Supporting Sustainable Agriculture in Greece Through a Web-Based Information Center

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Abstract
Due to increasing acceptance and interest for sustainable agriculture in Greece, an Information and Communication Infrastructure is required to support further development of sustainable agriculture and to promote the transition from traditional to organic farming. In this paper we present an ongoing research and development effort to design and develop a web-based information center (web portal) that primarily aims to support the communication and information needs of the various players playing some role in the development of sustainable agriculture in Greece.

Keywords: *Internet Portal design, sustainable agriculture, organic farming.*

INTRODUCTION

Agriculture has changed dramatically, due to new technologies, mechanization, increased chemical use, over-specialization and governmental policies that favoured maximizing production. Although these changes have had many positive effects and reduced many risks in farming, there have also been significant costs. Most important among these are topsoil depletion, groundwater contamination, the decline of family farms, increasing costs of production, and the disintegration of economic and social conditions in rural communities.

A growing movement has emerged during the past two decades to question the role of the agricultural policies, which promote practices that contribute to these problems. Today, this movement for sustainable agriculture is gaining increasing support and acceptance within mainstream agriculture. Not only does sustainable agriculture address many environmental and social concerns, but also it offers innovative and economically viable opportunities for growers, labourers, consumers, policymakers and many others in the entire eco-system. In general, sustainable agriculture integrates two main goals: environmental health, while maintaining economic profitability, and social stability.

In this paper we present an ongoing research and development effort to design and develop a web-based information center that primarily aims to support the development and expansion of organic farming and sustainable agriculture in Greece. Organic farming in Greece is still in its infancy, but there is an increasing interest and also governmental support mainly driven by European policies. Our main motivation behind the development of a central information and communication point for organic farming is first to provide easy access to information about sustainable agriculture and, second to bring together the different players playing different roles in what can be seen as a larger eco-system. These basic objectives are driven by our belief that *reaching toward the goal of sustainable agriculture is the responsibility of all participants in the agricultural system*, including farmers, labourers, policy makers, researchers, extensionists, retailers, and consumers. Each group has its own role to play, its own unique contribution to make to strengthen the sustainable agriculture community.

For example, consumers can play a critical role in creating a sustainable food system. Through their purchases, they could send clear and strong messages to producers, retailers and others in the system, about what they consider important (e.g. quality of agricultural products). Food cost and nutritional quality have always influenced consumer choices. The challenge now is to find strategies that broaden consumer perspectives, so that

environmental quality, resource use, and social equity issues are also considered in shopping decisions. Extensionists and researchers should put their efforts to support farmers in making the transition from traditional to organic farming. At the same time, new policies, institutions and methods must be created to enable producers using sustainable practices to market their goods to a wider public.

The short description above reveals that the development of sustainable agriculture is a complex process involving multiple tasks and multiple players. Building an IT infrastructure to support this complex process is a challenge that requires a multi-disciplinary approach.

From an IT perspective, the challenge that we faced was how to organise the information center in order to make it more effective and easier to achieve the main goal of promoting organic farming and sustainable agriculture. A web-based portal approach was selected, because portals can serve both communication and information seeking needs (Shiefer, 2003). Additionally, portals are one of the most familiar methods of accessing and retrieving information from the Internet. Most of the users of the Internet use portals in a daily fashion. This observation was a key element in taking the decision to use a portal approach, which could serve communication, information and other needs both vertically and horizontally. In the rest of this paper we describe the process of designing the "sustainable agriculture" portal. The portal is accessible in the address *aeiforia.farm.teithe.gr*.

DESCRIPTION OF THE SYSTEM

Given these observations and ideas described in the previous Section, in the design of the web-based portal we tried to follow a user-centered approach by putting at the centre of our requirements analysis the different groups playing some role in sustainable agriculture. Our effort was to organise information in such a way that will make it easily accessible to each category of the participants in the sustainable agriculture community. Besides this vertical organisation we also put efforts to identify different aspects each playing some role in the adoption and development of sustainable agriculture (e.g. legislation for producers of organic products, information about formal and informal training in organic farming, software to support organic farming, etc). This scheme resembles a horizontal organisation, which could help users of our portal to identify and retrieve relevant information about specific needs.

