unmet skill needs of the private sector firms, by increasing the number of trained graduates with new skills and competencies, their additional time to train, the costs of training and the setting up facilities at universities etc.
- (b) *In the medium term, maximize education and skills* -- increase the users of revamped e-learning facilities taking advantage of education on demand, lifelong learning, interactive global learning and enterprise driven training;
- (c) *In the long term, maximize links of education and skills through innovation with productivity and growth in enterprises* --- create a PPP driven legal, institutional and economic incentives environment that enables resources shared productively to leverage education for economic growth and competitiveness. Balanced public investments and well-managed PPPs can effectively raise the quality, relevance and reduce cost of education by using INET.

A key element is the enabling environment for market reforms to allow infrastructure sharing and interconnection with the RoEduNet education network backbone. Strengthening alliances can help MoER achieve its policy and development objectives with the private sector as a collaborator in delivering services. This business friendly approach will also help to promote efficiency and innovation, increase accountability for performance and lever public resources with private financing⁵.

Initiatives that open the market, after education reforms, will increase private sector involvement in education. There is a range of possibilities depending on varying degrees of private sector participation if MoER initiates investments in modern infrastructure. Specific areas with the greatest investment potential include: (a) branches of foreign universities (b) enterprise training programs; (c) quality distance education and e-learning programs; (d) career counseling; (e) training of trainers; etc.

As enterprises, education and training-providers increase sharing infrastructure or network hubs, solutions to reduce the skill gap will continue to emerge as the dynamic demand for skills changes. They can jointly refocus education and training as technology and training tools call for newer standards and quality certifications etc. Modern science and technology parks can emerge around the more vibrant university campuses linked by evolving networks to house and anchor skills and innovation programs that help more competitively integrate enterprise production and logistics into global supply chains.

⁵ One very useful resource for policy-makers is using output based contracting wherein, for example, the networking of three pre-designated education centers to meet the needs of 3 private firms, as specified by them, can be bid based on short term results and milestone driven Service Level Agreements (SLAs). This would be extremely useful for physical facilities required to be re-furbished by IT/e-learning components of the project, covered by this DM, but an essential need to accompany network modernizations planned.

C. PROJECT SPONSOR'S CAPABILITIES AND COMMITMENT

The DM assesses the Ministry's commitment as strong and encouraging but its implementation capabilities as weak. This is the single detractor that its recommendations have been developed to mitigate.

MoER's strong commitment derives from national commitments to the EU to expand ICT use for developing a competitive and innovative work force. Towards that, the Government has already invested upwards of \$600 million for ICT in schools and universities during the last ten years. The EU has committed approximately 330 million Euros for ICT among addition structural funds. Through the World Bank Knowledge & Economy project, the Government is investing \$70 million to ensure access to the knowledge-underserved population. MoER, on the other hand, driven by its success with the Oracle programs now wishes to take a step forward and serve the more educated to better link with the European economy.

As discussed and agreed with the State Secretary, Mr. Miron and the President of the National Authority of Scientific Research, Dr. Anton, this project will comprehensively address the needs of the educated lacking skills to interact with the market to enhance innovation and productivity. This will help implement the Government's IMPACT plan to directly link research, infrastructure and the economy and boost competitiveness. This agenda, along with the RoEduNet backbone network is Dr. Anton's official responsibility. Their understandings of the project, and those of the Directors-General for Higher Education (Mr. Constantinescu) and Schools, Dr. Dumitrache (Chairman, University Consortium) and Professor Sorin Zaharia (Head of ACPART, the lead national agency for managing university linkages with the economy) who authored the initial project concept were also discussed in detail. The DM shared the draft terms of reference for the proposed TA with them and comments including those of industry partners in this DM report (Section K). Romanian firms and public representatives as well as IBM, HP, Cisco, Microsoft together with Oracle helped the DM validate and confirm MoER's commitment and the reasonableness of implementing the INET project as proposed.

Recently there has been reorganization in MoER. Fortunately, guided by U.S. Senior Commercial Specialist, Ms. Brancusi, the DM discussed and reached agreements with new managers representing the Minister on travel. The DM discussed and explained the need for an Advisory Group to coordinate the TA Contractor's work with the Ministry, and other arrangements to manage the Project preparation of the networks. The requirement that the Minister sponsor the Grant Agreement, if DM recommendations are accepted by the USTDA, were clarified to all and a letter forwarded by the U.S. Commercial Service, signed by the Minister upon his return, confirms these understandings (Annex II).

However, the DM views the major weakness to be in the area of public sector implementation of projects in Romania. The Knowledge and Economy project is moving slowly; education reforms are not keeping pace with market demands; and Universities granted autonomy still have funds lying unused. Nevertheless, private training centers are booming and the Ministry is increasingly relying on private firms to cooperate and solve implementation issues through MOUs. This is an important reason to ensure collaborative PPP style designs of the proposed network upgrades along the lines of the successful Cisco and Oracle partnerships are developed. Their continued success in spite of a few restructurings of the Ministry assures the DM that implementation of the Project could be driven and even ensured by U.S. suppliers' market interests given result oriented and actionable plans.

The DM holds the view that U.S. firms implementing proactive MOUs, better justifying budgetary expenditures and using EU funds, could offset implementation weaknesses of the Ministry. This new style education and learning could also spearhead the U.S. e-education industry footprint in Eastern Europe.

The DM recognized substantive interest in private provision of education as partners of U.S. education and training institutions. Given the Ministry's commitment to work with private partners, interest in new style learning, potential of U.S. firms to replicate business wins from Romania and elsewhere in the region, the DM views that a fast track, proactive, results oriented network upgrades could be designed and easily implemented.

D. IMPLEMENTATION FINANCING

According to the World Bank's assessment, the Government routinely bases its budget on optimistic revenue projections but underestimates expenditures. On the other hand, the budget for 2007 allocates 9.7 percent of GDP for fixed investments (compared with actual 3.8 percent in 2005 and expected 6.1 percent in 2006), which are likely to remain unspent and be reallocated to spending during the course of the next year. The Ministry of Education faces the challenge of justifying the requests for available funds.

In addition, Romania is preparing to use EU structural funds in its national development plan for 2007-2013. Its operational programs need to reflect the EU priorities and Lisbon objectives (sustainable growth, competitiveness and employment) as guidelines for using the structural funds. These are: (i) make Europe and its regions more attractive places to invest and work; (ii) improve knowledge and innovation for growth; and (iii) create more and better jobs.⁶ The current tranche of structural funds is an estimated 20 billion Euros of which some 2.6 billion Euros are for supporting efforts to build competitiveness. EU has earmarked some 330 million Euros for Romania's ICT projects separately. The Minister of Communications and Information Technology recently defined ICT priorities for the grants: supporting access and use (30 percent) public service development and efficiency (40 percent) and e-business developments (30 percent). Public sector ICT projects can apply to use the funds now for disbursements in late 2007 or early 2008. He emphasized the funds need to boost market competition, decrease bureaucracy and serve the economy – goals that MoER wishes to enable its universities and researchers to meet.

As advised by the State Secretary Mr. Miron and the National Research Advisor Dr. Anton, the DM has ensured that the impact they envisioned sets the target for which the proposed TA will plan what is most feasible, least bureaucratic and easily justifiable for implementing quickly under the EU framework. The proposed phased upgrading will enable decision makers allocating Romania's budget and EU funds to justify their timely, market driven and results oriented use. The TA Contractor will initially develop the strategic framework and broad investment estimates to allow the MoER to place an initial budgetary request. After identifying actual systems needed, phased investment requirements of short, medium and long-term upgrades for each of the three components can be requested through EU, Government and or individual university budgets.

While the available financing poses no constraint on the project, resource-sharing arrangements and potential foreign direct investor actions, given the real prospects for market reforms, would only enhance this availability.

E. FOREIGN COMPETITION AND MARKET ENTRY

U.S. firms are well established and actively collaborating with the public sector, especially the MoER, of late. However, the availability of EU funds benefits competing European firms more. Even though the funds can legally finance U.S. product, established U.S. firms in Romania find that extremely difficult to manage. SAP and Siemens regularly win business away from Oracle and IBM. Even after discarding the line of non-U.S. content

⁶ Around one-third of the European Union's (EU) budget is spent on developing the environmental, transport, tourism, medical, and information and communication technology infrastructure in the less developed areas of its 25 Member States. Grants (from the Structural and Cohesion funds) and loans (from the European Investment Bank) are the main instruments used to further the EU's economic development policy. U.S. companies can better understand the process by which projects are funded and financed in Europe from details are provided in the International Marketing Insight (IMI) Report M32 (http://www.buyusa.gov/europeanunion/summary_three_two.html) Although this IMI addresses opportunities in the 10 new EU member states of Central and Eastern Europe, information throughout the entire EU. A key element in the European Union's efforts to become the most dynamic knowledge based economy in the world by 2010 is its eEurope initiative. Another IMI report (MR-7) highlights the funding and financing possibilities available from EU and EIB providing concrete examples of how those funds have been deployed (http://www.buyusa.gov/europeanunion/summary_zero_seven.html)

PCs from its business, and focusing on high-end U.S. manufactured servers, IBM faces stiff competition from French Bull, S.A. -- Bull targets public, banking, financial and industry sector clients and has considerable influence on their access to EU funds as its strategic partners. Bull's Nova Scale and GCOS mainframes expect to compete well with IBM business for the education networks proposed in the project.

The DM recommendations embedded in the Scope of Work for the proposed TA enable U.S. firms to compete more actively for EU funds. First, the phasing of three network upgrades over time will segment the market prospects based on dynamics of content supported by potential equipment sales. Next, so that U.S. firms, particularly members of the European e-Learning Industry Group (www.elig.org) can better access EU funds along with their European partners requires using open systems designs. In furthering the open standards recommendations of the e-Learning Industry Group, the planned network designs will also ensure a level playing field for technical competition and collaboration among U.S. and European suppliers. Finally, the DM anticipates that an Orientation Visit to major U.S. education and research centers will follow the recommended TA to help U.S. providers of content, education-ware and integrated systems exhibit value propositions for Romania to help garner additional regional opportunities (see Section F).

U.S. firms, especially those collaborating with MoER benefit from this Project because: (a) it supports their regional plans for expanding markets and operations; (b) integrated solutions used in U.S. universities can be introduced more effectively and competitively; and (c) their established footprint with successful training in Romania can be expanded throughout Eastern Europe rather quickly as Oracle anticipates.

F. U.S. EXPORT POTENTIAL

The past levels of expenditures in ICT for the education sector indicate that \$100-200 million will be available annually to upgrade networks. Given EU imperatives to invest towards innovation and productivity generating enhancements it is reasonable to expect that Romania, at a minimum, will continue this level of investment – opening a sustained market of about \$150 million per year during the 2007-13 plan period.

The DM estimates that some 30-40 percent of the planned IT expenditures are for hardware, half of which could originate as U.S. export from suppliers like Cisco and IBM supplying essentials for the transmission and network layers over the existing physical infrastructure of the RoEduNet or the Internet. In addition key enterprise software and hardware supplied by Sun Microsystems and Oracle could claim approximately 20 percent share of the education network expenditures. In total, the DM estimates 40 percent of the anticipated \$120 million, the estimated cost of the three network upgrades, will accrue to U.S. sourced exports – that is, some \$50 million in related sales. In addition, the market reputation of a successful project spearheaded by a U.S. firm such as Oracle could attract regional sales in upwards of 5-10 countries. So, the long term prospects of emulating Romania's success in Moldova, Ukraine, Hungary and elsewhere raises this conservatively estimated prospect of U.S. sourced exports to upwards of \$250 million in a European market estimated to be upwards of \$1 billion annually. In addition, there is a significant spin-off PPP-driven market prospect for U.S. sourced exports that the DM foresees but cannot estimate at this stage.

G. IMPACT ON ENVIRONMENT

The proposed TA and the Project do not anticipate any direct construction or refurbishment of facilities or furnishings. The primary emphasis is to modernize the networking environment that is the electronic capability set of the existing IT infrastructure to enable more functions from its use. Under the three components of the Project capacity or connectivity enhancing equipment such as servers, routers and wireless equipment may add to or re-configure existing equipment at hubs serving networking at IT labs of schools, universities and research centers. This will not have any negative or positive environmental impact.

Nevertheless, enhanced network capabilities may attract private firms to enter into MOUs with MoER to link their modern training facilities with, or upgrade facilities at the IT labs or newer spaces available within school and university buildings. This will only have a positive impact and that too on the “occupational” environment that is within the buildings, since no additional building construction etc. will be planned envisaged under the Project.

Therefore, the DM does not foresee any direct negative impact on the environment due to the implementation of the Project as conceived.

H. IMPACT ON U.S. LABOR

The recommended Technical Assistance and the Project will both result in opportunities for the supply of U.S. equipment, and services. This TA complies with the Foreign Operations, Export Financing and Related Programs Appropriations Act restricting foreign assistance. The TA does not provide incentives to any enterprise currently located in the United States to induce it to relocate outside the United States such that it may reduce the number of employees of such enterprise in the U.S. because its U.S. value addition is replaced by such enterprise outside the United States.

On the contrary, it creates additional markets for value created in the U.S. The prospects of increased exports of goods and services from U.S. manufactures of intelligent networking equipment, educational content, and business service organizations is expected to have positive impact on the use of U.S. labor. Over the long term, U.S. educational institutions, e-learning services providers, telecommunications, computing, software, publishing and media enterprises will expand business and win contracts in newer neighboring markets that result in increasing their U.S. value addition. This will sustain the positive impact on U.S. labor anticipated by the TA and the Project in Romania as newer markets are penetrated.

I. JUSTIFICATION

Developments in Romania’s IT and e-learning sector can begin influencing broader Eastern European knowledge economy needs in the long term. The surging interest and pro-active cooperation with industry, recently led by Oracle, can be quickly replicated in the region as a successful PPP model. Practical steps taken under this Project can provide the right incentives to provide training reflecting market needs for a global economy. Designing a framework for actions to be feasibly implemented, phased to suit needs of institutes undertaking academic reforms and firms competing in the dynamic economy can help both. The same firms can use the model in neighboring countries, further along or following EU membership paths.

Romania's entry into the EU, rising demand for its skilled labor, educational reforms and foreign investments tapping its educated work force call for strategic planning today. Instead of assessing feasibility, by appraising cost-benefits of infrastructure deployments the DM recommends designing feasible networking solutions within a development framework. This should help meet EU targets, avoid obsolescence due to rapidly emerging technologies, respond to private sector needs and draw upon recent successful experiences with U.S. firms. It recommends a results-oriented approach to link education and industry and further lifelong learning. Not only in Romania where Oracle is well poised, but as it plans, in all Eastern Europe where competitive advantages of U.S. education can support export sales of U.S. IT firms.

