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## ICT in Agricultural Enterprises in the Czech Republic – Exploration 2010

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### Abstract

The present paper brings an outline of the methodology and chosen results of an extensive ICT development survey in agricultural enterprises that was carried out in the second quarter of 2010 in the whole Czech Republic. The survey was aimed primarily at the analysis of internet connectivity development in rural areas (i.e. areas where the majority of enterprises operates), at the technical and program equipment and last but not least at the present state and current trends in ICT use. This follow-up survey prosecutes the studies that were administered within the last two years (2009 in particular). In comparison with previous years, it comprises two brand new domains (e.g. social networks and their use, program equipment used in different segments of animal production, crop production and economy). The research was prepared, carried out and administered by the Department of Information Technologies in cooperation with the Information and Consulting Center of the Faculty of Economics and Management of the Czech University of Life Sciences.

### Key words

Information and communication technologies, broadband, ADSL, Wi-Fi, 3G, LTE.

### Anotace

Příspěvek prezentuje metodiku a vybrané výsledky rozsáhlého šetření rozvoje informačních a komunikačních technologií (ICT) v podnicích zemědělské výroby, které se uskutečnilo ve druhém čtvrtletí 2010 v rámci celé České republiky. Cílem je analyzovat rozvoj internetové konektivity ve venkovských regionech (zde působí naprostá většina podnikatelských subjektů), vybavenost technickým a programovým vybavením a dále zjistit stav a aktuální trendy využívání ICT. Průzkum navazuje na šetření provedená v předchozích dvou letech (především 2009). Proti minulým rokům zahrnuje nově zkoumané oblasti (například sociální sítě a jejich využití, používané programové vybavení v jednotlivých segmentech živočišné výroby, rostlinné výrobě a ekonomice). Výzkum připravila a realizovala Katedra informačních technologií ve spolupráci s Informačním a poradenským centrem Provozně ekonomické fakulty České zemědělské univerzity v Praze.

### Klíčová slova

Informační a komunikační technologie, vysokorychlostní internet, ADSL, Wi-Fi, 3G, LTE.

### Introduction

The process of building the information and knowledge society is first of all connected with the development of information and communication technologies. It has been recently going through a fast and turbulent development in basic domains, such as technical infrastructure and program equipment and is accompanied by an increasing volume and variety of available information, requirements concerning its effective use and new possibilities of its utilization.

The present paper brings an outline of the methodology and chosen results/outcomes of an extensive ICT development survey in agricultural enterprises that was carried out in the second quarter of 2010 in the whole Czech Republic. The survey was aimed primarily at the analysis of internet connectivity development in rural areas (i.e. areas where the majority of enterprises operates), at the technical and program equipment and last but not least at the present state and current trends in ICT use. The follow-up survey prosecutes the studies that were administered within the last two years (2009 in particular) [1], [2]. In

comparison with previous years, it comprises two brand new domains (e.g. social networks and their use, program equipment used in different segments of animal production, crop production and economy). The research was prepared, carried out and administered by the Department of Information Technologies in cooperation with the Information and Consulting Center of the Faculty of Economics and Management of the Czech University of Life Sciences.

The paper deals first and foremost with the methodology of the survey itself, internet connectivity accentuating the individual technologies, broadband connectivity and mobile communication. Other problematics is mentioned in less detail or just informationally and will be published later on.

### **Objectives and methods**

The 2010 survey is a follow-up to ICT surveys that were carried out in previous years, firstly between the years 2000 and 2003, then in 2008 and 2009. The survey was prepared in the first quarter of 2010 and was carried out from 26th April to 31st May 2010. It was focused solely on the enterprises that manage at least 100ha of farmland. It means that 4,411 Czech corporate entities were addressed in the first half of 2010. These entities manage the total farmland area of 3, 096, 000 ha, out of which 2, 287, 000 ha of arable land, the area which represents 88% of farmland and 89% of arable land of the Czech Republic. Elementary company identification was based on the Czech LPIS register.

