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E-training of Small and Medium Agribusiness Enterprises

by

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Abstract

This study describes the design and development of a web-based electronic training system aiming at business operations of small and medium-sized agribusiness enterprises (SMAEs). The proposed system will meet current and future needs of SMAEs for timely, accurate, and customised training removing the barriers of geographical solitude and economies of scale. The objectives of this system are: (a) to offer training and consultancy to SMAEs on how to use information and communication technologies as business tools in order to improve their operations and gain competitive advantage (b) to provide education material customised to the special needs of each SMAE, (c) to provide on-line training, advice and consultancy using special-trained operators, and (d) to provide on-line training, advice and consultancy by skilled operators who have been trained to offer those services. ETS will be an Internet-based system. The system will operate as a third-party trusted intermediate between SMAEs, consultants, and content providers. The system design will be extended to cover the needs of the programme "Training support for Go-Digital Project" funded by Greek Ministry of Development which aims to offer training and support in the usage of Internet services to 50.000 SMEs.

Keywords: E-training, E-business, Small and Medium Enterprises, Agribusiness, Brokerage Service.

1. Introduction

Information and Communication Technologies (ICTs) have changed rapidly the way we work and communicate, resulting in a profound evolution of the bases of economic competition. ICTs constitute a tool for the modernisation of the state and the competitiveness of enterprises, while creating new ways of work, new skills, and the need for continuing learning and adaptation of the education system. In particular, electronic commerce technology offers entrepreneurs new business opportunities. It has enormous potential to open up new opportunities for local Small and Medium-sized Enterprises (SMEs), bringing economic prosperity to communities which, until now, have been confined to the periphery of potential lucrative global and regional markets (ITU, 2000). E-business is often described as the SMEs' gateway to global business and markets. These opportunities are not always easy to grasp. On average, only 42% of European SMEs have access to the Internet. In some European Union (EU) Member States, this is even less than the Internet penetration among households. Only 20% of SMEs use the Internet for commercial transactions.

In a recent survey on the use of Personal Computers (PC), Internet and mobile telephony in Greece, which was carried out by GRNET S.A. (www.grnet.gr) between

December 2001 up to January 2002, the following results were drawn (Karounos and Gousiou, 2002):

1. The areas of education and SMEs have been identified as critical importance for the development of the competitiveness of the country.
2. According to the latest figures, the 39% of Greek SMEs are of one person and only 24% of them have a PC and 10% Internet access. 95% of SMEs have 1-5 personnel and 14% of them have Internet access. The main barrier of ICT adoption was lack of knowledge. Consequently, the area of education / training / consultancy was of the greatest importance for Greek SMEs. This finding was in line with a European survey on Family Business Training for XXIst Century (Alvarez, 2002).
3. There is significant divergence in the relevant penetration rates between the very small enterprises (1–5 employees) and the larger ones.

Other findings regarding ICT/Internet usage include:

4. Internet penetration rate surpassed 10% of the population (over 15 years of age) for the first time at the end of the first half of 2001, while it is expected to exceed 12% by the end of the same year.
5. During the first half of 2001, Internet penetration in Greece increased by 3% (from 7.3% in 2000). This is due to the significant acceleration of the users-yearly growth rate, which for 2001 is estimated to surpass 60%, from 38% for the previous year.
6. Penetration rates show significant differences amongst different population segments as delimited by age, level of income, level of education, sector of employment, etc. In addition, there are significant regional differences of the center – periphery type as well as of the urban – rural type.
7. The level of education is an important influential factor for PC and Internet use (one out of two individuals with higher education level uses PC, while the corresponding ratio for those with only fundamental education is one out of 50).
8. The particularly high proportion of the population with a lower level of education (37%), of which 86% also falls in age group of over 45 years old, forms a structural suspending factor for the fast development of Internet in Greece. It becomes evident that an improvement of the level of education may decrease the digital divide.
9. Despite the significant progress underway, Greece is still far behind the mean penetration rates of the EU for PC and Internet use. However, mobile telephony penetration rate is satisfactory compared with rest of Europe, as it approaches the mean EU rate.
10. If growth rates are maintained at the 2001 level, then it is estimated that by the end of 2004 Internet penetration in Greece will reach 50%, compared with an estimated 66% EU average for the same year, which is an indication of convergence in this area. It is worth noting, that if the 3G mobile telephony develops as dynamically as projected during the same period (WAP), then a full convergence of the penetration rates may be achievable.