In turn, this is expected to drive the growth in U.S. sourced training, educational franchises, certifications, diplomas and degree offerings. To help plan for EU targets to compete with China setting up a hundred excellent universities this project has the potential to initiate a trend in Eastern Europe to help U.S. universities do just that for Europe on a larger scale. The annual e-learning market potential in Europe is an estimated \$1 billion and its development impact is huge – 600,000 researchers with internationally competitive skills as one example – and planned financing is an estimated 3 percent of Europe's public sector budgets.

The DM assesses the market potential as high, especially as firms plan to replicate Romanian successes in Eastern Europe. Its recommendation for technical assistance to implement Romania's development agenda is based on the potential to expand the trade agenda for the U.S. e-learning and IT industry in the region.

J. QUALIFICATIONS

This Technical Assistance requires a broad range of expertise to define skill needs, identify networks parameters, and design and configure the networks to carry the content and academic interchange required by Romanian researchers, university and schools students. Evaluation for selecting the firm to carry out the Technical Assistance will use the following criteria:

1. Knowledge and experience of the firm in advising academic institutions in implementing e-learning and modern teaching methods and best practices to link innovation, R&D driven academic environments with operational skills needed by global knowledge based enterprises. Expertise in operating e-learning, distance learning, content management technologies, application suites and operating systems to address training needs in globally recognized competencies will be critical. Experience with implementing programs and systems for online student, faculty and course administration is equally important as that in designing network and systems configurations to meet rapidly changing content delivery requirements. The U.S. firm or consortia should ideally have a good balance of strong IT infrastructure design and configuration expertise coupled with academic and human resource development using e-learning techniques. Experience in Europe, especially in programs financed by the European Union would be advantageous, as would be similar experience in Romania or partnerships with Romanian academic institutions. (25 Points)
2. Experience and capability of the firm in advising national academic and economic policy makers on strategies to make education relevant for innovation and national competitiveness. Experience with programs such as the American Competitiveness Initiative or the Lisbon Agenda and related knowledge-based industrial employment generating strategies pursued by EU members will be critical. Experience in assessing efficacy of introducing e-learning techniques for professional training, continuing education and lifelong learning arrangements extending innovation and research to knowledge based will be an asset. (20 points)
3. Experience and capabilities of the firm in advising on national human resource development strategies and or managing skill development programs for major corporations operating globally. Expertise in

evaluating e-learning, distance learning or other ICT enabled techniques to create needed competencies nationally will be critical. Experience in national human resource planning engagements or staffing efforts of major U.S. or European firms competing globally will be relevant. Experience in profiling and advising on overall competency and skill developments will be desirable and that for knowledge industries, especially in the Eastern European region will be preferred. (20 Points)

4. Experience and capabilities of the firm designing, planning and implementing optimized and integrated networking solutions especially for e-learning. Expertise in ADL/SCORM compatible Learning and Content Management Systems prevalent in U.S. and Europe as well as emerging open standards and intelligent networking applications will be critical. Experience in enterprise networking solutions for global knowledge-based industry clients and or managing network operations of a large university system will be preferred. Expertise in contracting through Service Level Agreements to manage existing systems and implement new systems without interruptions will be essential. Experience in evaluating new technologies and network architectures (solutions) to determine if they contribute to network optimization will be an asset. Systems integration experience in networking for e-learning for major U.S. IT firms at their training centers in Europe will be preferred. (20 points)
5. Expertise in project and acquisitions planning for major network upgrades at a national level. Project appraisal and planning experience in academic, training or skill development projects involving new technologies will be critical. Expertise with international project procurement planning and development of tenders to meet financier requirements is also required, preferably for public-private partnerships and results oriented contracting. Experience in working with EU or with Romanian projects will also be preferred. (15 Points)

K. TERMS OF REFERENCE

Technical Assistance

For Preparing

The Integrated Network for Education and Technology (INET) Project

Introduction

The U.S. Trade and Development Agency (USTDA) is assisting Romania's Ministry of Education and Research (MoER) to prepare a Project to enhance the information networking of its education system. The Project will implement Romania's strategy to meet jobs and economic growth targets of the Lisbon Agenda by addressing limitations in the existing ICT infrastructure and strengthening academic and knowledge sharing arrangements. As international firms increase their operations in Romania they increasingly need to work universities to develop skills needed for their IT enabled and technology based operations. A broader access to enterprise and academic knowledge sharing networks can even render school and university level skills in traditional subjects (e.g. science, engineering and medicine) as more relevant for these enterprises to compete better globally. Accessing e-learning arrangements on-demand allows a process of life-long learning to start from primary schools through universities and thereafter. It generates creative and innovative competencies early among school leavers and graduates, who, after employment, can continue adult professional education to help sustain competitiveness of their employers in the long term.

This Project takes a step towards implementing the Government's competitiveness strategy⁷ by planning enhancements needed to existing networks to increase the sharing of knowledge resources. Once research and education centers improve their digital links they can jointly impart skills needed for the "new economy" using e-learning arrangements with enterprises to further innovation and competitiveness. Already surging demand for such skills has encouraged major IT firms to set up training centers and MoER now wishes to extend support, in a Public-Private Partnership arrangement, by providing for a modern capable IT infrastructure to enable a comprehensive digital e-learning and innovation environment to serve Romanian and EU users. This would also complement Romania's ongoing education reforms and curricula development under the Bologna Process and help MoER manage its delivery, especially to meet the dynamically changing skills needed by employers. As more firms start their training centers, the enhanced network functionalities will help reduce the time taken to set up, train and hire skilled and innovative Romanians, benefiting them all.

These terms of reference are for Technical Assistance to help MoER appraise and prepare the Project to modernize the digital infrastructure so it can support functions that facilitate e-learning and knowledge sharing over three networks linking research centers, universities and schools with their administration and enterprises.

The Project

The Project will re-equip existing education and research networks with modern functionalities to enable e-learning and sharing of know how with knowledge-based enterprises. As the Integrated Network for Education and Technology (INET), it will enable research centers, universities and schools to better prepare users with skills needed to compete in the knowledge economy. Its three components reflect the primary needs of three user groups. The MoER and research bodies will manage links between education, research and the economy; universities will network the IT labs serving higher education users; and secondary and primary will integrate and share resources with it under the ongoing NES project.

The Project will implement:

(a) A Research INET (R-INET) will create the University e-Governance Network for MoER and national academic and research bodies to manage resources for innovation and research at universities and schools. An integrated resource monitoring and management information system, it will link the MoER with their databases to ensure continuing relevance of their programs to the rest of the economy. The system will help balance public investments with competitiveness enhancing results to raise productivity, create jobs and growth. The performance-based allocation of funds for research will also bring more transparency in the system.

(b) A University INET (U-INET) will upgrade functions of the existing IT Labs and network them under a centrally managed system. This will enable universities to access each other's faculty resources and administer a cohesive set of national programs. Managers of higher education will be able to coordinate and interchange organizational and academic information while students and their potential employers can interchange technology and innovation related information. This network will serve as a platform for inter-university collaboration at national and international levels.

(c) A Schools INET (S-INET) will upgrade functions of the ongoing NES Data Network project and integrate primary, secondary and pre-university skill development requirements. It will cover all schools (primary and secondary), targeting all pupils and their access to libraries and knowledge resource centers nation wide. It will also strengthen NES functions serving county inspectorates and offices of MoER to coordinate the quality delivery of the national education curriculum and facilitate knowledge sharing.

MoER and the National Agency for Qualifications in Higher Education and Partnership with Social and Economic Environment (ACPART) have preliminarily identified functionalities required under the above three

⁷ Ministry of Economy and Trade, Sectoral Operational Programme, "Increase of Economic Competitiveness" (Draft, April 2006) indicates three relevant areas – innovative and productive system, R&D for competitiveness and ICT for public private sectors. In addition to networking, other steps could involve educational, curriculum, regulatory and institutional reforms allowing commercial relations between universities and industries.

components. MoER also has preliminary details of functionalities needed to support the cross-border mobility of students and administer educational program resources. A group of TA Advisors from MoER will manage the Contractor's efforts on behalf of the Minister and will follow up Project implementation according to plan developed under this TA. The TA Advisors will assist the Contractor work with the Government and private sector stakeholders and facilitate their inputs relevant for planning the Project.

Scope of Work

The Technical Assistance Contractor (Contractor) needs to ensure that implementing the network enhancing investments planned under this Project TA would realize their intended development impact. In addition to skills to support EU job and growth targets⁸, the investments have to generate a community of life-long learning that can access knowledge at all levels of education and research to support innovation and economic competitiveness in the economy.

The Project planning approach and scope of work requires the Contractor to develop a strategic framework in which a variety of public-private initiatives for knowledge sharing and e-learning can link research and education with users in enterprises to improve overall competitiveness. In planning and optimizing the needed network links the Contractor needs to leverage new e-learning technologies by involving key stake holders (e.g. international firms setting up training centers, vendors and or financiers). The Contractor's approach should ensure that at Project completion, the network would provide an efficient platform for applications and content to enable curricula of universities and schools to complement enterprise resources and needs.

Based on the strategic framework developed the Contractor will decide the scope of a centralized platform for managing research and education towards the strategy. Next, the Contractor will identify the profile of skills and competencies that the e-learning content needs to generate. Where, who demands what skills will determine the phasing, the architecture and configuration of the platform at different points (campuses, IT Labs etc.) and dictate timing of the relevant network improving investments. The functionalities needed by enterprises at their preferred locations would form the bases for their collaboration with MoER under their respective Memorandums of Understanding (MOUs). The resulting resource sharing arrangements and related technical requirements for each phased investment would form a part of the Project implementation plan. The Contractor will identify immediate, medium and long-term investments working with national planners, enterprises, and university and school administrations in a participatory manner to ensure that national and enterprise level human resource plans are supported by the proposed e-learning content and technologies enabled by proposed infrastructures.

The Contractor will develop selected few (three or four) detailed results oriented contracts for the immediate and medium term phases of the Project to enable MoER to begin Project implementation using the available financing. Based on the strategic framework, the Contractor will develop a simple mechanism for monitoring the results and development impacts of the network enhancements to be used by MoER during Project implementation.

The TA Contractor shall carry out the following tasks:

Task I: Develop the planning framework

Prepare an approach paper conveying the strategic vision of how best to integrate the three networks. The approach paper will assess the macroeconomic level of IT investment justified for investing in technology enhancements to create jobs and growth as planned by Ministries of Education and Research as well as Economy and Trade. The approach paper will review and report on:

(a) International developments in e-learning and resources at U.S. universities, schools, academic and research

⁸ See i2010: Fostering European e-Learning Content to Make Lisbon a Reality, 20 October 2005 (www.elig.org).

centers, particularly those leveraging school and university curricula to share research and innovation.

- (b) Data and issues related to enhancing Romania's competitiveness in Ministry of Economy and Trade's, Sectoral Operational Programme, "Increase of Economic Competitiveness" (Draft, April 2006) and EU references therein.
- (c) Recent developments in education and ICT sectors including plans to reform curricula introduce knowledge-enhancing networks and reorganize research focus etc. under World Bank or EU supported initiatives.⁹
- (d) Relevant EU directives and materials related to the i2010 initiatives and e-learning activities in EU, especially standards, technologies and systems appraised and advanced by the e-Learning Industry Group (www.elig.org).
- (e) Europe versus U.S. comparison by the 2007 EU Spring Council¹⁰ to set the broad investment parameters modernizing networks to meet employment and growth targets;
- (f) Sectors with short term, medium term and long-term requirements based on the recent uptake in demand for skills, with respect to jobs and growth targets in the National Development Plan, 2007-13 and EU commitments.
- (g) Use of existing networks for e-learning at IT labs in the schools, universities and research centers.

Deliverables:

1. The Contractor shall provide an Approach Paper detailing key issues in using knowledge networks and E-learning technologies relevant for Romania. Based on a rapid assessment of existing networks and e-learning employed in formal education and enterprise training the paper will identify the potential for increasing its use. This will include an economic analysis justifying the investment level needed to raise Romania's productivity in line with EU targets. Recommendations towards overall investment levels and there phasing, will be qualified and substantiated based on experience with other successful deployments of infrastructure, learning content, its management systems and life-long learning and private e-training arrangements. This will consolidate findings under Tasks I (a) through I (d) above.
2. The Contractor shall develop an Issues Paper for MoER managers and private sector stakeholders identifying issues deemed relevant for joint public-private participatory decision making on the Project parameters. The paper will contrast relate specifically identified needs in Romania with specific solutions at universities, firms and locations in the U.S. to help demonstrate value propositions from network optimization techniques, human resource development strategies or e-learning tools and technologies. It will also include a tentative list of U.S. establishments that Romanian academicians, policy and decision makers could visit in a future Orientation Visit to assess the TA recommendations and the Project plan.
3. The Contractor shall provide a brief Strategic Framework document based on MoER review of the Approach and Issues Papers. This will include broad estimates for guiding the investment plan under the Project. The Framework will translate parameters reviewed under Tasks I (d) through I (f) and based on I(g) into investment guidelines to enable MoER initially identify financing relevant for enhancements under different phases of the Project.

⁹ For more detailed information on education systems in Europe and Romania consult for example, the EURYDICE database, EURYBASE (<http://www.eurydice.org>); the World Bank's Knowledge and Economy Project as well as the national development plan for the education sector.

¹⁰ The Work Foundation, Brinkley, Ian and Lee, Neil: The knowledge economy in Europe – A Report prepared for the 2007 EU Spring Council". It concludes "Europe has developed knowledge based industries comparable in employment terms with the US but has failed to make the underpinning knowledge investment in areas such as R&D, ICT software and higher education"

Task II: Develop the profile of skill demands

The Contractor shall develop a profile and projections of knowledge based employment skills needed in Romania by domestic and international enterprises. As skills in *basic IT use* and *ICT related technologies* to manage IT assets become increasingly important employment, their demand will include more advanced *e-business and IT enabled operational* skills in future. As they become increasingly crucial for global competitiveness, innovation and growth, knowledge-based services have begun experiencing the highest job growth in EU. As competition in all industries is becoming global, employers require more skills enabling workers to view the world as one homogenous and networked marketplace to organize supply chains or logistics in. Knowledge workers need to interact much more, using e-mails, the web and the relevant IT enabled operational skills and aptitude sets need to become more relevant to integrate modern R&D with innovation for enhancing productivity on the job.