A comparable survey – i.e. a survey focused on agricultural enterprises or countryside in general - has never been carried out in the Czech Republic. Nevertheless, this problematics is crucial while solving the so-called digital divide within the framework of Czech rural areas.

All selected respondents were posted a cover letter including the guidelines and a questionnaire to be filled-in and returned by post. The questionnaire was as well available as an on-line web form allowing to save changes continuously and to finish it later on. In comparison with previous years, the

option of downloading the form was withdrawn due to its redundancy. Even if 136 enterprises employed the above-mentioned option (i.e. downloading the form, filling it and sending it by email) in 2009, the new web form with interim saving of the questionnaire was supposed to replace it fully.

Internet data collection was carried out through the agrarian WWW portal AGRIS (<http://www.agris.cz>), portal provided and administered by the Information and Consulting Center FEM CULS in cooperation with the Department of Information Technologies. The portal is well-known to agriculture professionals in the long-term perspective. Figure 1 is a sample of 2010 WebForm that was available on <http://www.agris.cz/pruzkum2010/>.

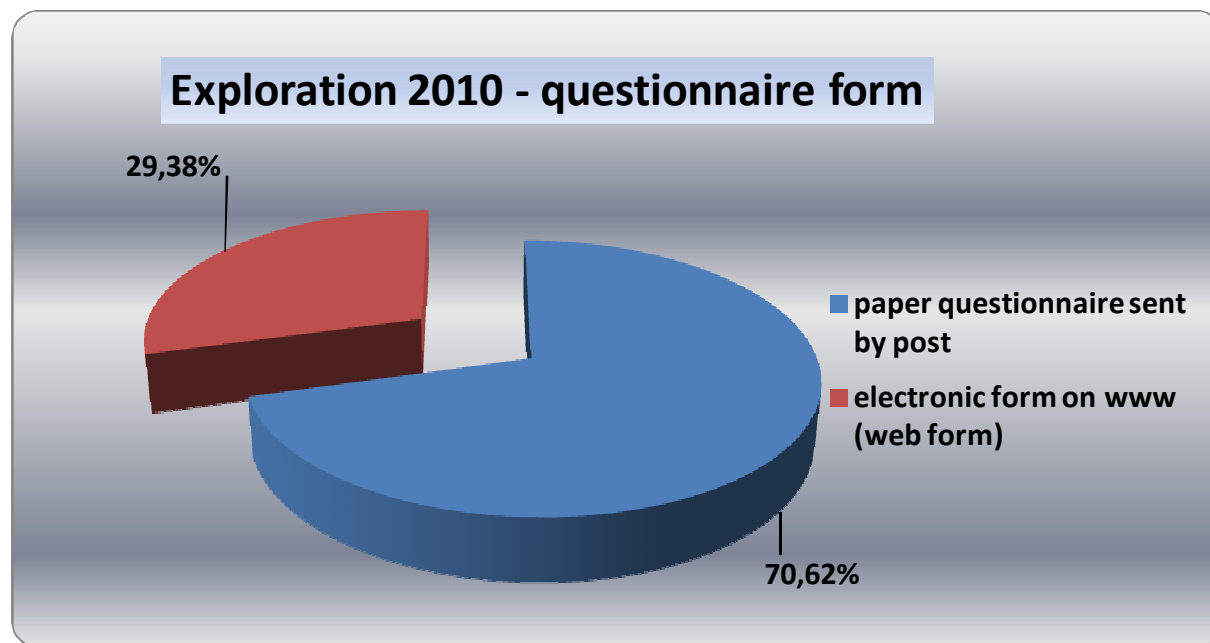
When compared to 2009, the questionnaire was partly modified and significantly extended. While entries concerning the production as such were reduced, questions related to internet connectivity, internet use and mobile communication were extended and specified. Furthermore, new non-agricultural activities – such as e.g. agrotourism, wood processing and meat processing - were introduced. The ICT domain was not only extended towards social networks and their utilisation, the scope of program equipment used in the individual segments of animal production, crop production, economy and consultancy but as well towards collecting information for the sake of entrepreneurial activities.

