Adoption of IT for Extension Services in Developing Countries: Practice and Experience from the Albanian Case

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ABSTRACT

It seems the expectations that Information Technology (IT) could be adopted widely and rapidly by farmers and extensionists have slightly cooled recently. There is a wide range of possible explanations for the slow adoption rate. This paper discusses the adoption rate of Information Technology (IT) by extension services in a developing country such as Albania. We report practices and experiences from an ongoing research and development programme which is financially supported by the European Union (EU). One of the main objectives of this programme is to increase IT adoption rates and to set up information centers for "one stop" information shopping in different areas of Albania. Since this programme involves the largest public agricultural organisations (ministry of agriculture and food), the largest private associations in Albania as well as academia, we believe that experiences and practices reported here may be very useful to other researchers or extensionists.

INTRODUCTION

The important role and potential of Information Technology (IT) for providing agricultural services in developed countries has been extensively highlighted (Houseman, 1999; Offer, 1999; Batzios et al, 2001). It is now quite clear that as the number of PCs at the farm level proliferates and the Internet infrastructure is rapidly expanding, IT will be increasingly adopted and will eventually play an essential role in providing agricultural extension and information delivery services. However, despite the plethora of available tools and services there is an increasing amount of evidence that the estimated benefits and the expectations from using IT, are usually significantly higher in comparison to the benefits which are experienced in reality by farmers in most Western European countries (Gelb, 1999; Gelp and Bonati, 1999). Adoption rate by farmers and extensionists is slow and several reasons have been identified explaining this situation (Gelb et al, 2000).

The paragraph above briefly describes the current status about the adoption of IT for agricultural services in Western European countries. However, the situation in most Eastern European countries, as they are moving fast towards de-regulation and western-type market

economies, is substantially different. Clearly, the agricultural industry and trade, the needs of farmers, and the socio-economic environment in most Eastern European Countries is significantly different in comparison to the average Western country. Therefore, the adoption of IT requires different approaches and should solve additional problems (e.g. the lack of a reliable telephone or data network), before IT-based agricultural services can be realised.

The goals of this paper are twofold. First, is to discuss the current status and developments about the use of IT by extension services providers in Albania. The second goal is to report practices and experiences of an ongoing international Western development and research programme which aims to promote the adoption of IT in a developing country such as Albania. Several factors limiting the use of IT by farmers and extensionists which are reported in the literature (Gelb et al, 2000) are discussed, and their influence to IT adoption rate in Albania is reviewed.

CURRENT IT ADOPTION RATE IN ALBANIA

Similar to other developing countries, soon after the democracy was established in Albania, most governments have sought to develop public extension services (Van den Broek and Sijbenga, 1995). These services are primarily developed based on staff from the old public organisations. The efforts of the government are usually concentrated to develop a network of extension centers in different areas of Albania. Since 1998 all of the different 36 districts of Albania have their own extension center (Bicoku et al, 2000). Some major investments in IT have been made so extension centers can now provide basic IT facilities to support their operation. This is considered as a key factor to increase efficiency of the agricultural industry. In that respect comments that "IT adoption is a dictate of economics and a competitive production-environbnment" (Gelb et al, 2000) are confirmed. In parallel to the public extension services, several Non Governmental Organisations (NGOs) have build their own networks of extension centers in co-operation with private agricultural organisations and enterprises.

The International Fertiliser Development Center (IFDC) is an international, non-profit NGO with a mission and focus on increasing food and agricultural productivity in developing countries and newly emerging democracies. Since 1992, IFDC/Albania has undertaken a project in Albania to provide technical assistance and extension services to Albania farmers and agricultural enterprises. Although, the initial plans of IFDC focused on fertilising issues, the project had to be modified to adopt in several developments that occurred during the privatisation of different sectors of Albania economy. Nonetheless, an important lesson that we learned early and an important experience gained from this project is that the offered services should be flexible and ready to be customised in order to meet the requirements in a rapidly changing environment.

