

## Information Services and ICT Development in Agriculture of the Czech Republic

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### Abstract

The paper presents results of KIT (Department of Information Technologies) research which maps the actual state and expected development trends of information and communication technologies in conditions of CR agriculture. It includes results of investigation realized in 2008 with connection to the actually carried out inquiry in the first half-year 2009.

### Key words

Broadband, ADSL, FTTx, Wi-Fi, CDMA

### Anotace

Příspěvek prezentuje výsledky výzkumu KIT PEF ČZU v Praze (Katedra informačních technologií), který mapuje aktuální stav a očekávané trendy rozvoje informačních a komunikačních technologií v podmínkách zemědělství ČR. Zahrnuje vybrané výsledky šetření realizovaného v roce 2008 s návazností na aktuálně prováděný průzkum v prvním pololetí 2009. Jsou zde prezentovány především vybrané výsledky z oblasti technického a programového vybavení (vybavenost pracovními stanicemi a mobilní technikou, instalované operační systémy), internetové konektivity s důrazem na vysokorychlostní připojení (broadband), intenzitu využívání internetu, používání internetových vyhledávačů a internetových informačních služeb v resortu (oficiální a ostatní resortní www portály).

### Klíčová slova

Vysokorychlostní internet, ADSL, FTTx, Wi-Fi, CDMA

### Introduction

Development of information society is represented at present first of all by a state of communication infrastructure which is an essential base for its functioning, further by a total level of technical infrastructure, a used software platform, a spectrum of supplied and used services, as well as an intensity of their use.

The paper's aim is to provide information on results of wide investigation of information and communication technologies in agricultural production businesses in the CR which was realized in the first half-year 2008. It means to analyze development of internet connectivity in rural regions (an absolute majority of entrepreneurial subjects operate here) with an emphasis on broadband; further to found out an actual state and expected development trends of ICT use in a

context of the CR, the EU and other advanced countries outside the EU.

At present (the first half-year 2009) a consequential investigation is in progress which aims to specify selected interest circles, to verify ascertained trends and to update a real ICT development state in the department and in the countryside generally.

### Objectives and methods

The research concurs till this time the widest investigation of ICT use in the department which was repeatedly realized in the period 2000 – 2003 by the Information and Consultancy Center (IPC) in cooperation with the Department of Information Technologies (KIT) of the Faculty of Economics and Management at the Czech University of Life Sciences (FEM CULS) in Prague when these surveys included almost 2 700 enterprises

(respondents) which represented almost 76 % of coverage of arable land in the CR.

By the survey in 2008, in total 667 responses were obtained. Selected conclusions are presented in this paper. The consequential research is actually realized through the first half-year 2009. It includes the already addressed and cooperating subjects and further it is completed with a selected group of businesses with use of MZe CR background data.

Respondents (entrepreneurial subjects) were sent by mail an accompanying letter with instructions, and a questionnaire which they could fill in and send back by mail. The questionnaire was also disposable for downloading on the internet (with a possibility of off-line filling and sending by e-mail back) and also on-line as a web-form. In both cases the agrarian WWW portal AGRIS (<http://www.agris.cz>) was used, which IPC in cooperation with KIT operates (a way of respondents' answers see figure 1).

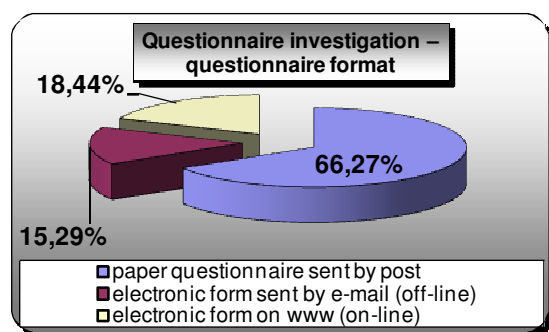


Figure 1: Questionnaire investigation – questionnaire format.