### **Results and discussion**

The total of 902 relevant questionnaires was collected in 2010 survey, representing 20.5% of all the respondents (enterprises) addressed. These enterprises manage the area of 781,000 ha of farmland, i.e. 22% of the farmland in the Czech Republic (596,000 ha of arable land which is more than 23% of arable land in the Czech Republic). The way of obtaining results (i.e. questionnaire form) is shown in graph 1. Almost 71% of respondents preferred a classic paper form of the questionnaire to the electronic WebForm (29%). Similarly to previous years, a "conservative" approach of the focus group arises from the significant prevalence of the paper questionnaire.



Figure 1: Web form – Exploration 2010.



Graph 1.

## **Technical and program equipment**

Technical equipment facilities – PC stations, notebooks, mobile equipment (PDA, smartphone) were monitored. In accordance with general current trends, we can observe (2010 against 2009) a growth in notebook and PDA numbers. While the share of PCs decreased from 82.5% to 77.9%, the share of notebooks on the other hand increased from 16.5% to 20.5% and the PDA share went up the most significantly from 1% to 1.6%.

Furthermore, the number of printers was investigated. As far as the basic program equipment is concerned, operation systems and net systems instalment was inquired. Using office packages, economic and consultancy programs, program equipment for animal production (cattle, pigs etc.) and crop production programs was newly introduced to the questionnaire. The results of the above categories have not been included in the present paper. They will be of course analyzed and published later on.

The use of social networks represents a new and highly interesting questionnaire category which is being analyzed recently. However, several summary results can be presented here. The use of social networks is still relatively low – when used, Facebook is the most used network (as expected), followed by Google Buzz. Other social networks (LinkedIn, MySpace, Twitter) are used only a little, each in 10-12 cases. The networks are used mostly for personal communication and information collecting but not really for company presentation, which is quite surprising. We can assume that the use of social networks go on spreading as well within agricultural enterprises but conservative approach is supposed to prevail for the moment, hindering their wider acceptance.

## **Internet connectivity and use of internet**

Corporate internet connectivity (i.e. the number of enterprises having internet connection) has increased further to 94.6% and other enterprises are planning to establish it too (3.2%). Most connections are realized via broadband, i.e. the transmission speed of 256 kbps (according to the applicable broadband limit). High-speed connectivity then represents 70.5% of all reported connections. According to the survey, narrowband

accounts for 29.5% of all connectivity – including ISDN, classic telephone line, mobile GPRS connection. Many enterprises of course use combine more kinds of connectivity at once. Details are shown in graph 2.