The authors of this paper were also involved (one of them as the project coordinator) in a TEMPUS European Union (EU) project. The project is a joint effort of seven partner institutions. Three of the partners are from EU countries and four of them are from Albania. The partners from Albania are the agricultural university of Tirana and the Fan S. NOLI university of Korca, the Ministry of Agriculture and Food (MAF), and the largest private agricultural association in Albania called AFADA (Albanian Fertilizer and Agri-Business Dealers' Association). MAF has more than 700 people working as extensionists. AFADA offers the largest private sector extension system (network) in Albania sponsored by IFDC.

The initial aim of the project was to produce a complete set of teaching and training material for agricultural education and extension. Another aim was to facilitate the development of extension laboratories in the two agricultural universities and to extent these laboratories as information and extension centers. One of the main objectives of the project was to establish an efficient IT framework to support the extension centers in providing their services.

From the early beginning of the project it was clear that the main problem in our effort to promote the adoption of IT, would be the very limited penetration of PCs in the Albanian economy. It is estimated that less than 2% of the farms in Albania have some access to PCs. Also, very few agricultural commercial holdings make use of PCs in running their business. High IT pricing is one of the main reasons which explains the low penetration of PCs. This should be aggregated with the large technology gab and the lack of technological infrastructure due to the socio-economic environment before democracy was established. Universities are in a much better position since most of them have now access to modern PCs. Also, most of the public and private extension centers that are scattered throughout Albania and are sponsored by the ministry of agriculture or other non-governmental organisations (e.g. AFADA /IFDC) are equipped with modern PCs.

Another problem is the very low quality and reliability of the public telephone network. Additionally, it should be pointed out the absence of any Internet Service Provider (ISP) and the lack of any kind of widely used data network which could offer some type of on-line connection between information systems located in different areas of Albania. Reliable connection to the Internet is only possible using satellite technology. In fact, some private organisations such as IFDC and partly the universities and the ministries have some kind of connection to the Internet. Unfortunately, this type of connection is quite costly (500 to 900 USD/month) for most private organisations and the agricultural extension centers (both governmental and privately sponsored). An additional problem is that in the uncommon case of a satellite connection to the Internet, usually intranet networks within organisations are very limited, therefore only few people have access to the Internet.

Recently, three ISPs have started to operate and they offer dial-up connection to the Internet using the telephone network. Unfortunately, their presence is limited only in the main Albania cities: Tirana, Durres and Elbasan. So, almost entirely the south and the north regions of Albania can not have dial-up connection.

Gelb and Bonati in their summary report (1999) identified that Internet accessibility on individual farms or at farmer gathering locations is one of the main critical success factors for Internet-based (on-line) extension services. Clearly, this factor is not yet sufficiently met in Albania. Given the situation described above, we soon realised that it was not feasible to offer any on-line extension service. Therefore, a decision was made by the project team to build an IT-based information systems that it could be used off-line.

At the same time we wanted to establish an IT framework which will be open and extensible. These IT architectural decisions will allow us in the (near?) future to convert and offer on-line the services that we initially designed and developed to be used off-line.

BUILDING A DECENTRALISED NETWORKED EXTENSION SERVICE

The practice we followed was to build two different databases storing and processing data which can be used for providing useful information and advice to farmers, agricultural enterprises and organisations. Before we start to design and build the databases several meetings between all the collaborators have been organised to precisely identify the information and extension that different people may need. Before that, we tried to identify different target audiences (e.g. farmers, extensionists and input dealers) and to find some tangible benefits for each audience in using the extension service.

The first database was build with the co-operation of Technological Educational Institute (TEI) of Thessaloniki and AFADA/IFDC with the financial support of NATO that had provided a NATO Fellowship to one of the co-authors of this paper. The database has information about agricultural products and enterprises in Greece classified in more than 100 categories. It

additionally contains information about where someone can find extension training services as well as agricultural formal training in Greece.

This first database was primarily considered as a repository of useful resources which could help private input dealers and extensionists in Albania. However, because this first database was only limited to information about enterprises and services based in Greece, its usefulness was limited *mainly* to those who had or want to start some kind of collaboration or trade with Greek enterprises.

The second database has a different scope and objective. The information which is captured in this second database is about agricultural products, services and enterprises in different areas of Albania (Fig. 1). Its main objective is to become a primary resource for people who want to retrieve information about the Albanian agricultural sector.