From the presented figure it is obvious that practically two thirds of respondents preferred „a classical“ paper form of questionnaire to electronic forms (off-line, on-line) whose representation was in total only third (33,73 %). It shows evidence of a considerable conservatism of the target group regarding the investigation object.

## Results and discussion

### Technical and program equipment

Endowment of businesses with technical means was not investigated in details in term of HW parameters, nevertheless, in the observed respondents group the ratio of work stations (PC)

and notebooks 1 : 8, PDA facilities to PC 1 : 32. It represents a relatively low number of mobile techniques, however, which will probably increase gradually.

Operation systems installed in the work stations show generally practically the same structure which is characteristic for the entire CR, so more than 90 % representation of the family MS Windows systems. Regarding the supposed worse efficiency parameters of used technique there are more represented older versions (e.g. Windows 98) and minimally new versions (Windows Vista). Details are seen in the figure 2. More than half of business disposes of a computer network, concretely 57 %.

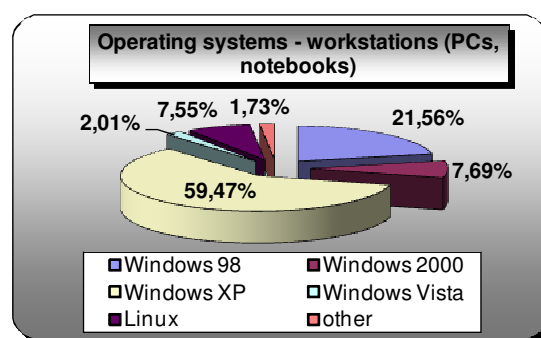


Figure 1: Questionnaire investigation – questionnaire format.

### Internet connectivity

Development of high-speed technologies (broadband) shows itself here with an intense coming of ADSL (almost 35 %) together with wireless connection Wi-Fi (28 %). So, these technologies represents in total 63 % of accessible connectivity. Already only less than third of businesses (28 %) is till this time connected by slow technologies as Dial-Up and ISDN, however, which 5 years ago represented full 84 % (research 2003). A mobile connection takes over 8 %, however, which can represent a slow connection (GPRS) in combination with a quick one (CDMA). For these reasons within investigation in 2009, the attention will be paid to GPRS and CDMA separately. The actual connectivity is shown in the figure 3.

Just the representation of high-speed connection and its quality (parameters) are one of narrow places of enterprise development in regions as well as the country as such.