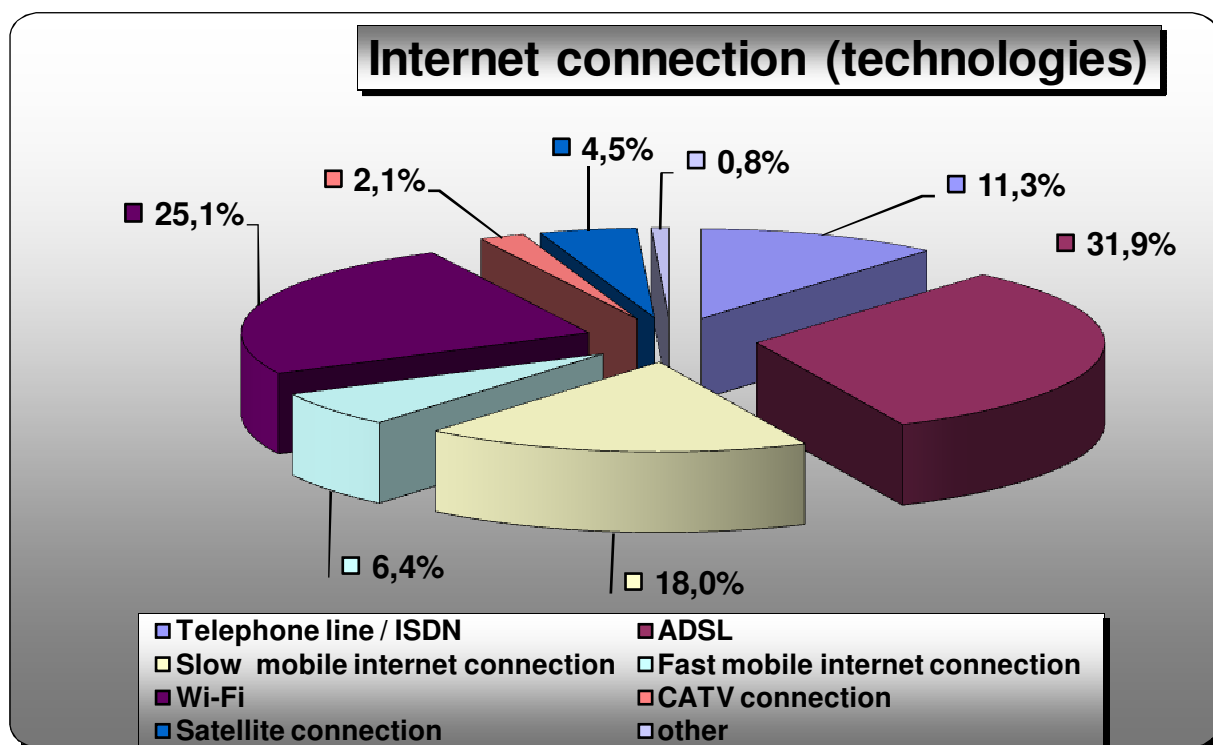
In 2010 (as opposed to previous surveys) all available internet connection technologies were taken into account even if some of them – e.g. cable internet (CATV) or satellite connection are not really widespread in rural areas and their role is quite marginal. However, the survey reported a surprisingly high share of this connectivity – namely 6.6%. In case of CATV connection with a share of 2.1%, enterprises seated in bigger towns or cities are involved. Satellite connection (4.5%) is obviously an acceptable option for some enterprises.

Mobile internet connection has been as well analyzed from the point of view of operators presence. 79% of narrowband and even 85% of broadband connection is provided by the Telefónica O2 company whose dominant market position is obvious. It is necessary to mention that high-speed mobile connection is reported only in 95 cases, i.e. 11.1% of the enterprises. However, at the time of the survey, this company offered adequate technologies and relatively the best coverage.

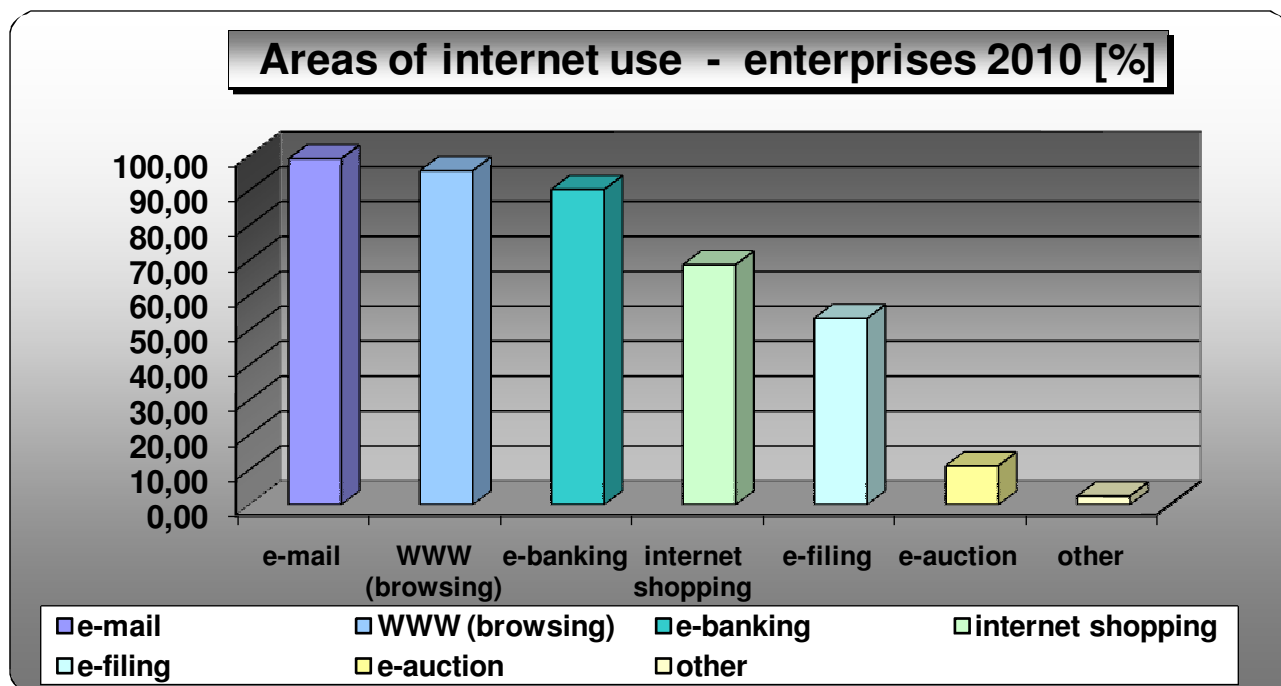
The fields of internet use are standard – nearly 100% of all enterprises (94%) with internet connection report using email the most, then browsing websites and e-banking services (more than 90%). Shopping over the internet is less common, however, it exceeded 68%. The use of e-auctions and e-submitting was a new criterion in 2010 survey. E-submitting is used in more than 54% of cases, e-auctions 11%. A detailed overview can be found in graph 3.