The Contractor shall:

- a. Assess the information on numerous EU e-learning and lifelong learning pilot projects available with the National Agency for Qualifications in Higher Education and Partnership with Social and Economic Environment (ACPART) and lessons from their success and failures.
- b. Assess the supply of trained graduates to advance job prospects with additional e-learning opportunities in three broad skill categories: (a) basic IT use; (b) ICT technologies; and (c) advanced IT enabled enterprise operations (including e-business). The Contractor will work with the Ministry of Labor, placement offices of universities, as well as the Vocational Employment and Training Department of MoER to profile the supply of trained graduates and their employment potential in knowledge based industries.
- c. Assess the demand and profile its quantum, quality characteristics and location in three broad skill categories in the short, medium and long terms using available data from private enterprises, HR specialists and managers.
- d. Analyze the skill gaps and projected demand in their categories using standard industry definitions and projections methodology (e.g. estimates from IDC, Gartner for Cisco, Microsoft etc.) and classifications. It will evaluate gaps between available skills of job seekers and opportunities identified. It will identify employment sectors to focus the needed training using e-learning technologies on the networks.
- e. Identify best practice technologies and applications of e-learning to expeditiously train knowledge workers, in consultation with U.S. IT firms in Romania and U.S. members of the e-Learning Industry Group Consortium (www.elig.org)¹¹.
- f. Map the technology suites identified (e) with relevant employment sectors (e.g. energy management, port security, health, finance etc.) identified in (d) to assess technology and infrastructure requirements of the needed e-learning programs in Romania.
- g. Conduct a detailed assessment of existing infrastructure at selected locations where network enhancements are contemplated in the immediate and medium terms.

¹¹ The vendors may include Accenture, Apple, Cisco, IBM, Intel, Sun and their e-education industry partners while the best practice locations may include universities, schools, research centers, as well as locations where U.S. vendors may benefit from demonstrating their value proposition in a future Orientation Visit. The visit may include a non-University Federal agency such as NIST or a public sector R&D, Technology and Innovation funding administration to allow the National Authority for Scientific Research and the MoER to establish a performance based grant resources allocation system. Other locations could include the Open Knowledge Initiative at MIT, American Society for Training and Development and possibly the Learning Systems Architecture Laboratory at Carnegie Mellon University.

Deliverables:

- (1) A demand analysis of skills and competencies: This will document the supply and demand of three sets of skills and competencies relevant for jobs in the knowledge economy: *basic IT skills, skills in managing ICT technologies* in the work place and those relevant *for IT enabled operations* in globally competitive knowledge based enterprises. It will identify key e-learning content needed to address development of the skills in the educated workforce, before, during and after employment taking a lifelong learning cycle approach. It will include:
 - a. A descriptive account of skills and competencies: The Contractor shall build upon earlier work, others, done by ACPART (National Agency for Qualifications in Higher Education and Partnership with the Economic and Social Environment) for EU projects and the National Authority of Sciences in relation to its competitiveness-enhancing mandate. The Contractor shall analyze and document the number of students and unemployed youth that have different quality grades of the three categories or sets of IT related skills and competencies based on inputs from the MoER Administrator for Public School Curricula. The Contractor shall also present similar data for those being trained by private enterprises. The combined profile shall developed as a descriptive account of both, the “stock” and “flow” of basic, technical and operational IT enabled skills.
 - b. A time and location phasing of skill needs: The Contractor shall present analyses of the timing and location of students, unemployed youth and their potential employers needing the enhanced e-learning networks. The analyses for demand for skills and competencies will establish where and when relevant e-learning and lifelong learning content will be delivered using improved networks. This assessment will present demographic and academic data on: (a) Planned enrollment growth and changes in IT related training plans and curricula; (b) Expressed interest and recruitment plans of international firms; (c) The delays and hurdles in hiring skilled employees; (d) The urgency for training by employers; (d) Need for lifelong learning; and (e) Plans for expanding training facilities etc.

Task III: Develop Network Functionalities and Parameters

Based on Task II recommendations, the Contractor shall evaluate and recommend the preferred Learning and Content Management Systems (LMS/LCMS) that form the “content” layer of the targeted modern infrastructure. The Contractor shall then recommend capabilities of the other layers of the INET and the required enhancements. The Contractor shall assess the “service” layer capabilities needed to ensure the managed content is delivered by servers where and when the users want it. The Contractor shall appraise capabilities of the “access” network at selected IT labs and other points of service to enhance in phases based on planning data from Task II and the Project framework developed in Task I.

This Task will focus on taking an integrated view of the three network functionalities so that they can function administratively as three Virtual Private Networks (VPNs) but managed physically as one INET and implemented as one INET Project.

The Contractor shall carry out a two-step appraisal of where and when the essential upgrades are justified within the strategic framework developed under Task I.

- a. As the first step, for each point of service on the centralized platform linking the three INETs the Contractor shall identify service, access and infrastructure requirements related to the following functionalities:
 - i. skills and competencies management by categories and profiles;
 - ii. learning content and curricula management to deliver categories and sets of skills;

- iii. learning resources management (including trainers, venues, equipments);
- iv. trainees management, evidence and full tracking including acquired set of skills and training history;
- v. key performance indicators related to training efficiency and suitability;
- vi. data mining capabilities for identifying profiles and patterns in education

The Contractor shall then assess the existing network services and access nodes/hubs at the research centers, universities and schools (e.g. RoEduNet, Railways, private networks etc.) to establish broad parameters to optimize the network upgrade strategy.

- b. As the second step, the Contractor shall evaluate network services and access points, especially on campuses of schools and universities where LMS/LCMS content is required earlier. Based on this evaluation the Contractor shall map the sequencing of upgrading key network segments to ensure outreach and bandwidth of the existing networks at each potential point of service (i.e. at each university or school campus, phased over time) is maximized and optimized in relation to the following:
 - i. The service, transmission and physical infrastructure layering of the available network at each point of service or network access and existing plans to develop the RoEduNet infrastructure;
 - ii. The reach of IP Protocol/Internet and access – local, national or international -- at each point of service / access and needed connectivity by enterprises; and
 - iii. The pricing of connectivity based on availability (from e-Gov), through RoEduNet (in collaboration with National Authority of Scientific Research) or through private providers.

Based on the above information and from surveys under Task II the Contractor shall decide all other network parameters and requirements to plan for modern access and services with which the established LMS/LCMS can operate to serve the users as planned. .

Deliverables:

1. A determination of network enhancements required: The Contractor shall document the following evaluations to be considered by the TA Advisors:
 - a. The location, volumes, quality and plans for e-learning, education and training programs at schools, universities and enterprises by categories and sets of skills to be addressed;
 - b. The profile of e-learning technologies needed under the Project by type of Learning Content Systems (LCS) and the Learning Content Management Systems (LCMS) capabilities required;
 - c. The key network functionalities (e.g. synchronous, asynchronous, multimedia or video-enabled distance learning etc.) needed to enable the selected e-learning technologies to be acceptably accessed and used;
 - d. The Contractor shall document the network connectivity and performance related service level requirements at each location in the short, medium and long term.
 - e. The Contractor shall document any implications for reducing start up costs of enterprise training activities especially in areas like Iasi and Timisoara with higher student population density.

[Note: The TA Advisors will make available to the Contractor any specific requirements of enterprises, universities and schools regarding their infrastructure in the form of technical surveys and operating data of existing networks as well as details of plans to enhance or modify them.]

2. An inventory of upgrades and enhancements needed: The Contractor shall develop an inventory of upgrades needed by location and targeted users as well as cost of upgrading in the form of a base plan to enable MoER TA Advisors select and prioritize the timing of needed upgrades within the strategic

framework developed under Task I. The planning data documented in the base plan shall include:

- a. Requirements and capabilities of existing infrastructure for different segments (e.g. hubs to points of service) in comparison to those proposed along with estimates of enhancement costs;
- b. Categories and levels of e-learning programs enabled by each enhancement, additional individual users and or enterprise training programs served; other indicators of end-user benefits related to enhancement expenditures;
- c. Details of existing and enhanced network functioning parameters to enable specifications in Service Level Agreements (SLAs) proposed for each point of service under Task IV.
- d. Preliminary investment cost estimates for proposed network upgrades, communications, services and applications for each point of service to enable MoER budget for the needed funding.

[Note: The TA Advisors will evaluate planning priorities with the Contractor to allow the time phasing of the Project Implementation Plan, based on the funding and the e-learning service expansions enabled at each point of service.]

3. The INET Project Implementation Plan: The Contractor shall consolidate all relevant data in an INET Project Implementation Plan that provides options to be pursued for each location (school, university or research center) on the basis of each of the three sub-networks (R-INET, U-INET and S-INET) benefiting as a single or clustered points of service:

- a. Content Management and Service Level Options: The Contractor shall document the targeted beneficiaries at each point of service who receive education, job or lifelong learning related skills and the relevant content (i.e. e-learning and LCS/LCMS suites) to be provided to deliver the benefits. The specific or shared nature of the content and the services required shall be presented as content management and service level options. The Contractor shall present the costs associated with the relevant applications and network service levels identified with each option evaluated and or recommended for each point of service.
- b. Network functionality options: The Contractor shall recommend the specific network functionalities to be supported by connectivity, performance and management of the network so that content, services and applications required at each point of service function as planned. The Contractor shall itemize the key requirements under: (a) Service Level Agreements (SLAs); (b) Licenses and vendor support agreement parameters for contracting service and applications layer providers (e.g. LMS/LCMS etc.); and (c) parameters to monitor output based contractual performance of the technology vendor/contractor to be selected.

[Note: TA Advisors will provide the Contractor the planning preferences of MoER based on the Project's funding sources or based on MOUs with private enterprises that may cover any specific point or cluster of service (e.g. three locations within a city or three university/school campuses in a region).]

- c. Network development options: The Contractor shall recommend optimal sequencing or development scenarios from alternatives for phasing and prioritizing different upgrades at each point of service to deliver intended development impact in a timely manner at different points of service in the short, medium and long terms.

The Contractor shall recommend one set of preferred network development options and its associated set of network functionality and content management service level options for each point of service. Based on the acceptance of the recommendations, the Contractor shall prepare tender documents under Task IV.

Task IV: Prepare Tender Documents:

The Contractor shall finalize a standard set of representative technical specifications to help MoER specify tenders for different network segments of the development option recommended and accepted by the TA Advisors under Task III. These representative specifications will be sufficient to define key elements of specific contracts funded in the short, medium and long terms by the relevant financiers identified by the MoER. The TA Advisors will provide the Contractor the best indications of sources of financing (e.g. EU, World Bank, Government, University or private enterprises) so that the tenders developed conform to their relevant procurement rules. The tenders developed will help launch the initial network modifications under the Project and serve as models based on which MoER can develop future tenders for other financiers or PPP arrangements structured later, using the same representative specifications.

The tender documents and specifications shall also enable MoER to manage the Project implementation based on results and outputs delivered to the beneficiaries at each point of service. The bidder delivering the required network functionalities with the minimum level of investment from MoER would most cost-effectively enhance the infrastructure at the relevant point of service. This mechanism would also be attractive for private enterprises collaborating with MoER using MOUs to furnish training and e-learning at the specific locations. This mechanism would ensure maximum benefits at the least cost to the MoER, constituting the fundamental economic rationale for the enhancements for each segment supported by the tender. No other financial analysis is required since MoER will not recover revenues at the point of service. The level of matching resources private enterprises bring to share with MoER at the point of service will also determine the market sustainability of the investment. Therefore, efficient procurement carried out under the relevant financing agency's acquisition rules would largely ensure the financial justification of the investment.

The Contractor may re-phase out the implementation of each network segment, equipment or content after developing the tenders in view of (a) funding for each of the network; (b) available facilities at each point of service; and/or (c) problems of access and available connectivity that may remain.

Deliverables:

1. Tender documents: The Contractor shall prepare tenders covering upgrades to serve the needs of at least one-third of the number of users projected needing skills in the short term under Task II (1). Based on the projected users specifications and points of service requirements, the Contractor shall develop detailed specifications in representative SLAs for at least a few major urban campus locations of interest to foreign firms intending to hire or train employee. The Contractor shall ensure preparing two tenders each for relevant network segments to be implemented during the short, medium and long terms. Therefore, approximately six tenders should cover key representative technical specifications for enhancing the network to address key categories of demands (e.g. enterprise training, university / school or lifelong learning) and sets of IT skills (e.g. basic IT use, technologies or IT enabled knowledge based operations) requiring e-learning applications at points of services serving the six largest areas. Tenders can then be finalized to launch the project immediately after the study as soon as MoER identifies a financier to review and approve the procurement actions.
2. Representative Tender Specifications: The Contractor shall provide minimum information on the following aspects of the tenders (these data should be provided for all points of service in the procurement plan, see below) :
 - a. List of works, goods and services to upgrade a network segment;
 - b. Financing information as per procurement requirements of financier;
 - c. Procurement procedures;
 - d. Detailed SLA specifications as performance parameters to monitor for authorizing payments
 - i. Network availability (e.g. 99.9 percent uptime);
 - ii. Customer requirements (as specified by enterprise or R-INET, U-INET or S-INET)

- requirements)
- iii. Services at customer premises (as specified);
- iv. Service activation (times/dates);
- v. Shared hub station (bandwidth / equipment);
- vi. Network equipment supplied by service provider (as specified);
- vii. Network connectivity to each point of service; and
- viii. Equipment to be provided or arranged for each segment
- e. Performance indicators and milestones to monitor output-based payments; and
- f. Schedule of output based payments at the delivery of the SLA-specified services.

3. Procurement Plan: The INET Project Implementation Plan will phase out the network services and functionalities required at each different points of service over time. The Contractors shall identify relevant contract packages to be procured using relevant SLA specifications (see above) once financing is secured. A phased procurement plan providing broad cost estimates of issuing the remaining tenders to complete the full upgrading of S-INET, U-INET and R-INET nationally will support the implementation plan. It will map representative specifications with each network segment to be enhanced in future.

Task V: Development Impact Assessment

The main economy-wide development impact will be to enhance the competitiveness of Romania, assessed in terms of jobs and growth as per the EU strategy. This, in turn, depends on efficiently: (a) expanding the networks to enable wider access to knowledge and (b) fostering e-learning to impart new knowledge economy skills. The Contractor shall develop plans to help MoER monitor the development impact of this project in these two areas as initially planned for under Task I.

The Contractor shall design a preliminary development impact analyses framework, in the form of 'Impact Assessment Questionnaires' and relevant 'Analytical Reports' to be derived from questionnaire data. MoER or other Government agencies can use this for basic reporting to the EU using standard metrics and indicators assessed during Task I in demonstrating how Project targets are realized by each successive contract implemented for a point of service.

In consultation with ACPART and the TA Advisors, the Contractor shall identify key indicators from among such as those advanced by The Maastricht Economic Research Institute on Innovation and Technology (MERIT) for all EU countries, and present relevant base data to enable MoER to monitor the following development impact outcomes of the Project, along the following lines:

- Infrastructure & Human Capacity Development (Network and Skilled Workers):

The indicators will help MoER monitor the industry-required outcome that the available pool of "IT-skilled" workers will increase by 50 percent as result of this Project.

The impact analyses framework will also help monitor how many of those whose skill needs were identified under Task II: (a) were trained for IT specialized career jobs under company-sponsored programs by MoER-MOU-partner firms, and or (b) accessed some network to take advantage of professional development and lifelong learning arrangements, and (c) man and operate the INET project.