Advances in ICT and specifically in multimedia, networking, and software engineering, promote the apparition of a new generation of computer-based training systems (Vlachos, 2002a). Internet is today a ubiquitous supporting environment for

virtual and distributed learning environments. As a consequence, many institutions take advantage of new technologies to offer training products and services at all levels using World Wide Web (Anido et al., 2001; Leung and Li, 2001; Vlachos, 2002b).

The agricultural sector in Greece holds a significant position in the national economy and society in general. It contributes 12% to the gross domestic product (GDP) and over 30% of the country's total exports value. In the United States, it is estimated that 14% of commerce in agriculture, forestry, and fishing industries will be online by 2005 (Wilson, 2001). The Greek agricultural industry has begun to recognize the importance of e-business but it needs to develop skills in using Internet and electronic commerce in its business transactions. In this context, the present paper indicates a model for the design of a Web-based Electronic Training System (ETS) of Greek Small and Medium-sized Agribusiness Enterprises (SMAEs). The aim of the proposed system is (a) to inform and guide SMAEs in ICT, e-business and new business practices, (b) to develop skills to SMAEs in using Internet and electronic commerce in the daily operations, (c) to provide specialized, certified and quality education material customised to the special needs of each SMAE, (d) to provide on-line training, advice and consultancy by skilled operators (consultants) who have been trained to offer those services. ETS will be an Internet-based system.

2. ETS Description

The Internet contains a wealth of information about ICT, e-business and new business practices in the agricultural industry, but because this is not presented in a systematic way there may be difficulty for SMAEs in finding authoritative and relative information quickly as well as in taking a Web-based training course (Costopoulou and Daliani, 2000). Another obstacle is the language. In this context, the proposed system tries to provide specialized, certified and quality Internet-based training courses in Greek. It supports off-line and on-line distance learning. More specifically, ETS is focusing on the design of information brokerage service architecture to permit the efficient provision of Internet-based training services to SMAEs. It describes an information brokerage service, which facilitates the matching process of the demand (by SMAEs) and supply (by e.g. consultants) for training services. The ETS participants are: (a) SMAEs (e.g. producers, agricultural co-operatives, agribusiness, food companies) who are interested in getting training and support, and (b) educational staff or consultants who wish to provide training.

The consultants of ETS will complete a Web-based form including information such as : (a) personal and educational information (e.g. first name, surname, phone number, e-mail, education background), (b) subjects which they wish to provide training, and (c) date and time availability. The SMAEs will complete a Web-based form including information such as: (a) contact information (e.g. contact person, surname, address, phone number, e-mail), (b) information about the enterprise's hardware, software and type of the Internet connection, (c) way of reception of the educational material (e-mail or by post), and (d) date and time availability for on-line distance learning.

3. ETS Model

A number of research projects have been developed relevant to the electronic brokerage services. Brokerage services address the need of both, users and content providers, as they facilitate the conjunction between the demand of users and the offer supplied by the content providers (ACTS, 1998). Hence the main challenges in information brokerage service are:

- To create and maintain a structured internal representation of the heterogeneous, both in access and used data formats, dynamic and large provider domain, in order to enable the matching of the demand and supply processes. This requires knowledge representation and capture of (a) subjects, concepts and relations between them in the particular domain, which is the subject of the brokerage service, (b) content provider and their coverage of the subjects and concepts, and (c) actual contents and offers from each provider.
- To enable users the appropriate view and access to the provider domain and the offers, and enable content provider to propagate their offers towards end-users, by an offer registration mechanism.