As a rule, just a small share stands for company presentation while only 23.5% of the connected companies have their own websites while other 12% are planning to create them (see graph 4). Only 3% of agricultural enterprises run their own e-shop but 5.6% have already made plans to open one too.

The survey brought some very interesting data concerning internet information services where awareness and use of government department information resources were analyzed. An essential



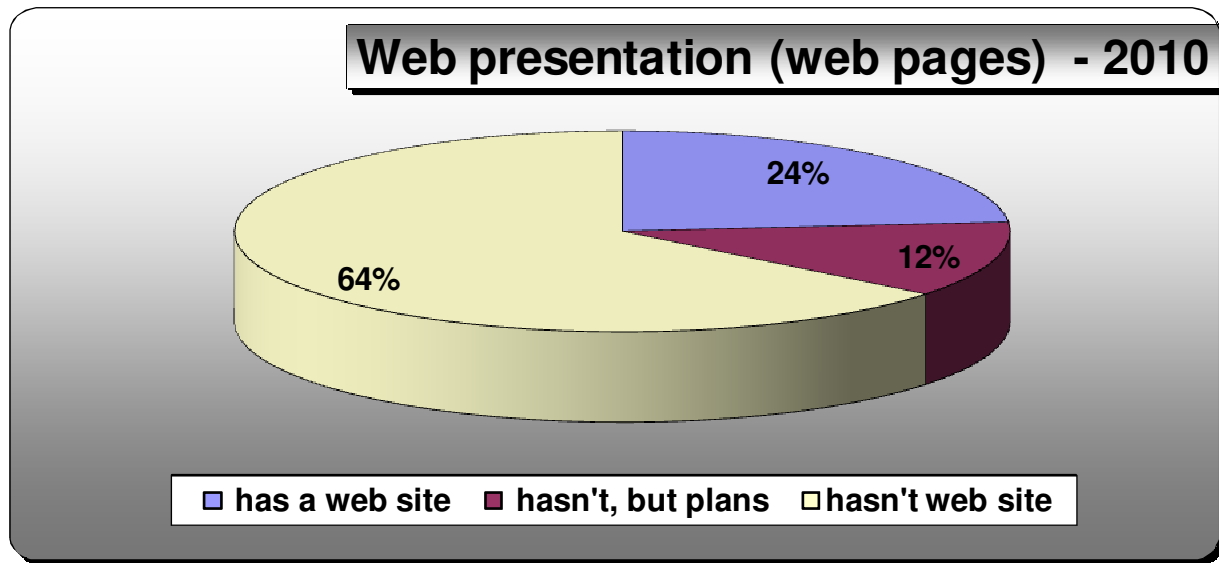
Graph 2.