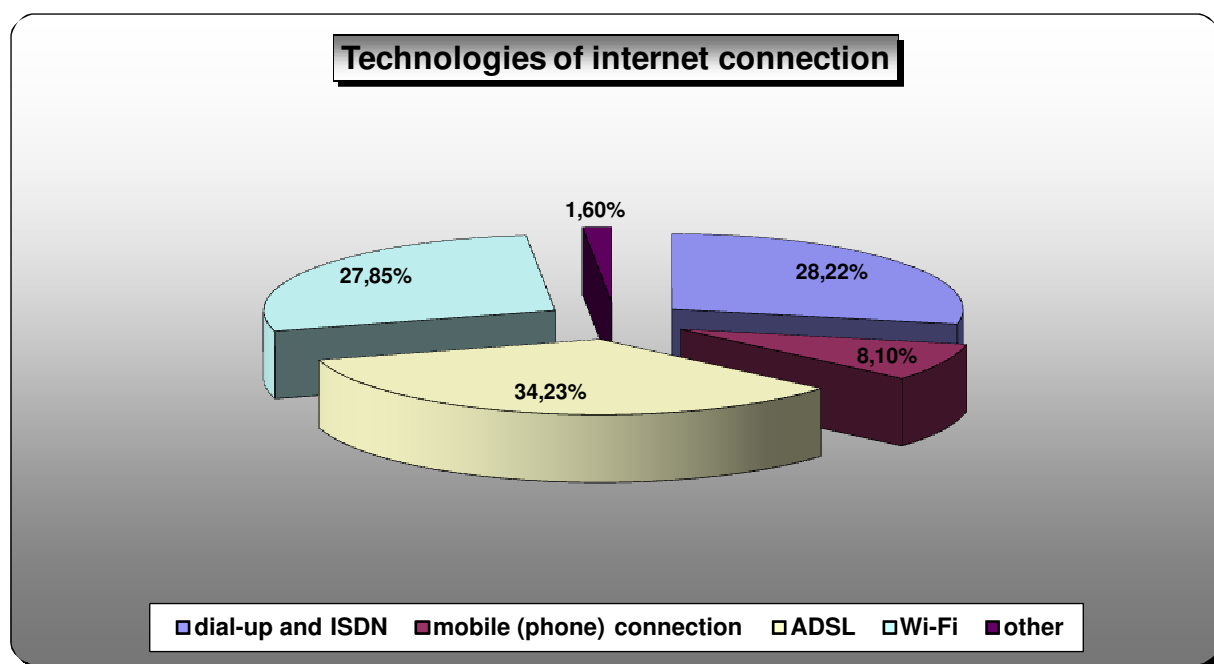


Figure 3: Technologies of internet connection.

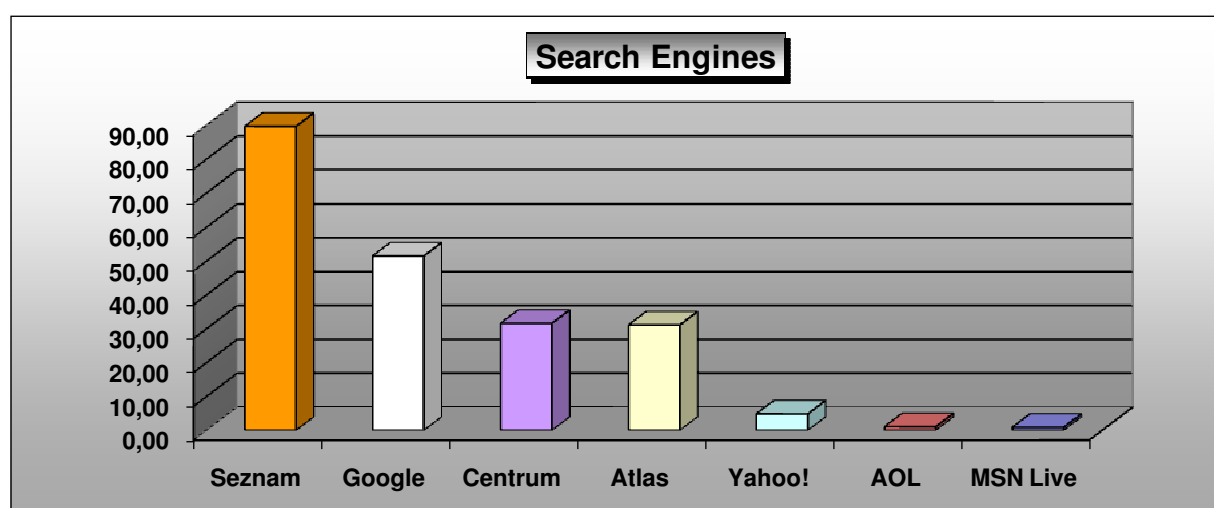


Figure 4: Search Engines.

### Use of internet

The intensity of internet use by entrepreneurial subjects is relatively high, over 91 % of businesses present that they use the internet regularly, of it whole 85 % daily. Areas of the internet use are standard: e-mail (100 %), searching of www pages (96 %), e-banking (87 %). According to expectation, the worse is the use for purchase in internet shops (56 %), significantly lower is for example an operation of own www pages (only 24 % businesses). Firms do not feel here primarily a need of own www presentation as such, and the potential of use of other possibilities, as e.g. e-shop, is very small. An exception can be a supply of agri-

tourism services, or possibly of other activities and service outside agriculture.