Another important aspect of the web-based system is to support farmers making the transition to organic farming. This objective is based on our view that *making the transition to sustainable agriculture is a process, which should be carefully organised*. This particular part of the portal provides careful guidance and useful information to assist farmers towards the transition from traditional to organic farming. To serve this goal, a specific section of the portal includes several case studies that present real-world examples of successful organic farming.

Very important elements of the portal are the services that it provides to serve the communication between the users of various profiles. The first service is the forum service that can be used by everyone to participate in discussions about specific subjects. Every user can initiate a discussion and other users of the systems can exchange opinions in various subjects. Access to the forum service is provided upon subscription to the portal and the administrator of the portal can suspend use of forum to particular users. The second communication service is the mailing lists. Users who are registered in the portal can select one or more mailing lists to participate. A general mailing list exists for general-purpose communication, while other more specific lists serve more specific needs (e.g. mailing list for consumers, etc.).

Another large part of the web portal is dedicated for information seeking. Information needs are categorised in various main subjects (e.g. Financial & economic issues, Organic Farming Products, Laws – regulations, Certification) and separate predetermined links were developed to provide access to various resources about these identified subjects. Also, a significant section of the portal has information for extensionists and farmers for training purposes.

Furthermore, another very useful service of the portal is its thematic catalogue. Using this catalogue other web sites about sustainable agriculture have been organized thematically. Using a web spider tool the Greek web domain (*.gr) was crawled to identify web sites and other personal web pages devoted to sustainable agriculture. These resources were collected and evaluated by a team of trained users that have finally decided the thematic organization of identified and selected resources. Table 1 presents the communication, information and other services, which are available in our portal.

Table 1: Overview of the various services and resources offered in the portal.

Aspects	**Different Roles**						
		Farmers	Retailers	Consumers	Extensionists	Policy makers	Researchers
Communication needs	Forum	All the players can use the forum service.					
	Mailing list	Different mailing lists for each player – common mailing list for everyone.					
Information needs	Financial and economic issues	Resources about economic issues (mostly for farmers and policy makers).					
	Information about organic farming products	Resources for products (mostly for consumers and researchers).					
	Laws – regulations	Resources primarily for policy makers.					
	Certification	Information about product certification (resources mainly for policy makers, farmers, consumers).					
	Dictionary of terms	A dictionary about sustainable agriculture.					
	How-to	How-to list for quick reference by everyone.					
Commerce	A virtual market place to assist commerce of organic products. Useful for farmers and consumers.						
Thematic catalogue	A thematic catalogue to organise other web sites and Internet resources about sustainable agriculture.						
Training	This section has resources mainly for extensionists and farmers for training in organic farming and other sustainable agriculture issues.						
Case studies	A set of case studies illustrating the transition from traditional to organic farming.						

Probably the most important service in our portal is the virtual market place. We have developed this service because we believe that direct marketing of agricultural products through virtual Internet-based market places could provide an additional capability to small farmers, traditionally selling their products using direct marketing techniques such as roadside stands or local farmers' markets (Ball and Duval, 2001; Offer, 2001). Direct marketing is also well appreciated by customers, since they believe that through direct marketing they can buy fresh products in fair prices. Figure 1 illustrates a snapshot of the virtual market place provided in our web portal.

Through this part of the portal, farmers of organic products and retailers can offer their products directly to consumers. The aim of the market place service is to facilitate contact between consumers and farmers. The consumers can select specific product category and browse all the products, which are available in the category specified. For each product, consumers can see the details of the provider (farmer or retailer) and they can contact them to purchase their products. Farmers or retailers must contact the administrator of the portal before they can offer their products in the virtual market place. This process was considered necessary to assure proper use of the market place.

DISCUSSION AND CONCLUSION

The portal has only been released for few weeks now and has not yet attracted many visits. Clearly some time is required before it could attract some attention from the members of the agricultural community. Also, like any other web site, a web marketing approach is required to increase the number of people using the portal. No

doubt, our effort is still in the beginning and many other steps are required before we can draw some conclusions about the use and the success of the IT infrastructure we have designed.