Graph 3.

change happened thanks to the integration of all official information portals (in particular the Ministry of Agriculture of the Czech Republic and Farmer's Portal but except for the State Agricultural Intervention Fund!) into one-portal solution called eAGRI. This solution facilitates access to all

official departmental information and should have been completed - for the sake of effectivity – a long time ago. Significant financial means were wasted recently on integrating the systems that have been developed independently (The Department of Information Technologies recommended the above



Graph 4.

mentioned one-portal solution to the employees of the Ministry of Agriculture more than ten years ago while developing the very first ministry portal...). Official government department portals – SZIF and eAGRI - are the most known among users, followed by specialized information portals Agroweb, AGRIS and then the Agronavigator portal and two portals of the Agrarian Chamber of the Czech Republic – Regional KIS and APIC-AK. The eAGRI portal fell behind the SZIF portal to the second place in 2010 (contrary to 2009) – it could mean that users are not fully accustomed to it yet.

## Conclusions

The paper presents and discusses chosen results of a recent survey on ICT state and development in agricultural enterprises that was carried out in the first half of 2010. The paper is focused on the survey methodology and broadband connectivity.

As stated above, internet connectivity and especially its quality is a key factor of information society building. In spite of technological development and general European/global trends, internet connectivity in the Czech Republic is not developing fast enough towards broadband connection [3]. This is especially the case of rural regions where both local enterprises and inhabitants are remarkably affected by this lack. However, the survey shows quite a significant shift towards broadband in recent years. Broadband is nowadays represented first of all by ADSL and Wi-Fi technologies - new fast mobile technologies (3G

and LTE) seem to be very perspective from the point of view of rural regions.

**ADSL** is the most widespread technology (with a share of almost 32% according to the survey). However, it is generally hindered by a low quality of lines and switchboard distances (length and quality of local loops). ADSL is now being offered not only by the O2 company but as well by other telephone operators, T-Mobile in particular (it goes without saying that the above-mentioned loop limitation applies here too as they are owned by the O2 company). ADSL price availability has increased too firstly thanks to providing the so-called naked ADS (ADSL without being obliged to pay for the fixed line for calls) and secondly thanks to promotional marketing actions and competition in general.

**Wi-Fi** (25% share according to the survey) is – in the long-term perspective - the most available technology in the country, including border regions where ADSL is not available at all due to technological or economic limitations. In cities, suburbs and urban areas, Wi-Fi suffers from disturbances that occur because of high number of nodes and stations. This problem actually does not exist in the country but general Wi-Fi technology limitations apply (the technology is not suitable for outdoor use, longer distances and its reliability is weather-conditioned). In comparison with other countries, including the EU, the number of Wi-Fi users in the Czech republic is a unique phenomenon.

**Fast mobile internet connection** is another means of connectivity that is now provided (or will be provided as soon as the infrastructure is built) by all operators. Until now, this technology has been restricted to big cities but step by step it starts being available in smaller towns too. We can suppose that wireless broadband based on fast mobile internet (conventional 3G network, perspective LTE etc.) will constitute the most convenient solution for rural areas and as a result, it will be given priority and support within the EU [4], [5].

A recent upsurge in EDGE mobile technology can be generally welcome and this technology is spreading massively in rural areas this year. Unfortunately its speed is even below the broadband speed limit (which is itself very low from today's perspective). However, from the point of view of country connectivity, we can speak about a significant progress.

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The survey was concerned with agricultural enterprises that actually all operate in rural areas. That is why some conclusions (internet connectivity, fields of internet use etc.) illustrate at the same time the situation in the country as such. It means that these conclusions are applicable also to non-agricultural enterprises and inhabitants in general. Other results, on the other hand, can be generalized only partially (basic technical and program equipment, use of browsers etc.) and some are unique and typical of agricultural enterprises (special program equipment, resort portals awareness and use etc.).

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