The Contractor shall prepare Impact Analyses Questionnaires to collect data to ascertain institutional or enterprise participants' needs and outcomes from the INET Project. Presented to policy-makers and financiers in Analytic Reports before and after implementing a component at any one point of service, these data would quantify the Project's (or components') ability to:

- a. Help the education system to provide employees with necessary IT skills for: (a) a knowledge

- industry worker (IT enabled operational skills); (b) business professional (e-business and basic IT skills); (c) IT professional / developer (ICT technology skills); or (d) service sector employee basic IT skills).
- b. Raise the IT skills of inexperienced candidates (school/university leavers) and functionally experienced workers in the areas mentioned above.
 - c. Advance (a) the use of technology based devices; (b) use of applications specific to the entity; (c) use of 'back-office' systems and packages; (d) use of Internet and e-mail; (d) use of standard office applications; and (e) international IT enabled work.
 - d. Help entities raise the IT skills of employees to impact organizational growth by: (a) playing a larger role in deciding the future courses; (b) influencing decisions on business process changes; (c) improving innovation; (d) essentially deciding the competitiveness of the organization; (e) enabling business to be in-sourced or out-sourced.

- **Market Oriented Reforms:**

In infrastructure: The state, through the National Authority for Scientific Research, partly owns the physical IT infrastructure layer (RoEduNet), on which the transport layer of the network will convey e-learning applications and content. RoEduNet is partly owned by the Railways. The institutional arrangements facilitating its use by the MoER would go a long way in exploiting the Infrastructure Sharing Framework Agreements typically required of countries by WTO and international associations furthering open architecture of IT systems. Based on the network assessment under Task III, the Contractor shall indicate the number of SLAs that could benefit from "opening" or deregulating access to the heretofore regulated or "closed" RoEduNet infrastructure for use by private enterprise sponsored training and e-learning. As enhancements to link schools, universities and research centers call for different segments to enter this infrastructure at different points of service, its full opening for this Project implies unrestricted use by INET Project beneficiaries to include private enterprises, albeit on a chargeback basis. This would imply substantial market reforms. Its partial use by INET supported university-industry links, for example, would indicate partial market oriented reforms.

Education: Already IT firms and other private technology firms are sufficiently interested in collaborating with schools and universities and operating as training partners. Their programs are offering a unique value proposition that is competing away graduates from studying further in schools and universities. Additional interest in attracting internationally acclaimed universities, including those from the U.S. as partners is also growing. There is no indicator needed to monitor this outcome, as their growth will be public knowledge, but to the extent the course offerings can proliferate and allow e-learning to enable international and trans-European linkages, education reforms will be deepened.

- **Technology Transfer and Productivity**

The Contractor shall identify any potential model for commercializing research in Romania, which could benefit from the INET Project and develop regulatory recommendations to support its operation. One critical enabler of research to further economic growth is the linkage most commonly observed in technology parks all over the world. Such state sponsored university-industry linkages have helped commercialize MP3 in Germany and U.S. universities routinely accept industry problems as the basis of teaching and case materials. Developed by the Fraunhofer System of Germany, this model also helps U.S. firms with testing certification of software (at University of Maryland, College Park), automobile technologies (at University of Michigan, Ann Arbor) and through collaborations in bio-medical engineering (at Johns Hopkins University, Baltimore).

Deliverable:

Development Impact Assessment Framework: The Contractor shall design and deliver a tested Impact Analyses Questionnaire used to develop data assessed under this task and an initial set presented as base data in the Initial Analytic Report. MoER will use this Initial Analytic Report as base data to report the Project's development impact during and after implementation to its financiers and government policy makers.

Task VI: Final Report

The TA Contractor shall prepare and provide to the Grantee and to USTDA a Final Report in accordance with Clause __ of Annex II of the Grant Agreement. Each of the above tasks in this Terms of Reference must be distinctly set forth in the Final Report in a substantive and comprehensive manner, and shall include all corresponding deliverables. The Final Report shall contain an executive summary. In addition to any other required deliverables in accordance with Clause __ of Annex II of the Grant Agreement, the Contractor shall provide both the Grantee and USTDA with a Public Version of the Final Report on CD-ROM. The CD-ROM version of the Final Report shall include:

- Adobe Acrobat readable copies of all documents;
- Source files for all drawings in AutoCAD or Visio format; and
- Source files for all documents in MS Office 2000 or later formats (note: these files may be provided in equivalent readable formats).

L. STUDY BUDGET

The total budget recommended for this study is \$366,841 of which direct labor is an estimated 233 billable days (including travel) costing 253,900 and other costs amount to \$112,941.

Details are in the following tables.

ROMANIA
TECHNICAL ASSISTANCE (PROJECT PREPARATION)
INTEGRATED NETWORK FOR EDUCATION AND TECHNOLOGY (INET) PROJECT
BUDGET

	Daily Rate	Total Days	Total Labor Cost
TECHNICAL ASSISTANCE TEAM			
Sr. Academic/Economic Advisor (Team Leader)	1200	54	\$64,800
Sr. Human Resource Specialist	1100	59	\$64,900
Sr. Systems / Network Integrator	1100	42	\$46,200
Project Analyst	<u>1000</u>	<u>78</u>	<u>\$78,000</u>
DIRECT LABOR COSTS:		233	\$253,900

INPUTS BY TASK	Task I	Task II	Task III	Task IV	Task V & VI
<u>Billable Days incldg. Travel</u>					
Sr. Academic/Economic Advisor	54	22	17	0	15
Sr. Human Resource Specialist	59	17	22	0	4
Sr. Systems / Network Integrator	42	0	0	22	20
Project Analyst	78	6	10	22	20
Total Billable days	233	45	49	44	51

<u>Subsistence Days in Field</u>					
Sr. Academic/Economic Advisor	39	22	17	0	0
Sr. Human Resource Specialist	55	17	22	0	16
Sr. Systems / Network Integrator	58	6	10	22	0
Project Analyst	70	6	10	22	12
Total	222	51	59	44	28

OTHER DIRECT COSTS:	Unit	Unit cost	Total Cost
<u>Administrative</u>			
1. Technical surveys (a)	20	\$1,000	\$20,000
2. Translation / Interpretation			\$2,200
3. Internet and Communications/month	4	\$250	\$1,000
4. Reproduction/Binding			\$500
5. Medevac Insurance	7	\$163	\$1,141
5. Office space (b)			
	Sub-Total Administrative		\$24,841

<u>Logistics</u>			
<u>Travel</u>			
International Air Travel	11	\$2,400	\$26,400
Airport transfers, Visas, etc.	11	\$180	\$1,980
In Country Air/Land Transportation			\$2,000
	Sub-total Logistics		\$30,380

<u>Per Diem (Hotels, Meals & Incidental Expenditure)</u>			
	Trip Days	Per Diem Rate	
Sr. Academic/Economic Advisor	39	\$260	\$10,140
Sr. Human Resource Specialist	55	\$260	\$14,300
Sr. Systems / Network Integrator	58	\$260	\$15,080
Project Analyst	70	\$260	\$18,200
	Sub-total Per Diem		\$57,720

TOTAL OTHER DIRECT COSTS: **\$112,941**

TOTAL COSTS (DIRECT LABOR COSTS + OTHER DIRECT COSTS): **\$366,841**

(a) Technical tender specifications and site surveys for upgrading network segments, hubs and other access points. Students at universities and schools may need to be surveyed to canvass planning data on skills, systems & training.

(b) MoER, Universities or Agencies may provide space otherwise Contractor will need to arrange this at their expense.

**ROMANIA
TECHNICAL ASSISTANCE (PROJECT PREPARATION)**

**INTEGRATED NETWORK FOR EDUCATION AND TECHNOLOGY (INET)
WORK PLAN
(No: Labor Days by Contractor Staff)**

Labor Week ----->
Trips Days 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
(Incl. Addl. 2 days for each trip)

Task 1: Develop the Planning Framework <----->

Sr. Academic/Economic Advisor	1	22	6	5	5	6																		
Sr. Human Resource Specialist	1	17	6	5	6																			
Sr. Systems/Network Integrator		0																						
Project Analyst	1	6			6																			

Task 2: Develop the Profile of Skill Demand <----->

Sr. Academic/Economic Advisor	1	17					6	5	6															
Sr. Human Resource Specialist	1	22					6	5	5	6														
Sr. Systems/Network Integrator		0																						
Project Analyst		10				5	5																	

Task 3: Develop Network Functionalities & Parameters <----->

Sr. Academic/Economic Advisor		0																						
Sr. Human Resource Specialist		0																						
Sr. Systems/Network Integrator	1	22												6	5	5	6							
Project Analyst	1	22												6	5	5	6							

Task 4: Prepare Tender Documents

Sr. Academic/Economic Advisor		0																						
Sr. Human Resource Specialist		4																		1	1	1	1	
Sr. Systems/Network Integrator	1	20																		5	5	5	5	
Project Analyst	1	20																		5	5	5	5	

Task 5: Development Impact Assessment 1/

Sr. Academic/Economic Advisor		15																					5	5	5
Sr. Human Resource Specialist	1	16																		4	4	4	4	0	
Sr. Systems/Network Integrator		0																							
Project Analyst	1	20																				5	5	5	5

Task 6: Prepare Final Report 1/

All Tasks Total

Sr. Academic/Economic Advisor	2	54	6	5	5	6	0	0	6	5	6	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5
Sr. Human Resource Specialist	3	59	6	5	6	0	0	6	5	5	6	0	0	0	0	0	0	0	0	0	0	0	5	5	5	0
Sr. Systems/Network Integrator	2	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	5	6	0	5	5	5	0	
Project Analyst	4	78	0	0	0	6	5	5	0	0	0	0	0	0	0	0	6	5	5	6	0	5	10	10	10	5
	11	233	12	10	11	12	5	11	11	10	12	0	0	0	0	0	12	10	10	12	0	15	20	25	25	10

TA Advisors Group Review Mtgs.

3 Project Coordinators/Representatives 2/			X	X			X	X						X		X				X	X					
			3	3	3	3	3	3	3	3	3			3	3	3	3	3	3	3	3	3	3	3	3	3

1/ The level of Effort for preparing the Final Report (Task VI) is combined with Task V person=days total.
To be provided to the USTDA one month prior to departure date, in week 7, so that an OV Contractor may manage the logistics.
2/ Ministry will make available one project Component Coordinator to work with the TA Contractor for one day a week at no cost.
The TA Advisors Group will meet frequently with the Contractor as arranged by the Coordinators.study team to clarify understandings

M. RECOMMENDATIONS

The DM recommends USTDA provide Technical Assistance (TA) to the Ministry of Education and Research to help prepare a Project to be implemented in response to Minister Hardau's request. The recommended TA will develop a comprehensive solution responding to immediate and long-term needs identified within a development framework to exploit successes the Ministry has enjoyed in collaborating with U.S. IT firms. The selected Contractor will possess a blend of education sector and IT project expertise to deliver this TA best. The DM recommends USTDA finance the TA by a grant of \$366,841. The U.S. Foreign Commercial Service in Bucharest can convey the next steps to the Minister to finalize the needed agreements.

To enable TA Contractors to deliver a practical and feasible Project, Romanian decision-makers knowledgeable of their education sector reforms will need to appraise the needed e-education systems and their functions in the U.S. Therefore, the DM recommends that an Orientation Visit be organized to follow this TA. The TA Contractor shall plan for feasible U.S. style solutions to transfer know how from Romania's education system to its enterprises. The optimal networking solutions including e-learning technologies will serve the positive development impact creation and the trade agenda of USTDA assistance very well. In addition to enabling U.S. sourced goods and services facilitate skill, productivity and overall enterprise level enhancements in Romania, it could well position U.S. firms to replicate similar offerings in other European countries to realize similar results.

Such success, following recent growth in knowledge driven activities in Romania will bode well for U.S. educational institutions to expand their presence more commercially in Romania and possibly in Eastern Europe. Towards that, the DM recommends following up the nascent interest by international investors in franchising U.S. accredited education and training in Romania. The DM recommends U.S. Commercial Service and the TDA follow this with Dr. Varjun Pambuccian, a Member of Parliament, and leading proponent of IT-led market reforms, who conveyed this interest to the DM.

N. PROJECT PORTFOLIO ASSESMENT

The DM met with Ms. Diana Stengu at the Ministry of Communications and Information Technology. She rose no significant issues regarding the ongoing USTDA supported Technical Assistance and was supportive of the DM proposal to provide the Ministry of Education and Research the needed assistance.

ANNEX I: EDUCATION SYSTEM, ONGOING REFORMS & IT INFRASTRUCTURE

The Education System

Since early 2001, the Ministry of Education and Research (MoER) has been responsible for managing the education and research functions of the government. As a single Ministry, MoER manages the national system of research as well as public education at four levels. At the highest central level, MoER manages the regional inspectorates responsible for pre-tertiary education. In each region, a Department of Education administers funds allocated from the local budget, of which the largest is in Bucharest. At the local level, municipalities manage schools.

Basic compulsory education starts at age 7 (i.e. primary education in grades 1-4), after which based on an examination, students get admitted to upper schools (grades 10-12 for full-time study or 10-13 for part-time) which are not compulsory. Students can also attend five years of theoretical or academic schools (*or liceu*); or 2-4 years of vocational school (*scoala profesionala*); or up to three years apprenticeship school (*scoala de ucenici*) providing a *baccalaureate, diploma or certificate*, respectively.

Higher education comprises 3-year colleges offering a diploma or 3-6 year college and university level programs offering degrees. Continuing education courses up to 1 year focus on specific employment skills, advanced studies for university graduates (1 to 2 year) and masters degrees and postgraduate programs (for 2-3 years) or doctoral programs (4-6 years).

The universities have a great degree of financial autonomy but still rely on Ministry sponsored accreditation, research grants and international cooperation arrangements. Graduates of colleges can continue their studies in university programs after qualifying in competitive entrance examinations open also for high school graduates holding a baccalaureate diploma. In 2003, an estimated 457,000 students were enrolled in public and private higher education with 125,000 graduating that year.

Higher Ed. Specialty	2002/2003	
	Total	%
Total		
Technical	126,128	27.6
Agriculture	22,316	4.9
Economy	92,578	20.2
Judicial	26,218	5.7
Medical/ Pharmaceutical	30,767	6.7
University	151,223	33.1
Arts	8,029	1.8
Total	457,259	100.0

Ongoing Reforms

The ongoing reforms in the education system aim to harmonize Romania's standards with those of EU following commitments made in context of the Bologna Declaration. The creation of a pro-Bologna university environment requires structuring programs in line with European higher education: a Bachelor's degree with 180-240 credits, a Master's with 120-60 credits and a PhD candidacy for which a Master's degree is an essential pre-qualification. Numerous EU programs are piloting a transferable credit system, aimed at facilitating international mobility of the students. Teachers, faculty and student exchange programs have expanded their academic interactions that now include on-line exchanges and these contacts now need to be formalized and strengthened. In addition to networking needed to facilitate the academic linkages, seamless delivery of pedagogical content also places increasing demands on existing IT assets. The Lisbon Agreement followed by the i2010 initiative requires fostering e-learning

initiatives: to increase competitiveness in knowledge-based economies, create more and better jobs, make the education system and processes more effective, and develop social cohesion in the European learning society.