Some key projects addressing this topic are: Architecture for Information Brokerage Service (ABS), Object Framework for Electronic Requisitioning (OFFER), and Generic Architecture for Information Availability (GAIA). The proposed ETS framework is created by populating the generic ABS information brokerage framework (ACTS, 1998; Costopoulou and Lambrou, 2000). The ETS model consists of five main categories of actors:

- The *ETS user* is an entity using the system to satisfy his/her own requirements (i.e. get or provide training).
- The *ETS brokerage service provider* is an entity that offers information services or contents to users from other actors. This actor can be the Informatics Laboratory of the Agricultural University of Athens (AUA) or an information company.
- The *ETS content provider* is an entity that offers training services (e.g. educational material, on-line courses) and information about the educational staff or consultants to users by means of the brokerage service. This actor includes AUA, agricultural educational/research institutes, business institutes etc.
- The *electronic service provider* is an entity that provides telecommunication, information or application services (i.e. off-line and on-line courses). This actor can be the Informatics Laboratory of the AUA or an information company.
- The *network provider* is an entity (e.g. OTEnet, Forthnet, HellasOnline) that provides all necessary networking functions to the other actors.

The requirements of the actors with respect to the ETS brokerage service are as follows:

- *Presentation* requirements concerning the presentation of SMAE's demand and the off-line and on-line services.
- *Access* requirements concerning access to information (speed, reliability, efficiency).
- *Quality* requirements concerning the availability, reliability and quality of offered information.
- *Security* requirements concerning all security aspects (authentication, integrity etc).

The following processes are also considered to be essential for the ETS brokerage service (Fig. 1):

Meta-catalogue representation. The meta-catalogue is responsible for maintaining meta-information for the information sources in the ETS content provider domain. It forms the knowledge base of the Internet-based ETS and is absolutely necessary since it facilitates the mapping between demand and supply, and provides the appropriate classification mechanism. Each entry in the meta-catalogue is called a resource. A resource is a composed entity, encapsulating informational items from the ETS content providers domain, kept and maintained by the ETS brokerage.

User request processing. The proposed system has to handle user requests where the main steps are: (1) to adapt the user request to the appropriate format in order to access the meta-catalogue resources, (2) to identify the appropriate resources and/or content provider resources related to the request (3) to access the content providers resources if needed, and (4) to retrieve the actual resources, prepare, and present the results in an appropriate manner to the user side.

Offer registration/processing. When a content provider is connected to the system, he provides a formal description of his contents through an operation called offer registration. Resources supplied by Content Providers include structured data for those SMAEs and consultants registered within the system as well as educational material.

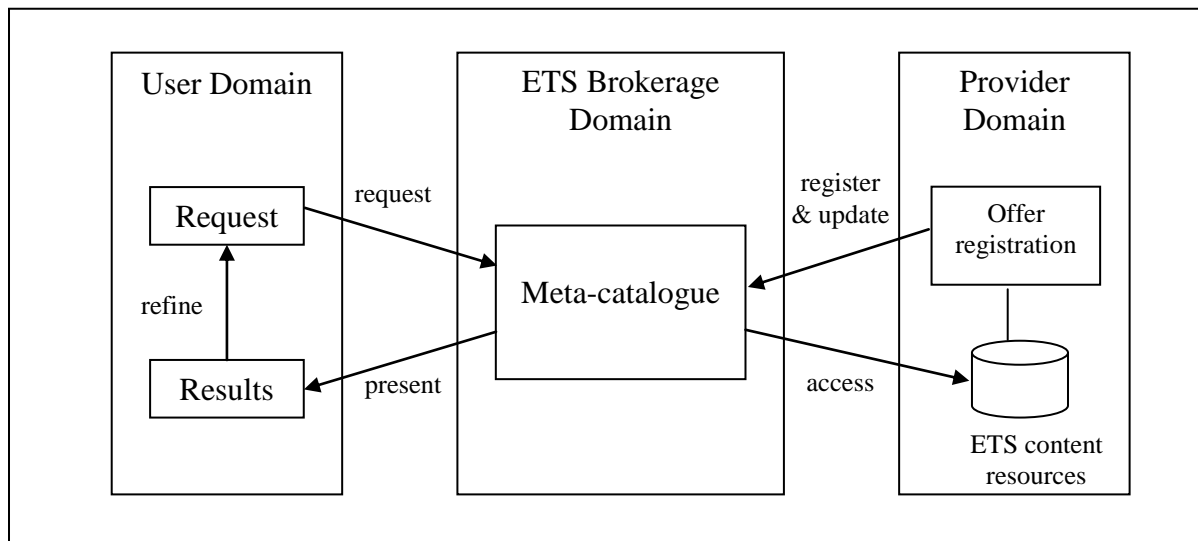


Fig. 1. Main information processing.