We expect that the design of the portal will allow the different players in the sustainable agriculture community to communicate with each other and also to retrieve relevant information in an effective and efficient manner. We also envisage that part of the portal (i.e. Case studies, How-to) will assist traditional farmers who would like to be involved in organic farming, but they find difficulties in identifying the steps towards a successful transition from traditional to organic farming. Finally, the virtual market place will provide us an environment to examine and evaluate the use of new e-commerce methods in selling organic farming products in comparison to more traditional methods of selling agricultural products.

Nonetheless, we consider the effort described in this paper as a first step towards the realisation of an IT infrastructure that will play some role in the development of sustainable agriculture in Greece.

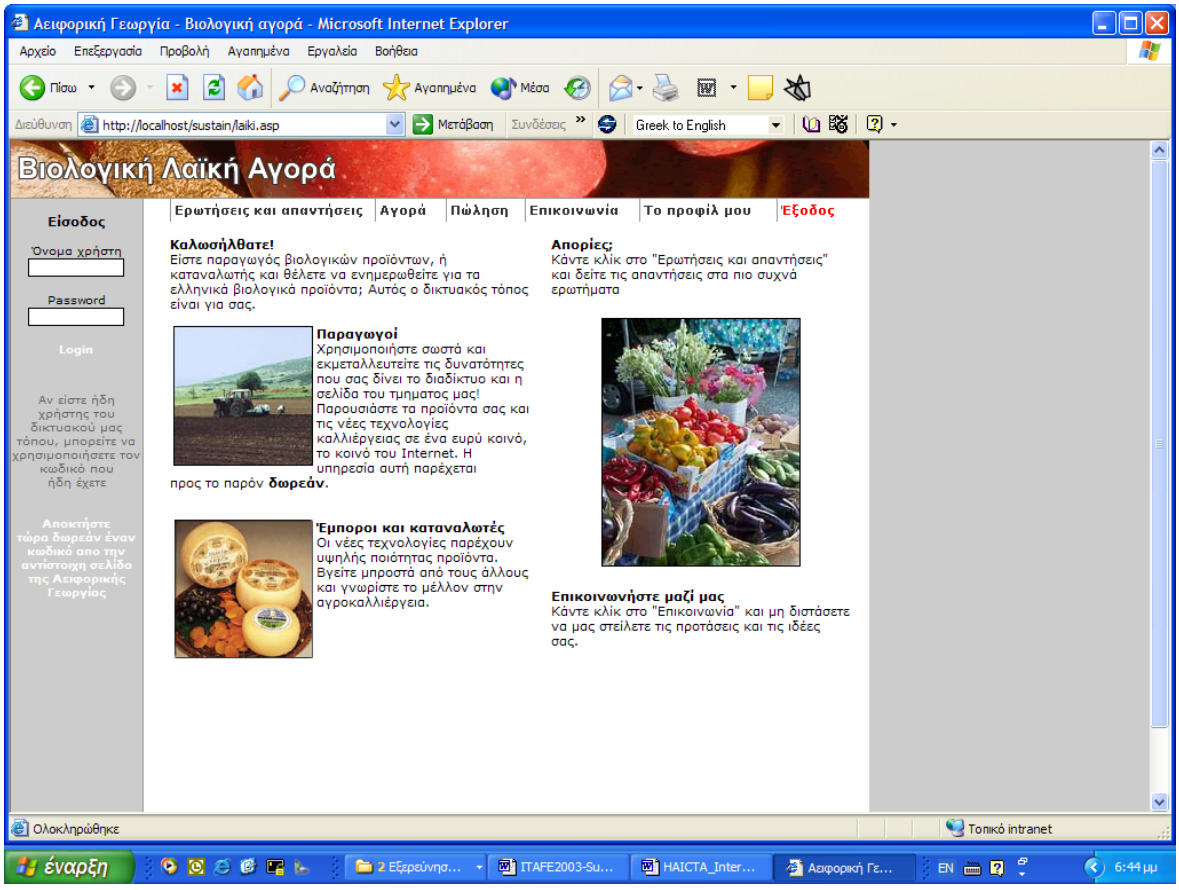

Figure 1: The first page of the virtual marketplace for organic products

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