A supposed finding is a standard-conservative behavior of respondent group towards a use of internet searching programs. The most used searching program is here according to expectation a domestic Seznam (almost 90 % respondents record it); with a gap Google follows (with 51 %), and other two domestic systems Atlas and Centrum (both with the same share 31 %). Other searching programs as Yahoo!, MSN Live and AOL are used just very little (a range 5 % to 1 %). Aggregate results are shown in the figure No. 4. Seznam.cz generally is for Czech users a synonym of internet,

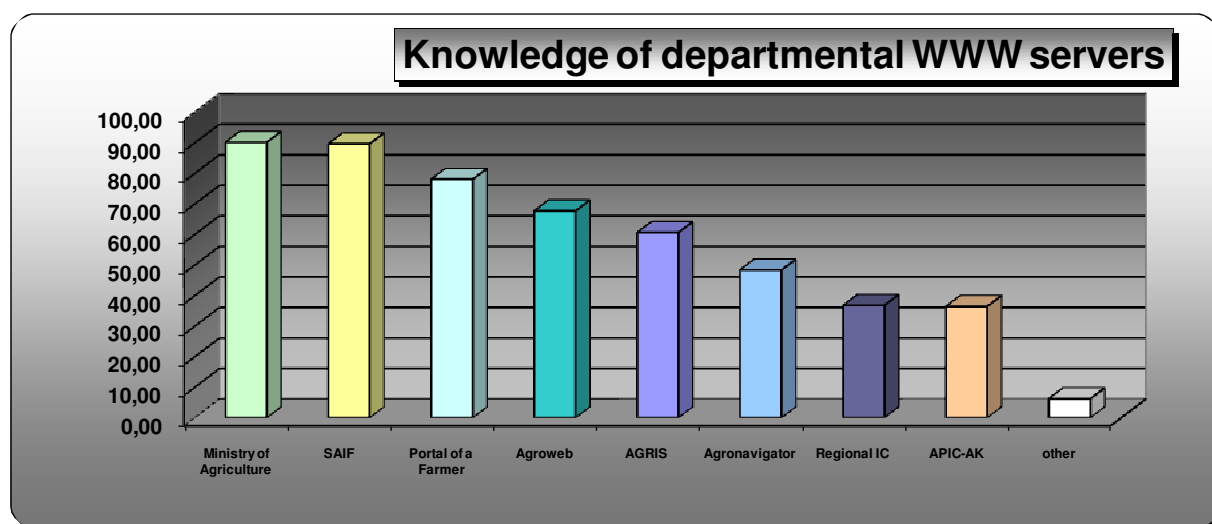


Figure 5: Knowledge of departmental WWW servers.

nevertheless, in the present globalization and a pressure of Google it can be expected that gradually there will be a shift towards the system Google. It will be interesting to observe changes after evaluation of data from the investigation 2009.

### Information services

The research brought very interesting pieces of knowledge in the area of knowledge and use of branch (departmental) internet information sources. Here, among users the most known official departmental portals are MZe (MA - Ministry of Agriculture of the Czech Republic), SZIF (SAIF - State Agricultural Intervention Fund) and Portál farmáře (Farmer's portal), followed by specialized information portals – Agroweb, AGRIS and Agronavigátor, followed by portals of the Agrarian Chamber Regionální KIS (Regional IC - Regional Information Centers) and APIC-AK (ACIC - Agrarian Consultancy and Information Centre) - see figure 5. Knowledge of the first group of portals moves from 78 to 90 % respondents; the second group is created by portals Agroweb and Agris with values above 60 %, with a gap then other portal solutions follow. Other information sources are mentioned only very little (in total 6,22 %). Knowledge of particular information portals in the department is unbalanced and moves in a range from 36,4 % (APIC-AK) to 90,16 % (MZe).

In evaluation of the mentioned information sources use it was found out that all these portals in case of knowledge by users are relatively intensively used. The per cent of their use moves from 68 % Agronavigátor to almost 96 % (SZIF) - details are in the figure 6.

In case of official departmental portals (MZe, SZIF and Portál farmáře), their knowledge and use is given, except a content filling (information content) also by other functions in the area of subsidies, submitting of projects etc. which other information sources cannot offer and do not offer, or only immediately.