4. ETS Evaluation: a Case Study

The evaluation of ETS will be achieved by the participating SMAEs in the “Training Support of the programme Go-Digital in the Peloponnese Region”. The Informatics Laboratory of the AUA is the coordinator of a consortium which has undertaken the task of training the SMEs. Members of the consortium are the chambers of commerce in Arkadia, Argolida, Korinthos, Messinia and Lakonia, and a private company. In particular, the “Go-Digital” initiative aims at familiarizing 50,000 Greek SMEs with

ICT, by providing them the necessary tools and the knowledge in order to enhance their business operations. It is part of the Enterprising Programme "Information Society" (measure 3.2, 3rd Community Support Framework of the European Union). The GRNET S.A. is responsible for materializing the Training Support of the programme Go-Digital, in the context of the Enterprising Programme "Competitiveness" of the Ministry of Development. The Training Support provides to the eligible SMEs for funding free training and support in the usage of the Internet services. More specifically, the Training Support includes the following activities:

1. The support of entrepreneurs and employees of the SMEs that participate in the Programme by appropriately prepared Consultants of Support & Guidance (CSG).
2. The creation of a portal for the provision of consulting and support services via the Internet.
3. The development of educational material.
4. The operation of a Help Desk office.

Table 1 presents the subjects for which SMEs can receive training and support at the first stage of operation of the e-training model. Educational modules include topics on agribusiness management, e-business, entrepreneurship, and agriculture-related subjects such as food quality assurance and HACCP (Hazard Analysis Control Critical Point).

Achieving Organizational Goals Through Planning and Implementation	Become a More Effective Supervisor
Breakthrough Business Thinking	Business Writing for Results
Coaching Skills for Managers and Supervisors	Communication Skills for the Technical Professional
Conflict Management & Confrontation Skills	Creative Problem Solving and Decision-making
Deliver Exceptional Customer Service	Delivering Effective, Persuasive Presentations
Develop and Administer a Budget	E-Commerce for food and beverages
Finance & Accounting for Non-Financial People	Give Exceptional Customer Service
HACCP - ISO	Implementing Self-Directed Work Teams
Interpersonal Communication Skills for Business Professionals	Lead a Team
Maintain and Organize Files and Records	Making Meetings Produce
Manage and Organize Accounts Payable	Manage Multiple Projects and Meet Deadlines
Quality safety and assurance	Management Skills for Secretaries, Administrative Assistants and Support Staff
Project Management	Recruiting, Interviewing and Hiring
Team Building and Coaching	Team Communication Tactics
Traits of Highly Successful Work Teams	Transform Marginal Employees Into Solid Performers

Table 1: E-training content

5. Conclusions

SMEs are increasingly becoming aware of the potential usage of ICT and their necessity in achieving competitive advantage in the information society. SMEs can gain from e-training, e-advice, and consultancy about managerial, business, and technology issues enabled by the implementation and usage of the ETS model. In particular, ETS will offer the relative advantages of low cost, customisation of content, specialisation of educational programme, distance learning and remote support and continuous improvement of business operations.

The present paper presents an initial approach for an ETS model, which can support educational support of Greek SMAEs using a brokerage service. Furthermore, the system will be enriched with a number of services (such as on-line news for each agricultural sector, forum or chat rooms, and links with relevant educational institutions and organizations) in order to constitute a vertical portal (vortal) in agribusiness. In this direction, the ETS model will advantage of other Greek educational initiatives such as the “Entrepreneur project” in AUA (EPEAEK 3.2.1b) that includes developing educational material suitable for e-training.

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