The second database is the result of a joint effort of all the different collaborating parties of the TEMPUS project. It was designed so it could splinted and distributed to different collaborators. Due to the lack of

Fig. 1 The four phases to produce the database.

any public on-line data network it wasn't possible to have a single central copy of the database which it could be accessed on-line from different distributed areas. This practically means that we have multiple instances of the database, one instance for each collaborator.

Each collaborating party has undertaken the responsibility to collect all the relevant information in its geographic area. Basically, each party in collaboration with the private and public extension centers in its area acts as an information and processing "factory" which collects, evaluates, classifies and stores data in each "regional" database. This design actually resembles a network of organisations and their people which are located in many different places in Albania and all together actively collect and organise data.

At the time of writing this paper, there are 4 main processing centers working within this scheme. Under the co-ordination of these main processing centers there are 14 more extension centers and NGOs which are actively collect and store information in their "local" databases.
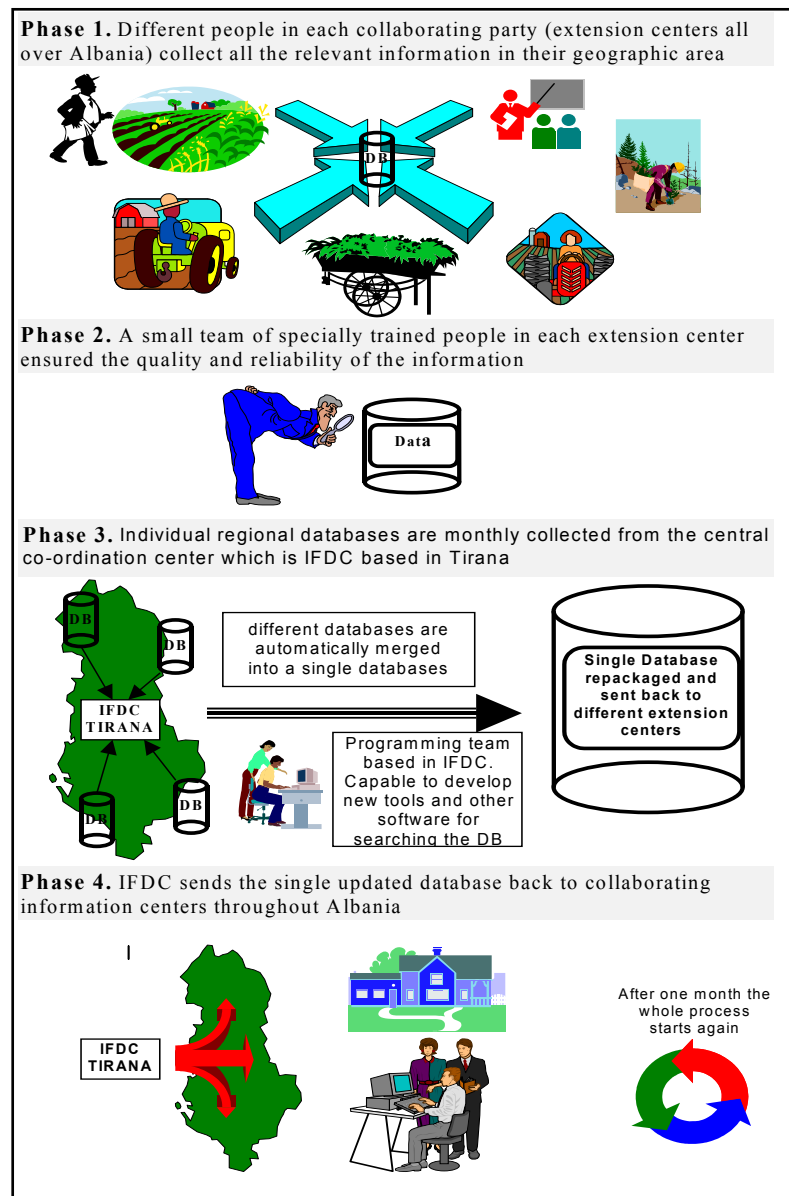
After collection of raw data, a small team of specially trained people in each extension center ensures the quality and reliability of the information that was collected and stored in the "regional" database.