EU level harmonization now requires reforms to enable a common content-rich core of educational materials and interchanges to equip citizens with new competencies. They require enabling the educated to use tools interactively interact with heterogeneous academic and research groups and act autonomously to get more creative and innovate. Towards this, in re-designing compulsory basic education for the 21st century, the need to deliver a common core of key competencies has increased along with increased subject-based teaching in curricula. Thus, along with demand for more 'traditional' subject-based content, there is also an increasing demand for innovative digital education content to develop new key competencies. The first attempt towards this in Romania was under the SEI initiative during 2002-2004 (see below).

With globalization, the need for workers everywhere is to be 'competency-rich' for which European educators are developing content offerings so that employers can find workers who can help them compete better in a global market. Games technology is an excellent example of how new skills for communications, problem solving, reasoning, creativity, motivation, teamwork and the ability to learn can develop in informal IT enabled learning environments. As digital games spread and transcend national boundaries, European educational technology industry strives to catch up with happenings in the U.S. By partnering U.S. firms, research bodies and educational institutions and with the support of the EU, the European e-content industry is enabling change in education sector, beginning a break with more traditional forms of content creation.

To date, the outcome of higher education reforms remains mixed towards using this content. The skill-focused content of higher education has not improved and the system takes the blame for Romania's lack of competitiveness. The university system still concentrates on transfer, memorization and reproduction rather than acquisition, creation or application of knowledge. It does not permit sufficient choices for individualized training or creative achievement, but bases rewards on volumes of information, classes, examinations that a student can pass through. The system uses national standards of achievement that emphasize general qualifications even though priorities have changed worldwide to reward specialized and graduate level innovative work. A centralized system, managed by high-ranking officials susceptible to corruption in grading, competitions, job offers, and examinations, persists, as does the lack of transparency in rewarding research and competencies. Recently, an ICT driven competitive admission scoring and decision announcement system implemented for the school leavers seeking university admissions brought in significant amount of transparency. This demonstrated that proposed network improvements should also support systems to manage education well, apart from modern content.

Therefore, the reform strategy in line with the EU agenda retains the following priorities. First, the government intends to improve the infrastructure for education and promote IT use. It grants large investment budgets to universities pursuing such goals. Second, it is encouraging a shift from transferring information to enabling ability to generate knowledge by new interdisciplinary curricula complying with EU standards and harmonization. "Centers of excellence" in better universities now support graduate education and reforms in exams that enable reliable nationwide comparable evaluations. In reassessing the role of scientific research, increasing connections with teaching integrate it better into universities forming a strong knowledge base for graduate studies. These reforms are bringing Romanian university system closer to the European model emulating successes of university industry linkages. An example, the German Fraunhofer model, has successfully served U.S. industry through investments near campuses in Ann Arbor (auto industry), Boston (IT) and Maryland (software).

Nevertheless, universities remain focused on the educational capabilities of the provider rather than the demands of students or their potential employers, the "customers". Offerings reflect the eminence of the teaching profession rather than needs of the economy. MoER is attempting to make the education system responsive through new programs uniting teaching, research and training of professors but much remains to be done. Financial resources are inefficiently used and the MoER no longer possesses the administrative advantage upon universities and their autonomy has not resulted in improvements. There is little incentive for universities to change, innovate, and improve. Lately firms like Scumberger, Siemens, Alcatel, Solectron, and Infineon are setting up apprentice programs with universities to change this situation (see below).

In spite of this, private education sector is providing for increases in student enrollments, but its quality remains debatable. With EU membership, the recent upsurge of interest from technology firms to engage the MoER and the universities has begun to reverse this stalemate and attract graduates whose skill exposure at pre-university stage has been positively affected by private sector programs. New curricula plans for pre-university education allow for extra-curricular classes using ICT and new IT subjects have begun relying on multimedia techniques using virtual university formats.

Cisco has complemented its school and network academy programs with high school and vocational training curricula at more than 11 regional and 84 local level academies. Since 2003, Oracle has delivered IT skills to some 8,000 school and university graduates recently opened 10 centers with 350 specialists to employ some 800 people during the last decade. It sponsors five PhD candidates also. Microsoft, in marking its tenth year, has just opened a global technology service center employing 100 specialists to support its worldwide operations. To accelerate this skill generation, infrastructure improvements are now needed to both, streamline education and reduce the set up costs for potential foreign direct investors wishing to exploit the Romanian technology and education advantage for competing globally.

The IT Infrastructure for Education

Recent Government investments in IT infrastructure for education exceed \$600 million; of this, \$200 million were for implementing the National Computer-Based Education System program (SEI) aimed at retooling ICT education in upper secondary schools. Under SEI, high schools were provided with computers, standard software, and connectivity equipment, plus technical support. Over 1,500 computer laboratories were installed and configured (of which 1,220 were installed between 2001 and 2003) to cover 20 percent of schools. By 2004, SEI delivered educational software, content and knowledge management, administrative support software platforms (AEL LCMS) as well as multimedia content for some 430 lessons. About 14,000 teachers and 2,600 administrators were trained in SEI.

The Government wished to further expand the use of computers, building on the lessons of the SEI project. At the beginning of the \$70 million, World Bank supported Knowledge Economy Project in 2005, all universities, two-thirds of the secondary schools and some 5 percent of primary schools were connected to the Internet. Every 100 students in universities had access to 17 computers with 12 connected to the Internet. In high schools of the 11 with access, eight connected, and in primary schools of the two, two only one connected to the Internet. The project aims to connect 472 public schools, 260 local administration offices, 260 local libraries, and 260 public access points targeting more than 1,740,000 inhabitants covering 18 percent of the rural and small towns and about 8 percent of the total population. Mostly all high schools have IT Labs typically with 25 workstations. Software applications to support new educational content has enabled over 250 lessons developed, covering numerous disciplines of the high-school syllabus to be delivered. Communication between the Ministry and educational institutions and inspectorates are organized through the www.portal.edu.ro portal. However, national plans are still to provide every school sufficient Internet connected computers and encourage sharing resources wherever possible.

A key element of supporting this infrastructure expansion strategy successfully is teacher training. Since 1998, the Ministry has conducted national level programs for teacher training to help adopt curricula at universities and colleges and train future teachers. These programs are now available to all age groups and link to professional re-training and lifelong learning arrangements managed over open and distance learning modalities. Universities use general, professional re-training, revised professional knowledge courses and seminars that even lead to a degree or post-graduate work. Distance learning and e-learning programs are also developing rapidly in Romania as result. The Virtual Business University available over the Internet at www.uva.ro – is an application developed by the National School of Political and Administrative Studies and www.academiaonline.ro is an e-learning portal.

This deepening of technology supported educational reforms has led to a stream of public-private partnerships focused on expanding ICT use in schools and at university and pre-university levels. Business opportunities in connecting them to the Internet, training teachers, network managers etc. have further attracted numerous private industries, NGOs charities and foundations as well as other ministries or governmental agencies. MoER has signed

Memoranda of Understanding (MOUs) with Sun Microsystems in 1997, with Cisco and the Ministry of Defense in 1998, with Procter & Gamble, Oracle, Microsoft, Open Society Foundation, Ministries for Culture, Agriculture, Youth and Sports in 1999, National Agency for Science, Technology and Innovation in 2000 and associated programs of IBM, Xnet, Save the Children Foundation, and PROTV. Many teachers and senior school staff has participated in study visits or pilot projects that focused on ICTs through EU Programs such as Socrates, Leonardo da Vinci, Tempus, etc.

As result of successive MOUs universities and pre-university centers have began opening distance learning and teaching arrangements. The Academy of Economic Studies in Bucharest (www.ase.ro) has had over 17,000 students enrolled in Open Economic Distance Learning in 17 towns and cities. Cisco Networking Academy Program has more than 11 regional and 84 local academies. Since 2003, similar programs with Oracle have led to a surge in the number of academic centers offering ICT specialization. Although the overall number of ICT specialists that now graduate in Romania would be sufficient to cover the current needs of the Romanian economy, the highly skilled work force is concentrated in the big cities (especially in Bucharest) or emigrates, leaving the demand for such specialists uncovered in rural areas and smaller towns.

With its membership in EU, international firms are showing tremendous interest in hiring appropriately skilled graduates in Romania. NGOs like the Bill and Melinda Gates Foundation are also considering investments to link all public libraries to expand public access to available knowledge bases. It is therefore becoming increasingly important for MoER to expand the functionalities on its networks to support skill development and training needs throughout the country. Not only will the modern IT platforms facilitate interactions within Romania and with Europe for conveying knowledge, content and for managing it, it will also reduce the set up costs for enterprises to impart training in new competencies needed to compete globally. The combination of physical networks and an IT savvy workforce would then form the infrastructure attraction for further foreign direct investment.

The Existing Networks:

The Romanian Education Network (RoEduNet) is the basic network aiming to serve all education centers. It also serves all non-profit organizations that advance education, R&D, research and or cultural activities. Connecting schools to it ensures access to all modern scientific and educational information on the network. This can variously be packaged by content management systems, as relevant using modern multimedia technologies, open and distance learning arrangements and structured knowledge-ware.

RoEduNet aims to supports functions and applications for research, education, training, as well as its management and administration from the centre (at MoER) to the last municipality and or school and the other way around. Its sound integration with public education institutions and its access by citizens (parents, pupils, students, etc.) requires it to exploit existing systems better. It needs to integrate facilities at main universities, central libraries, MOER, local authorities and county level schools etc. to start offering services to the public. This requires preserving international technical standards so that national, regional and local initiatives and or sponsors can continue enhancing RoEduNet operations, as they have developed to date, up to level 2, and need to further beyond that, in parallel with the INET Project:

- (a) A national 2Mbps fiber optic network (level 0) connects six regional hubs (Installed 1998)
- (a) Data communications infrastructure in Cluj with fiber optic links to all education centers (Installed 1998).
- (b) Bandwidth increased from 2Mbps to 6 Mbps for diversifying ISPs I Taide and Orion (Commissioned 1998).
- (c) Linking 6 regional hubs to county level POPs with 256Kbps optical fiber -- SDH (level 1) in 2000 with over 10 connections serving every county capital town as of now.
- (d) Extending the RoEduNet by setting up more POPs in every county (level2).
-
- (e) Extending connectivity and access for end-users in universities, libraries and schools (level 3).
- (f) Installing a wireless broadband system for Bucharest for access by end users of high-speed transmissions.
- (g) Developing strategic cooperation with IT and technology firms through public-private partnerships.
- (h) Improving broadband connectivity with European Data Transport Highway (GEANT) through RN1 serving EU research, education and training centers.

- (i) Raising bandwidth and capacity of Levels 0, 1 and 2.
- (j) Developing RoEduNet network capacities for:
 - a. Enhanced web site publishing
 - b. Enhance open and distance learning;
 - c. Support EU university management system (PHARE);
 - d. Enhance pre-university management system (Education Reforms started by World Bank);
 - e. Enhance video-enabled techniques;
- (k) Expanding access of schools to the National Electronic System (NES) launched in 2003. This was originally designed to increase the efficiency in public administration, reduce costs for public and private entities, limit potential for corruption, and increase public trust in education administration. Its portal still remains largely non-interactive and provides a limited service. Major challenges are to develop the proper system for monitoring and evaluation, getting feedback from users, and scaling-up pilots. Citizen awareness of and access to the government e-services in the education domain remains low and needs to be facilitated by modernizing NES functionalities at the school level.
- (l) Since RoEduNet network is managed by MoER its elements that need strengthening based on plans and the development agenda for research, universities and schools managed by MoER, are the subject of this project.

ANNEX II: REQUESTS FOR ASSISTANCE

The Initial Request from the Ministry



ROMANIA MINISTRY OF EDUCATION AND RESEARCH

To: **United States Trade and Development Agency**
Mr. Daniel STEIN, Regional Director
Cc: **Mrs. Andrea LUPO, Country Manager**
Tel: 703 - 875 - 4357, Fax: 703 - 875 - 4009

Letter of interest

We would like to take this opportunity to express our interest in establishing an IT laboratories network for the Romanian universities according to the Strategy and the Priorities of the National Development Plan for 2007-2013 which foresee the necessity of promoting programs and projects for RDI by the universities or research institutes, acquiring modern and efficient equipment, development of special departments for covering areas of high technology.

In this purpose we support the idea of a feasibility study for the Romanian universities which will be achieved by the National Agency for Qualifications in Higher Education and for Partnership with Economic and Social Environment (ACPART Agency) in order to underline the following issues:

- The assessment of the current situation of the IT laboratories architecture and the efficiency of the IT courses at the university level;
- The evaluation of the concordance between the IT architecture, education offer, the national network and the IT demand on the labor market;
- Related investment efforts (economic and timing);
- Economic tools, mechanisms and scenarios for investment recovery.

We consider that ACPART Agency is able to reach this objective according with one of his main mission which is to promote and support cooperation between universities and economic stakeholders, organizations and institutions.

The financial support of the United States Trade and Development Agency is very welcome for the mentioned feasibility study accomplishment.

We look forward to continuing the dialogue with you and we hope that the development of this particular project will lead to an efficient cooperation between our institutions.

MINISTER,
Mihail HĂRDĂU

Bucharest, 15.01.2006

Revised Request from the Minister of Education and Research



ROMANIA MINISTRY OF EDUCATION AND RESEARCH

To: **United States Trade and Development Agency**
Mrs. Andrea LUPU, Country Manager

Letter of interest

We would like to take this opportunity to express our interest in developing the existing network for the education and research according to the Priorities of the National Development Plan for 2007-2013.

In this purpose we support the idea of a feasibility study for the Ministry of Education and Research in order to underline the following issues:

- The evaluation of the concordance between the IT architecture, education offer, the national network and the IT demand on the labor market;
- Introducing new concepts in order to facilitate the synergy of information and resources for the modernization of the educational system;
- e-Government of the educational systems management (e.g. economic tools, mechanisms and scenarios for investment recovery; development of an IT support for the National Register for Qualifications in Higher Education; development of an IT network for the management of higher education).

We basically agree that the projects mentioned above can be upgraded in one single synergic project.

The financial support of the United States Trade and Development Agency is very welcome for the mentioned feasibility study accomplishment in order to further planning an overall program of reform.

We look forward to continuing the dialogue with you and we hope that the development of these projects will lead to an efficient cooperation between our institutions.

MINISTER
Mihail HĂRDAU



Bucharest, 23.02.2007

ANNEX III: CONTACTS FOR THE DEFINITIONAL MISSION

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ANNEX 3



**U.S. TRADE AND DEVELOPMENT AGENCY
Arlington, VA 22209-2131**

NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS

The purpose of USTDA's nationality, source, and origin requirements is to assure the maximum practicable participation of American contractors, technology, equipment and materials in the prefeasibility, feasibility, and implementation stages of a project.

USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):

Except as USTDA may otherwise agree, each of the following provisions shall apply to the delivery of goods and services funded by USTDA under this Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from host country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for implementation of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in host country are not subject to the above restrictions. USTDA will make available further details concerning these standards of eligibility upon request.

NATIONALITY:

1) Rule

Except as USTDA may otherwise agree, the Contractor for USTDA funded activities must be either a U.S. firm or a U.S. individual. Prime contractors may utilize U.S. subcontractors without limitation, but the use of host country subcontractors is limited to 20% of the USTDA grant amount.

2) Application

Accordingly, only a U.S. firm or U.S. individual may submit proposals on USTDA funded activities. Although those proposals may include subcontracting arrangements with host country firms or individuals for up to 20% of the USTDA grant amount, they may not include subcontracts with third country entities. U.S. firms submitting proposals must ensure that the professional services funded by the USTDA grant, to the extent not subcontracted to host country entities, are supplied by employees of the firm or employees of U.S. subcontractor firms who are U.S. individuals.

Interested U.S. firms and consultants who submit proposals must meet USTDA nationality requirements as of the due date for the submission of proposals and, if selected, must continue to meet such requirements throughout the duration of the USTDA-financed activity. These nationality provisions apply to whatever portion of the Terms of Reference is funded with the USTDA grant.

3) Definitions

A "U.S. individual" is (a) a U.S. citizen, or (b) a non-U.S. citizen lawfully admitted for permanent residence in the U.S. (a green card holder).

A "U.S. firm" is a privately owned firm which is incorporated in the U.S., with its principal place of business in the U.S., and which is either (a) more than 50% owned by U.S. individuals, or (b) has been incorporated in the U.S. for more than three (3) years prior to the issuance date of the request for proposals; has performed similar services in the U.S. for that three (3) year period; employs U.S. citizens in more than half of its permanent full-time positions in the U.S.; and has the existing capability in the U.S. to perform the work in question.

A partnership, organized in the U.S. with its principal place of business in the U.S., may also qualify as a "U.S. firm" as would a joint venture organized or incorporated in the United States consisting entirely of U.S. firms and/or U.S. individuals.

A nonprofit organization, such as an educational institution, foundation, or association may also qualify as a "U.S. firm" if it is incorporated in the United States and managed by a governing body, a majority of whose members are U.S. individuals.

SOURCE AND ORIGIN:

1) Rule

In addition to the nationality requirement stated above, any goods (e.g., equipment and materials) and services related to their shipment (e.g., international transportation and insurance) funded under the USTDA Grant Agreement must have their source and origin in the United States, unless USTDA otherwise agrees. However, necessary purchases of goods and project support services which are unavailable from a U.S. source (e.g., local food, housing and transportation) are eligible without specific USTDA approval.

2) Application

Accordingly, the prime contractor must be able to demonstrate that all goods and services purchased in the host country to carry out the Terms of Reference for a USTDA Grant Agreement that were not of U.S. source and origin were unavailable in the United States.

3) Definitions

“Source” means the country from which shipment is made.

"Origin" means the place of production, through manufacturing, assembly or otherwise.

Questions regarding these nationality, source and origin requirements may be addressed to the USTDA Office of General Counsel.

ANNEX 4

USTDA # 07-81007B
ROM

ASJ. P. Ann	10/1/07
DEVELOPMENT AGENCY	
SEP 28 2007	
AL. D. S. M. V. D. W. E. K.	

GRANT AGREEMENT

This Grant Agreement is entered into between the Government of the United States of America, acting through the U.S. Trade and Development Agency ("USTDA") and the Romanian Ministry of Education, Research and Youth ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US\$366,841 ("USTDA Grant") to fund the cost of goods and services required for Technical Assistance ("TA") on the proposed Integrated Network for Education and Technologies Project ("Project") in Romania ("Host Country").

1. USTDA Funding

The funding to be provided under this Grant Agreement shall be used to fund the costs of a contract between the Grantee and the U.S. firm selected by the Grantee ("Contractor") under which the Contractor will perform the TA ("Contract"). Payment to the Contractor will be made directly by USTDA on behalf of the Grantee with the USTDA Grant funds provided under this Grant Agreement.

2. Terms of Reference

The Terms of Reference for the TA ("Terms of Reference") are attached as Annex I and are hereby made a part of this Grant Agreement. The TA will examine the technical, financial, environmental, and other critical aspects of the proposed Project. The Terms of Reference for the TA shall also be included in the Contract.

3. Standards of Conduct

USTDA and the Grantee recognize the existence of standards of conduct for public officials, and commercial entities, in their respective countries. The parties to this Grant Agreement and the Contractor shall observe these standards, which include not accepting payment of money or anything of value, directly or indirectly, from any person for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the TA.

4. Grantee Responsibilities

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support.

5. USTDA as Financier

(A) USTDA Approval of Competitive Selection Procedures

Selection of the U.S. Contractor shall be carried out by the Grantee according to its established procedures for the competitive selection of contractors with advance notice of the procurement published online through *Federal Business Opportunities* (www.fedbizopps.gov). Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information and/or approval.

(B) USTDA Approval of Contractor Selection

The Grantee shall notify USTDA at the address of record set forth in Article 17 below upon selection of the Contractor to perform the TA. Upon approval of this selection by USTDA, the Grantee and the Contractor shall then enter into a contract for performance of the TA. The Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the TA that they were not selected.

(C) USTDA Approval of Contract Between Grantee and Contractor

The Grantee and the Contractor shall enter into a contract for performance of the TA. This contract, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing. To expedite this approval, the Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 17 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract.

(D) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of funding the TA and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Grantee or USTDA from asserting any right they might have against the

Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Grantee or USTDA.

(E) Grant Agreement Controlling

Regardless of USTDA approval, the rights and obligations of any party to the contract or subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and any contract or subcontract funded by the Grant Agreement, the Grant Agreement shall be controlling.

6. Disbursement Procedures

(A) USTDA Approval of Contract Required

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Grantee's contract with the Contractor.

(B) Contractor Invoice Requirements

The Grantee should request disbursement of funds by USTDA to the Contractor for performance of the TA by submitting invoices in accordance with the procedures set forth in the USTDA Mandatory Clauses in Annex II.

7. Effective Date

The effective date of this Grant Agreement ("Effective Date") shall be the date of signature by both parties or, if the parties sign on different dates, the date of the last signature.

8. TA Schedule

(A) TA Completion Date

The completion date for the TA, which is January 31, 2009, is the date by which the parties estimate that the TA will have been completed.

(B) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this Grant Agreement for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

9. USTDA Mandatory Clauses

All contracts funded under this Grant Agreement shall include the USTDA mandatory clauses set forth in Annex II to this Grant Agreement. All subcontracts funded or partially funded with USTDA Grant funds shall include the USTDA mandatory clauses, except for clauses B(1), G, H, I, and J.

10. Use of U.S. Carriers

(A) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(B) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

11. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the TA and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to TA support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

12. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

13. Cooperation Between Parties and Follow-Up

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report (as defined in Clause I of Annex II), the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project.

14. Implementation Letters

To assist the Grantee in the implementation of the TA, USTDA may, from time to time, issue implementation letters that will provide additional information about matters covered by the Grant Agreement. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by the Grant Agreement.

15. Recordkeeping and Audit

The Grantee agrees to maintain books, records, and other documents relating to the TA and the Grant Agreement adequate to demonstrate implementation of its responsibilities under the Grant Agreement, including the selection of contractors, receipt and approval of contract deliverables, and approval or disapproval of contractor invoices for payment by USTDA. Such books, records, and other documents shall be separately maintained for three (3) years after the date of the final disbursement by USTDA. The Grantee shall afford USTDA or its authorized representatives the opportunity at reasonable times to review books, records, and other documents relating to the TA and the Grant Agreement.

16. Representation of Parties

For all purposes relevant to the Grant Agreement, the Government of the United States of America will be represented by the U. S. Ambassador to Host Country or USTDA and Grantee will be represented by the Minister of Education, Research and Youth. The parties hereto may, by written notice, designate additional representatives for all purposes under the Grant Agreement.

17. Addresses of Record for Parties

Any notice, request, document, or other communication submitted by either party to the other under the Grant Agreement shall be in writing or through a wire or electronic medium which produces a tangible record of the transmission, such as a telegram, cable or facsimile, and will be deemed duly given or sent when delivered to such party at the following:

To: Mr. Dumitru Miron
Secretary of State
Ministry of Education, Research and Youth
Str. Gen. Berthelot 28-30
Sector 1, 70738
Bucharest, Romania

Phone: 40-21-405-6211
Fax: 40-21-312-4877
E-mail: dmiron@mec.edu.ro

To: U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

All such communications shall be in English, unless the parties otherwise agree in writing. In addition, the Grantee shall provide the Commercial Section of the U.S. Embassy in Host Country with a copy of each communication sent to USTDA.

Any communication relating to this Grant Agreement shall include the following fiscal data:

Appropriation No.: 117/81001
Activity No.: 2007-81007B
Reservation No.: 2007810029
Grant No.: GH2007810005

18. Termination Clause

Either party may terminate the Grant Agreement by giving the other party thirty (30) days advance written notice. The termination of the Grant Agreement will end any obligations of the parties to provide financial or other resources for the TA, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the written notice of termination.

19. Non-waiver of Rights and Remedies

No delay in exercising any right or remedy accruing to either party in connection with the Grant Agreement shall be construed as a waiver of such right or remedy.

20. U.S. Technology and Equipment

By funding this TA, USTDA seeks to promote the project objectives of the Host Country through the use of U.S. technology, goods, and services. In recognition of this purpose, the Grantee agrees that it will allow U.S. suppliers to compete in the procurement of technology, goods and services needed for Project implementation.

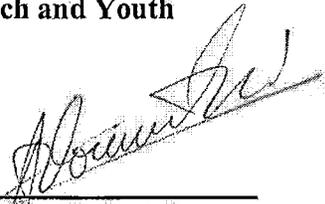
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IN WITNESS WHEREOF, the Government of the United States of America and the Romanian Ministry of Education, Research and Youth, each acting through its duly authorized representative, have caused this Agreement to be signed in the English language in their names and delivered as of the day and year written below. In the event that this Grant Agreement is signed in more than one language, the English language version shall govern.

For the Government of the United States of America

For the Romanian Ministry of Education, Research and Youth

By: 
Nicholas Taubman
Ambassador of the U.S.A. to Romania

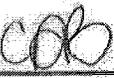
By: 
Cristian Adomnitei
Minister of Education, Research and Youth of Romania

Date: September 24, 2007

Date: September 24, 2007

Witnessed:

Witnessed:

By: 
Cindy Biggs
Commercial Attaché,
Embassy of the U.S.A. in Romania

By: 
Mihaela Suci, Counselor to the
Minister of Education, Research and Youth of Romania

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses

Annex I

Terms of Reference

The Romanian Ministry of Education, Research and Youth ("Grantee") requested technical assistance ("TA") for the development of an Integrated Network for Education and Technologies ("INET") Project. The purpose of the INET Project is to design a program to upgrade existing networks and information technology ("IT") infrastructure at schools, universities and research centers throughout Romania to help develop students' skills to satisfy the growing needs of employers as well as the nation's need for improved innovation. The TA will identify a strategic framework and a broad profile of the IT skills demanded by the private sector in Romania. This framework will help determine the immediate and long-term needs of academic and private sector training programs. The TA will also determine the functionalities of the network to host INET and develop a three-phased implementation plan for INET to support the planned training. The TA will then determine the equipment needed to upgrade and re-equip IT labs and network infrastructures to meet immediate needs of private firms, and the TA will develop specifications for tenders to execute necessary upgrades at IT labs at primary and secondary schools, universities and research centers over the longer term. Finally, the TA will develop a framework for monitoring the developmental impacts of the Grantee's resource allocations for INET.

Towards this end, the Grantee requires the services of a Contractor to complete the following Tasks under this TA. The Contractor shall:

Task I: Develop the Planning Framework

The Contractor shall prepare an Approach Paper conveying the strategic vision of how best to integrate the three networks, which consist of primary and secondary schools, universities and research laboratories. The Approach Paper will assess the macroeconomic level of IT investment justified for investing in technology enhancements to create jobs and growth as planned by the Ministry of Education, Research and Youth as well as the Ministry of Economy and Trade. The Approach Paper will review and report at a minimum on the following:

- (a) International developments in e-learning and resources at U.S. universities, schools, academic and research centers, particularly those leveraging school and university curricula to share research and innovation.
- (b) Data and issues related to enhancing Romania's competitiveness in the Ministry of Economy and Trade's Sectoral Operational Programme, "Increase of Economic Competitiveness" (Draft, April 2006) and EU references therein. The Grantee shall provide the Contractor with a copy of this report.
- (c) Recent developments in education and information and communication technology ("ICT") sectors including plans to reform curricula, introduce knowledge-enhancing networks, and reorganize research focus, etc. under World Bank or European Union (EU) supported initiatives.

- (d) Relevant EU directives and materials related to the i2010 initiatives and e-learning activities in the EU, especially standards, technologies and systems appraised and advanced by the e-Learning Industry Group (www.elig.org).
- (e) Europe versus U.S. comparison by the 2007 EU Spring Council¹ to set the broad investment parameters modernizing networks to meet employment and growth targets;
- (f) Sectors with short-term, medium-term and long-term requirements based on the recent uptake in demand for skills, with respect to jobs and growth targets in the National Development Plan, 2007-13 and EU commitments.
- (g) Use of existing networks for e-learning at IT labs in the schools, universities and research centers in Romania.

Deliverables:

1. The Contractor shall provide an Approach Paper detailing key issues in using knowledge networks and e-learning technologies relevant for Romania. Based on a rapid assessment of existing networks and current e-learning employed in formal education and enterprise training, the Approach Paper will identify the potential for increasing e-learning capacities and network use. The Approach Paper will include an economic analysis justifying the investment level needed to raise Romania's productivity in line with EU targets. The Contractor shall make recommendations for overall investment levels and possible phasing. Each recommendation will be qualified and substantiated based on experience with other successful deployments of infrastructure, learning content, management systems and life-long learning and private e-training arrangements. The Approach Paper will consolidate findings under Tasks I (a) through I (d) above.
2. The Contractor shall develop an Issues Paper for the Grantee's managers and private sector stakeholders identifying issues deemed relevant for joint public-private participatory decision making on the Project's parameters. The Issues Paper will compare and contrast specifically identified needs in Romania with specific solutions at universities, firms and locations in the U.S. to help demonstrate value propositions from network optimization techniques, human resource development strategies and/or e-learning tools and technologies. The Issues Paper will also include a tentative list of U.S. establishments that Romanian academicians, policy and decision makers could visit if there is a future Orientation Visit to assess the TA recommendations and the Project plan.