From this evaluation results we were pleased with a position of the portal AGRIS which is developed and non-commercially operated by KIT and IPC FEM CULS in Prague (see the figure 6).

### Conclusions

In the foregoing text, selected results of investigation of the ICT development state in agricultural enterprises were presented and partially discussed. However, here a key factor is the internet collectivity and its quality.

Despite technology development and European and world trend the internet connectivity did not develop sufficiently fast towards a transition to the high-speed connection. In spite of that through the past period a relatively substantial shift was recorded towards broadband (including agricultural businesses) which first of all technologies ADSL and Wi-Fi represent. CR specifics, showing themselves significantly in the rural area and also determines business sphere operating here (a significant, maybe a unique position of Wi-Fi, contrary to a relatively low share of ADSL, a minimal development of FTTx, a massive decrease in number of fixed lines, etc.), will probably outlast still.

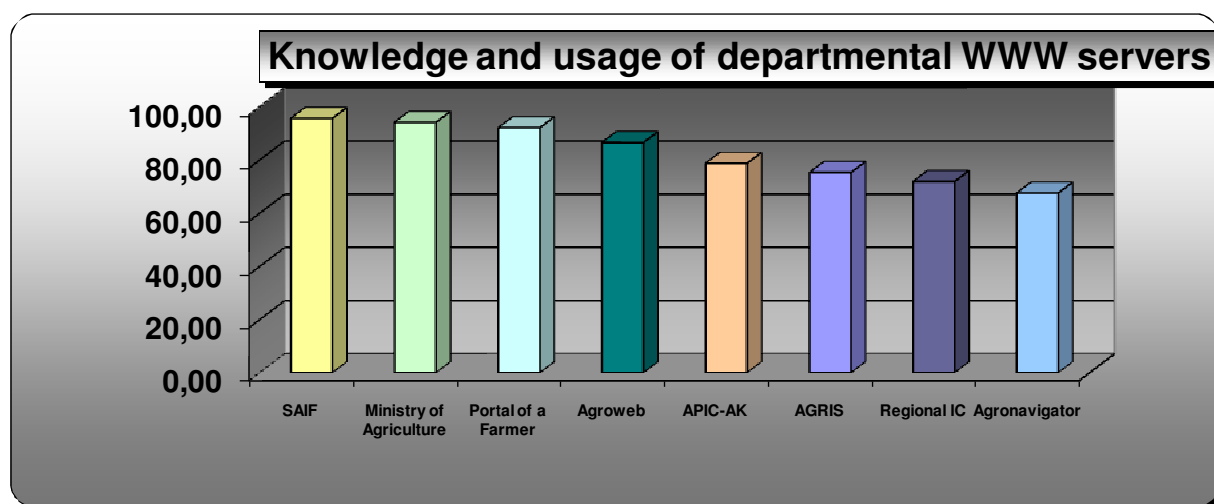


Figure 6: Knowledge and usage of departmental WWW servers.

A solution could be brought partially by the EU intention to give financial meant for broadband development in the country (primarily in the competence of the Ministry of Agriculture of the CR. A basic limiting condition of information society development is a high-speed connectivity. Unfortunately, in the CR conditions there is completely missing a national strategy of high-speed connection development for several years. This important area, to which a considerable attention is paid world-wide but also in frame of the EU, was together with a cancellation of MI ČR (the Ministry of Informatics of the CR) practically completely omitted and left without any conception and support. The result is a deepening of digital abyss between the town and the country.

The CR should fast to adopt a conception and subsequently to start a realization of high-speed networks sufficiently covering rural areas where the high-speed connectivity has not been ensured yet, or where their parameters don't conform.

If we will consider a perspective of the expected use, the technological solution should be supported by FTTx technologies which would create a base of communication infrastructure. They would be in localities, where their use is extremely costly, combined with fixed radio or mobile networks (high-speed).

Of course, the all-area coverage of the countryside would have a very high importance, however, when it has not been achieved with the present technologies yet, it will be reasonable to use new solutions.

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