Individual regional databases are monthly collected from the central co-ordination center which is IFDC based in Tirana. Using a specially developed tool different databases are automatically merged into a single database having all the inconsistencies and redundancies removed. The single updated database is afterwards re-packaged and is sent back to the extension centers that participate in this IT-based extension programme. IFDC has been selected as the central co-ordination center because it has a software development team capable to build the front-end interfaces that are used from end-users to access the database. They have also taken the responsibility to update existing software based on the users feedback and experience. At the same time the whole IT development process is supervised from the TEI of Thessaloniki which provides technical assistance.

The database will be distributed in a CD ROM, therefore anyone who has access to basic PC facilities can use it. It is based on a "simple interface" principal, so that people having a minimum knowledge of IT can use it efficiently and effectively. Besides the capability to make simple alphabetical and thematic searches, the database is bundled additionally with a simple to use, user-friendly search engine that allows end-users to conduct keyword-based free-text queries. These types of queries are easier to use and they usually are more effective in large information repositories.

The fact that the database in each regional extension center is updated monthly can not give very efficiently the benefit of providing "just in time" information. However, given that the collaboration and exchange of ideas between farmers and extensionists in different areas of Albania is quite difficult due to the existing socio-economic situation, having monthly updated information of high quality is considered very important for the Albanian agricultural sector. Another important factor is that within the framework of our programme individual extension services all over Albania have been organised and become a member of a larger extension network that can provide services of better quality and usefulness. In fact, we tried to transform individual centers into extension centers that can offer "one stop information shopping".

From an IT perspective, although our approach can not be characterised as novel, however it is probably the only one which can be realistically applied. At the same time we managed to design and develop a basic but rather *extensible* IT framework. We expect that the "regional databases" will become the cornerstones for any future development aiming to use IT for providing extension services of high quality.

For various reasons, the development of IT infrastructure should be the priority of any Albanian government. We hope that very soon the infrastructure will exist so our basic IT framework could be extended to provide Internet-based extension services.

CONCLUSIONS

The work which was presented in the paper was primarily driven by the need to promote the adoption of IT for extension services in Albania. The biggest problem is the relatively low knowledge of IT by most people in Albania. Lack of infrastructure, low penetration of PCs and high IT pricing are other important problems. Also frequent staff changes especially in public organisations due to political instability was another bad experience which clearly affected the smooth operation of the programme (lack of continuation). Another important problem is the lack of any sufficient telecommunications infrastructure that may support on-line Internet-based services. Access to the Internet is limited only to few large cities and most of the other rural regions do not have any access to the Internet.

Most Western European countries are now moving fast towards Internet technologies. Most of the applications and the services that have been developed in last decade are transformed to

Internet-based applications that can provide extension services of high quality and efficiency. On the other side, the approach which is presented in this paper is more primitive. Basically, it comprises the development of a database which has information about the agricultural sector.

Of course, we do not believe that by simply typing and storing lots of information in a database system, we can build a fully functioning extension service. It requires much more applications to have a high quality extension service. Typical examples of such applications are bulletins, newsgroups or other communication facilities (e.g. mail and Net-meeting). However, under the present circumstances these applications are unrealistic. We consider the effort which is reported here as a first starting point which will allow to move to a second more elaborate step. This step should follow an approach where the services should be offered on-line using the Internet.

From a user-centered perspective a serious effort was made to design a friendly user interface and an easy to use search engine to assist information seeking. Target audiences have been identified through careful investigation of user groups and we tried to organise and package information in a way that it can be easily retrieved. Finally, we emphasised quality in the collected information, therefore we adopt a full "quality assurance" phase (phase 2) after the initial information process.

On the other hand, from a managerial perspective the success of this project is that it managed to co-ordinate all these different organisations and people each having probably a different view and aspect about agricultural services. The network of extension centers we have set up are already operating as farmer gathering points. It is quite encouraging that despite the inability to use IT efficiently extensionists do not show fear of IT technology, which may be prohibitive for increasing IT adoption rates. This network of "agricultural information shops" may be eventually become the basis on which a large scale IT-based extension service of higher quality may be developed.

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