¹ The Work Foundation, Brinkley, Ian and Lee, Neil: The knowledge economy in Europe – A Report prepared for the 2007 EU Spring Council. It concludes "Europe has developed knowledge based industries comparable in employment terms with the US but has failed to make the underpinning knowledge investment in areas such as R&D, ICT software and higher education"

3. The Contractor shall provide a Strategic Framework document based on the Grantee's review of the Approach Paper and the Issues Paper. The Strategic Framework document will include broad estimates for guiding the investment plan under the Project. The Framework will translate parameters reviewed under Tasks I(d) through I(f) above and based on I(g) into investment guidelines to enable the Grantee initially to identify financing relevant for enhancements under different phases of the Project.

Task II: Develop the Profile of Skill Demands

The Contractor shall develop a profile which includes projections of the knowledge-based employment skills needed in Romania by domestic and international enterprises. The term knowledge-based for the purpose of this Terms of Reference is defined as requiring the use and understanding of ICT applications for business and e-learning purposes. As skills in basic IT use and ICT-related technologies become increasingly important to manage IT assets for employers, these skill demands will include more advanced e-business and IT-enabled operational skills in the future. As these IT skills have become increasingly crucial for global competitiveness, innovation and growth, knowledge-based services have begun experiencing the highest job growth in the EU. Competition across all industries is globalizing, and employers require more skills enabling workers to view the world as one homogenous and networked marketplace to organize supply chains and/or logistics. Workers with increased IT capabilities and skills (called Knowledge Workers) need to interact much more in an IT setting, using e-mails, the web and the relevant IT-enabled operational skills and aptitude sets. These skills are relevant to integrate modern research and development ("R&D") with innovation for enhancing productivity on the job.

The Contractor shall perform the following:

- a. Assess the information on numerous EU e-learning and life-long learning pilot projects available with the National Agency for Qualifications in Higher Education and Partnership with Social and Economic Environment ("ACPART") and assess the lessons learned from their success and failures. The Grantee shall provide the Contractor access to the pilot studies and supporting documentation for the Contractor's review.
- b. Assess the supply of trained graduates to advance job prospects with additional e-learning opportunities in three broad skill categories: (a) basic IT use; (b) ICT technologies; and (c) advanced IT-enabled enterprise operations (including e-business). The Contractor shall work with the Romanian Ministry of Labor, placement offices within the universities, as well as the Vocational Employment and Training Department within the Ministry of Education, Research and Youth to profile the supply of trained graduates and their employment potential in knowledge-based industries.
- c. Assess the demand and profile the demand's quantum, quality characteristics and location in three broad skill categories in the short, medium and long

terms using available data from private enterprises, Human Resource (“HR”) specialists and managers.

- d. Analyze the skill gaps and the projected demand in gap categories using standard industry definitions and projections methodology (e.g., estimates from IDC, Gartner for Cisco, Microsoft etc.) and classifications. This analysis will evaluate gaps between the available skills of job seekers and the opportunities identified. It will identify employment sectors upon which to focus the needed training using e-learning technologies on the networks.
- e. Identify best practice technologies and applications of e-learning to expeditiously train Knowledge Workers, in consultation with U.S. IT firms in Romania and U.S. members of the e-Learning Industry Group Consortium (www.elig.org).
- f. Map the technology suites identified in II (e) above with relevant employment sectors (e.g., energy management, port security, health, finance, etc.) identified in II (d) to assess technology and infrastructure requirements for the needed e-learning programs in Romania.
- g. Conduct a detailed assessment of existing infrastructure at selected locations where network enhancements are contemplated in the immediate and medium terms.

Deliverables:

- (1) A demand analysis of skills and competencies: The Contractor shall prepare a report which will document the supply and demand of three sets of skills and competencies relevant for jobs in the knowledge economy: basic IT skills, skills in managing ICT technologies in the work place and those relevant for IT-enabled operations in globally competitive knowledge based enterprises. The report will identify key e-learning content needed to address the development of skills in the educated workforce, before, during and after employment, taking a life-long learning cycle approach. The report will include at a minimum:
 - a. A descriptive account of skills and competencies: The Contractor shall build upon earlier work, provided by others, or done by ACPART (National Agency for Qualifications in Higher Education and Partnership with the Economic and Social Environment) for EU projects and the National Authority of Sciences in relation to its competitiveness-enhancing mandate. The Contractor shall analyze and document the number of students and unemployed youth that have different quality grades within the three categories or sets of IT-related skills and competencies based on inputs from the Grantee’s Administrator for Public School Curricula. The Contractor shall also present similar data for those being trained by private enterprises. The

combined profile shall be developed as a descriptive account of both the “stock” and “flow” of basic technical and operational IT-enabled skills.

- b. A time and location phasing of skill needs: The Contractor shall present analyses in the form of a report of the timing and location of students, unemployed youth and their potential employers needing the enhanced e-learning networks. The analyses for demand for skills and competencies will establish where and when relevant e-learning and life-long learning content will be delivered using improved networks. The Contractor’s assessment shall present at a minimum demographic and academic data on: (1) Planned enrollment growth and changes in IT-related training plans and curricula; (2) Expressed interest and recruitment plans of international firms; (3) The delays and hurdles in hiring skilled employees; (4) The urgency for training by employers; (5) Need for life-long learning; and (6) Plans for expanding training facilities, etc.

Task III: Develop Network Functionalities and Parameters

Based on Task II recommendations, the Contractor shall evaluate and recommend the preferred Learning and Content Management Systems (“LMS/LCMS”) that form the “content” layer of the targeted modern infrastructure. The Contractor shall then recommend capabilities of the other layers of the Project and the required enhancements. The Contractor shall assess the “service” layer capabilities needed to ensure the managed content is delivered by servers where and when the users want it. The Contractor shall appraise capabilities of the “access” network at selected IT labs and other points of service to enhance in phases based on planning data from Task II and the Project’s Strategic Framework document developed in Task I.

This Task will focus on taking an integrated view of the three network functionalities so that they can function administratively as three Virtual Private Networks (“VPNs”), but be managed physically as one INET and implemented as one INET Project.

The Contractor shall carry out a two-step appraisal of where and when the essential upgrades are justified within the Strategic Framework document developed under Task I.

- a. As the first step, for each point of service on the centralized platform linking the three INET systems, the Contractor shall identify service, access and infrastructure requirements related to the following functionalities:
 - i. skills and competencies management by categories and profiles;
 - ii. learning content and curricula management to deliver categories and sets of skills;
 - iii. learning resources management (including trainers, venues, equipment);
 - iv. trainees’ management, evidence and full tracking including acquired set of

- skills and training history;
- v. key performance indicators related to training efficiency and suitability; and
- vi. data mining capabilities for identifying profiles and patterns in education.

The Contractor shall then assess the existing network services and access nodes/hubs at the research centers, universities and schools (e.g., RoEduNet, Railways, private networks etc.) to establish broad parameters to optimize the network upgrade strategy. The Grantee shall provide the Contractor with the information on the RoEduNet and other applicable private networks.

- b. As the second step, the Contractor shall evaluate network services and access points, especially on the campuses of schools and universities where LMS/LCMS content is required earlier. Based on this evaluation, the Contractor shall map the sequencing of upgrading key network segments to ensure outreach and bandwidth of the existing networks at each potential point of service (i.e., at each university or school campus, phased over time) is maximized and optimized in relation to the following:
 - i. The service, transmission and physical infrastructure layering of the available network at each point of service or network access and existing plans to develop the RoEduNet infrastructure;
 - ii. The reach of IP Protocol/Internet and access – local, national or international -- at each point of service / access and needed connectivity by enterprises; and
 - iii. The pricing of connectivity based on availability (from e-Government networks), through RoEduNet (in collaboration with the National Authority of Scientific Research) or through private providers.

Based on the above information and from surveys under Task II, the Contractor shall decide all other network parameters and requirements to plan for modern access and services with which the established LMS/LCMS can operate to serve the users as planned.

Deliverables:

- 1. A determination of network enhancements required: The Contractor shall document in a report to the Grantee the following evaluations to be considered:
 - a. The location, volumes, quality and plans for e-learning, education and training programs at schools, universities and enterprises by categories and sets of skills to be addressed;
 - b. The profile of e-learning technologies needed under the Project by type of Learning Content Systems (“LCS”) and the Learning Content Management Systems (“LCMS”) capabilities required;
 - c. The key network functionalities (e.g., synchronous, asynchronous,

multimedia or video-enabled distance learning, etc.) needed to enable the selected e-learning technologies to be acceptably accessed and used;

- d. The Contractor shall document the network connectivity and performance related service level requirements at each location in the short, medium and long term; and
- e. The Contractor shall document any implications for reducing start-up costs of enterprise training activities especially in areas like Iasi and Timisoara with higher student population density.

[Note: The Grantee shall make available to the Contractor any specific requirements of enterprises, universities and schools regarding their infrastructure in the form of technical surveys and operating data of existing networks as well as details of plans to enhance or modify them.]

- 2. An inventory of upgrades and enhancements needed: The Contractor shall develop an inventory of upgrades needed by location and targeted users as well as cost of upgrading in the form of a Base Plan to enable the Grantee to select and prioritize the timing of needed upgrades within the Strategic Framework document developed under Task I. The planning data documented in the Base Plan shall include at a minimum:
 - a. Requirements and capabilities of existing infrastructure for different segments (e.g., hubs to points of service) in comparison to those proposed along with estimates of enhancement costs;
 - b. Categories and levels of e-learning programs enabled by each enhancement, additional individual users, and/or enterprise training programs served; other indicators of end-user benefits related to enhancement expenditures;
 - c. Details of existing and enhanced network functioning parameters to enable specifications in Service Level Agreements (“SLAs”) proposed for each point of service under Task IV; and
 - d. Preliminary investment cost estimates for proposed network upgrades, communications, services and applications for each point of service to enable the Grantee to budget for the needed funding.

[Note: The Grantee shall evaluate planning priorities with the Contractor to allow the timed phasing of the Project Implementation Plan, based on the available funding and the e-learning service expansions enabled at each point of service.]

- 3. The INET Project Implementation Plan: The Contractor shall consolidate all relevant data from Tasks I-III above in an INET Project Implementation Plan that provides options to be pursued for each location (school (S), university

(U) or research center (R)) on the basis of each of the three sub-networks (R-INET, U-INET and S-INET) benefiting as a single or clustered points of service:

- a. Content Management and Service Level Options: The Contractor shall document the targeted beneficiaries at each point of service who receive education, job or life-long learning related skills and the relevant content (i.e., e-learning and LCS/LCMS suites) to be provided to deliver the benefits. The specific or shared nature of the content and the services required shall be presented as content management and service level options. The Contractor shall present the costs associated with the relevant applications and network service levels identified with each option evaluated and/or recommended for each point of service.
- b. Network functionality options: The Contractor shall recommend the specific network functionalities to be supported by connectivity, performance and management of the network so that content, services and applications required at each point of service function as planned. The Contractor shall itemize the key requirements under: (1) SLAs; (2) Licenses and vendor support agreement parameters for contracting service and applications layer providers (e.g. LMS/LCMS etc.); and (3) parameters to monitor output based contractual performance of the technology vendor/contractor to be selected.

[Note: The Grantee shall provide the Contractor its planning preferences based on the Project's funding sources or based on potential agreements with private enterprises that may cover any specific point or cluster of service (e.g., three locations within a city or three university/school campuses in a region).]

- c. Network development options: The Contractor shall recommend optimal sequencing or development scenarios for alternatives for phasing and prioritizing different upgrades at each point of service to deliver intended development impact in a timely manner at different points of service in the short, medium and long terms.

The Contractor shall recommend one set of preferred network development options and its associated set of network functionality and content management service level options for each point of service. Based on the acceptance of the recommendations by the Grantee, the Contractor shall prepare tender documents under Task IV.

Task IV: Prepare Tender Documents:

The Contractor shall finalize a standard set of representative technical specifications according to Romanian procurement procedures to help the Grantee specify tenders for different network segments of the development option recommended and accepted

by the Grantee under Task III. These representative specifications shall be sufficient to define key elements of specific contracts funded in the short, medium and long terms by the relevant financiers identified by the Grantee. The Grantee shall provide the Contractor the best indications of sources of financing (e.g., EU, World Bank, Romanian Government, university or private enterprises) so that the tenders developed conform to the relevant/governing procurement rules. The tenders developed will help launch the initial network modifications under the Project and serve as models based upon which the Grantee can develop future tenders for other financiers or public-private partnership ("PPP") arrangements structured later, using the same representative specifications.

The tender documents and specifications shall also enable the Grantee to manage the Project implementation based on results and outputs delivered to the beneficiaries at each point of service. The bidder delivering the required network functionalities with the minimum level of investment from the Grantee would most cost-effectively enhance the infrastructure at the relevant point of service. This mechanism would also be attractive for private enterprises collaborating with the Grantee under separate agreements to furnish training and e-learning at the specific locations. This mechanism would also ensure maximum benefit at the least cost to the Grantee, constituting the fundamental economic rationale for the enhancements for each segment supported by the tender. No other financial analysis is required since the Grantee will not recover revenues at the point of service. The level of matching resources private enterprises bring to share with the Grantee at the point of service will also determine the market sustainability of the investment. Therefore, efficient procurement carried out under the relevant financing agency's acquisition rules would largely ensure the financial justification of the investment.

The Contractor may restructure the phasing of implementation of each network segment, equipment or content after developing the tenders in view of (a) funding for each of the networks; (b) available facilities at each point of service; and/or (c) problems of access and available connectivity that may still remain.

Deliverables:

1. Tender documents: The Contractor shall prepare tenders covering upgrades to serve the needs of at least one-third of the number of users projected in Task II (1) that need skills in the short term. Based on the projected users' specifications and points of service requirements, the Contractor shall develop detailed specifications in representative SLAs for at least a few major urban campus locations of interest to foreign firms intending to hire or train employees. The Contractor in concert with the Grantee and in cooperation with local firms shall determine which urban campus locations will be used; however, a minimum of two sites must be selected. The Contractor shall ensure preparing two tenders each for relevant network segments to be implemented during the short, medium and long terms. Therefore, approximately six to eight tenders should cover key representative technical specifications for enhancing the network to address key categories of demands

(e.g., enterprise training, university / school or life-long learning) and sets of IT skills (e.g., basic IT use, technologies or IT-enabled knowledge-based operations) requiring e-learning applications at points of services serving the six largest areas. Tenders can then be finalized to launch the Project immediately after the completion of this TA, as soon as the Grantee identifies a financier to review and approve the procurement actions.

2. Representative Tender Specifications: The Contractor shall provide at a minimum the following information on the aspects of the tenders (this data should be provided for all points of service in the Procurement Plan, see below) :
 - a. List of works, goods and services to upgrade a network segment;
 - b. Financing information as per procurement requirements of financier;
 - c. Procurement procedures;
 - d. Detailed SLA specifications as performance parameters to monitor for authorizing payments:
 - i. Network availability (e.g., 99.9 percent uptime);
 - ii. Customer requirements (as specified by enterprise or R-INET, U-INET or S-INET requirements)
 - iii. Services at customer premises (as specified);
 - iv. Service activation (times/dates);
 - v. Shared hub station (bandwidth / equipment);
 - vi. Network equipment supplied by service provider (as specified);
 - vii. Network connectivity to each point of service; and
 - viii. Equipment to be provided or arranged for each segment.
 - e. Performance indicators and milestones to monitor output-based payments; and
 - f. Schedule of output-based payments at the delivery of the SLA-specified services.

3. Procurement Plan: The INET Project Implementation Plan will phase in the network services and functionalities required at each different point of service over time. The Contractors shall identify relevant contract packages to be procured using relevant SLA specifications (see above) once financing is secured. A phased Procurement Plan providing broad cost estimates of issuing the remaining tenders to complete the full upgrade of the S-INET, U-INET and R-INET nationally will support the Implementation Plan. The Procurement Plan will map representative specifications with each network segment to be enhanced in the future.

Task V: Development Impact Assessment

The Contractor shall conduct a developmental impact assessment of the INET Project. The main economy-wide development impact will be to enhance the competitiveness of Romania, assessed in terms of jobs and growth as per the EU strategy. This, in turn, depends on efficiently: (a) expanding the networks to enable wider access to knowledge and (b) fostering e-learning to impart new knowledge

economy skills. The Contractor shall develop plans to help the Grantee monitor the development impact of this Project in these two areas as initially planned for under Task I.

The Contractor shall design a preliminary developmental impact analyses framework, in the form of 'Impact Assessment Questionnaires' and relevant 'Analytical Reports' to be derived from questionnaire data. The Grantee or other Romanian Government agencies can use this questionnaire for basic reporting to the EU using standard metrics and indicators assessed during Task I in demonstrating how the Project targets are realized by each successive contract implemented for a point of service.

In consultation with ACPART and the Grantee, the Contractor shall identify key indicators from among such as those advanced by The Maastricht Economic Research Institute on Innovation and Technology ("MERIT") for all EU countries, and present relevant base data to enable the Grantee to monitor the following developmental impact outcomes of the Project, along the following lines:

- **Infrastructure & Human Capacity Development (Network and Skilled Workers):**

The indicators will help the Grantee monitor the industry-required outcome that the available pool of "IT-skilled" workers will increase by 50 percent as result of this Project.

The impact analyses framework will also help monitor how many of those whose skill needs were identified under Task II: (a) were trained for IT specialized career jobs under company-sponsored programs under previous agreements with the Grantee, and/or (b) accessed some network to take advantage of professional development and life-long learning arrangements, and (c) man and operate the INET Project.

The Contractor shall prepare Impact Analyses Questionnaires to collect data to ascertain institutional or enterprise participants' needs and outcomes from the INET Project. Presented to policy-makers and financiers in Analytic Reports before and after implementing a component at any one point of service, these data would quantify the Project's (or components') ability to:

- a. Help the education system to provide employees with necessary IT skills for: (1) a knowledge industry worker (IT-enabled operational skills); (2) business professional (e-business and basic IT skills); (3) IT professional / developer (ICT technology skills); or (4) service sector employee basic IT skills).
- b. Raise the IT skills of inexperienced candidates (school/university graduates) and functionally experienced workers in the areas mentioned above.
- c. Advance (1) the use of technology-based devices; (2) use of applications specific to the entity; (3) use of 'back-office' systems and packages; (4) use of Internet and e-mail; (5) use of standard office applications; and (6) international IT-enabled work.

- d. Help entities raise the IT skills of employees to impact organizational growth by: (1) playing a larger role in deciding the future courses; (2) influencing decisions on business process changes; (3) improving innovation; (4) essentially deciding the competitiveness of the organization; (5) enabling business to be in-sourced or out-sourced.

- Market Oriented Reforms:

In infrastructure: The state, through the National Authority for Scientific Research, partly owns the physical IT infrastructure layer (RoEduNet), on which the transport layer of the network will convey e-learning applications and content. RoEduNet is partly owned by the Railways. The institutional arrangements facilitating its use by the Grantee would go a long way in exploiting the Infrastructure Sharing Framework Agreements typically required of countries by World Trade Organization and international associations furthering open architecture of IT systems. Based on the network assessment under Task III, the Contractor shall indicate the number of SLAs that could benefit from "opening" or deregulating access to the heretofore regulated or "closed" RoEduNet infrastructure for use by private enterprise sponsored training and e-learning. As enhancements to link schools, universities and research centers call for different segments to enter this infrastructure at different points of service, its full opening for this Project implies unrestricted use by INET Project beneficiaries to include private enterprises, albeit on a chargeback basis. This would imply substantial market reforms. Its partial use by INET supported university-industry links, for example, would indicate partial market-oriented reforms.

Education: Already IT firms and other private technology firms are sufficiently interested in collaborating with schools and universities and operating as training partners. Their programs are offering a unique value proposition that is competing away graduates from studying further in schools and universities. Additional interest in attracting internationally acclaimed universities, including those from the U.S., as partners is also growing. There is no indicator needed to monitor this outcome, as their growth will be public knowledge, but to the extent the course offerings can proliferate and allow e-learning to enable international and trans-European linkages, education reforms will be deepened.

- Technology Transfer and Productivity

The Contractor shall identify any potential model for commercializing research in Romania, which could benefit from the INET Project and develop regulatory recommendations to support its operation. One critical enabler of research to further economic growth is the linkage most commonly observed in technology parks all over the world. Such state-sponsored university-industry linkages have helped commercialize MP3 in

Germany, and U.S. universities routinely accept industry problems as the basis of teaching and case materials. Developed by the Fraunhofer System of Germany, this model also helps U.S. firms with testing certification of software (at the University of Maryland, College Park), automobile technologies (at the University of Michigan, Ann Arbor) and through collaborations in bio-medical engineering (at Johns Hopkins University, Baltimore, Maryland).

Deliverable:

Development Impact Assessment Framework: The Contractor shall design and deliver a tested Impact Analyses Questionnaire used to develop data assessed under this task and an initial set presented as base data in the Initial Analytic Report. The Grantee shall use this Initial Analytic Report as base data to report the Project's development impact during and after implementation to its financiers and government policy makers.

Task VI: Prepare Final Report

The Contractor shall prepare and provide to the Grantee and to USTDA a Final Report in accordance with Clause I of Annex II of the Grant Agreement. Descriptions of all of the work performed pursuant to each of the above tasks in this Terms of Reference must be distinctly set forth in the Final Report in a substantive and comprehensive manner, and shall include all deliverables that have been provided to the Grantee. The Final Report shall contain an executive summary, and shall identify prospective U.S. Sources of Supply in accordance with Clause I of Annex II of the Grant Agreement. In addition to any other required deliverables in accordance with Clause I of Annex II of the Grant Agreement, the Contractor shall provide both the Grantee and USTDA with a Public Version of the Final Report on CD-ROM. The CD-ROM version of the Final Report shall include:

- Adobe Acrobat readable copies of all documents;
- Source files for all drawings in AutoCAD or Visio format; and
- Source files for all documents in MS Office 2000 or later formats (note: these files may be provided in equivalent readable formats).

Notes:

- (1) **The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.**
- (2) **The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.**
- (3) **The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.**

Annex II

USTDA Mandatory Contract Clauses

A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in whole or in part by the U.S. Trade and Development Agency ("USTDA") under the Grant Agreement between the Government of the United States of America acting through USTDA and the Romanian Ministry of Education, Research and Youth ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the Technical Assistance ("TA") for the Integrated Network for Education and Technologies project ("Project") in Romania ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and J. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

B. USTDA as Financier

(1) USTDA Approval of Contract

All contracts funded under the Grant Agreement, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing in order to be effective with respect to the expenditure of USTDA Grant funds. USTDA will not authorize the disbursement of USTDA Grant funds until the contract has been formally approved by USTDA or until the contract conforms to modifications required by USTDA during the contract review process.

(2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the TA and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or

liability to such parties. Any approval or failure to approve by USTDA shall not bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

C. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the TA and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to TA support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

D. Recordkeeping and Audit

The Contractor and subcontractors funded under the Grant Agreement shall maintain, in accordance with generally accepted accounting procedures, books, records, and other documents, sufficient to reflect properly all transactions under or in connection with the contract. These books, records, and other documents shall clearly identify and track the use and expenditure of USTDA funds, separately from other funding sources. Such books, records, and documents shall be maintained during the contract term and for a period of three (3) years after final disbursement by USTDA. The Contractor and subcontractors shall afford USTDA, or its authorized representatives, the opportunity at reasonable times for inspection and audit of such books, records, and other documentation.

E. U.S. Carriers

(1) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(2) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

F. Workman's Compensation Insurance

The Contractor shall provide adequate Workman's Compensation Insurance coverage for work performed under this Contract.

G. Reporting Requirements

The Contractor shall advise USTDA by letter as to the status of the Project on March 1st annually for a period of two (2) years after completion of the TA. In addition, if at any time the Contractor receives follow-on work from the Client, the Contractor shall so notify USTDA and designate the Contractor's contact point including name, telephone, and fax number. Since this information may be made publicly available by USTDA, any information which is confidential shall be designated as such by the Contractor and provided separately to USTDA. USTDA will maintain the confidentiality of such information in accordance with applicable law.

H. Disbursement Procedures

(1) USTDA Approval of Contract

Disbursement of Grant funds will be made only after USTDA approval of this contract. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor a photocopy of an English language version of a signed contract or a final negotiated draft version to the attention of the General Counsel's office at USTDA's address listed in Clause M below.

(2) Payment Schedule Requirements

A payment schedule for disbursement of Grant funds to the Contractor shall be included in this Contract. Such payment schedule must conform to the following USTDA requirements: (1) up to twenty percent (20%) of the total USTDA Grant amount may be used as an advance payment; (2) all other payments, with the exception of the final payment, shall be based upon contract performance milestones; and (3) the final payment may be no less than fifteen percent (15%) of the total USTDA Grant amount, payable upon receipt by USTDA of an approved Final Report in accordance with the specifications and quantities set forth in Clause I below. Invoicing procedures for all payments are described below.

(3) Contractor Invoice Requirements

USTDA will make all disbursements of USTDA Grant funds directly to the Contractor. The Contractor must provide USTDA with an ACH Vendor Enrollment Form (available from USTDA) with the first invoice. The Client shall request disbursement of funds by USTDA to the Contractor for performance of the contract by submitting the following to USTDA:

(a) Contractor's Invoice

The Contractor's invoice shall include reference to an item listed in the Contract payment schedule, the requested payment amount, and an appropriate certification by the Contractor, as follows:

(i) For an advance payment (if any):

"As a condition for this advance payment, which is an advance against future TA costs, the Contractor certifies that it will perform all work in accordance with the terms of its Contract with the Client. To the extent that the Contractor does not comply with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA. "

(ii) For contract performance milestone payments:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(iii) For final payment:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. Specifically, the Contractor has submitted the Final Report to the Client, as required by the Contract, and received the Client's approval of the Final Report. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(b) Client's Approval of the Contractor's Invoice

(i) The invoice for an advance payment must be approved in writing by the Client.

(ii) For contract performance milestone payments, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and the terms and conditions of the USTDA Grant Agreement."

(iii) For final payment, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client. "

(c) USTDA Address for Disbursement Requests

Requests for disbursement shall be submitted by courier or mail to the attention of the Finance Department at USTDA's address listed in Clause M below.

(4) Termination

In the event that the Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for reasonable and documented costs which have been incurred in performing the Terms of Reference prior to termination, as well as reasonable wind down expenses. Reimbursement for such costs shall not exceed the total amount of undisbursed Grant funds. Likewise, in the event of such termination, USTDA is entitled to receive from the Contractor all USTDA Grant funds previously disbursed to the Contractor (including but not limited to advance payments) which exceed the reasonable and documented costs incurred in performing the Terms of Reference prior to termination.

I. USTDA Final Report

(1) Definition

"Final Report" shall mean the Final Report described in the attached Annex I Terms of Reference or, if no such "Final Report" is described therein, "Final Report" shall mean a substantive and comprehensive report of work performed in accordance with the attached Annex I Terms of Reference, including any documents delivered to the Client.

(2) Final Report Submission Requirements

The Contractor shall provide the following to USTDA:

(a) One (1) complete version of the Final Report for USTDA's records. This version shall have been approved by the Client in writing and must be in the English language. It is the responsibility of the Contractor to ensure that confidential information, if any, contained in this version be clearly marked. USTDA will maintain the confidentiality of such information in accordance with applicable law.

and

(b) Three (3) copies of the Final Report suitable for public distribution ("Public Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version (provided USTDA receives a total of four (4) copies). In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

The Contractor shall also provide one (1) copy of the Public Version of the Final Report to the Foreign Commercial Service Officer or the Economic Section of the U.S. Embassy in Host Country for informational purposes.

(3) Final Report Presentation

All Final Reports submitted to USTDA must be paginated and include the following:

(a) The front cover of every Final Report shall contain the name of the Client, the name of the Contractor who prepared the report, a report title, USTDA's logo, USTDA's mailing and delivery addresses, and the following disclaimer:

"This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. Government. The opinions, findings, conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report."

(b) The inside front cover of every Final Report shall contain USTDA's logo, USTDA's mailing and delivery addresses, and USTDA's mission statement. Camera-ready copy of USTDA Final Report specifications will be available from USTDA upon request.

(c) The Contractor and any subcontractor that performs work pursuant to the Grant Agreement must be clearly identified in the Final Report. Business name,

point of contact, address, telephone and fax numbers shall be included for Contractor and each subcontractor.

(d) The Final Report, while aiming at optimum specifications and characteristics for the Project, shall identify the availability of prospective U.S. sources of supply. Business name, point of contact, address, telephone and fax numbers shall be included for each commercial source.

(e) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by the Client to this effect provided on or with the invoice for final payment will meet this requirement.

J. Modifications

All changes, modifications, assignments or amendments to this contract, including the appendices, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

K. TA Schedule

(1) TA Completion Date

The completion date for the TA, which is January 31, 2009, is the date by which the parties estimate that the TA will have been completed.

(2) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this contract for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

L. Business Practices

The Contractor agrees not to pay, promise to pay, or authorize the payment of any money or anything of value, directly or indirectly, to any person (whether a governmental official or private individual) for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the TA. The Client agrees not to receive any such payment. The Contractor and the Client agree that each will require that any agent or representative hired to represent them in connection with the TA will comply with this paragraph and all laws which apply to activities and obligations of each party under this Contract, including but not limited to those laws and obligations dealing with improper payments as described above.

M. USTDA Address and Fiscal Data

Any communication with USTDA regarding this Contract shall be sent to the following address and include the fiscal data listed below:

U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

Fiscal Data:

Appropriation No.: 117/81001
Activity No.: 2007-81007B
Reservation No.: 2007810029
Grant No.: GH2007810005

N. Definitions

All capitalized terms not otherwise defined herein shall have the meaning set forth in the Grant Agreement.

O. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Client nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.