

State and evaluation of information and communication technologies development in agricultural enterprises in the Czech Republic

J. Vaněk, E. Červenková, J. Jarolímek, P. Šimek

Department of Information Technologies, Czech University of Life Sciences Prague, Prague, Czech Republic

ABSTRACT

The paper presents selected information on the newest results of a wide investigation of the state of information and communication technologies development in agricultural production enterprises in the Czech Republic. The investigation was realized in the first half of 2009 with the main aim to analyze development of information infrastructure and actual trends in ICT use in rural regions where most entrepreneurial subjects operate. Besides a presentation of own research results, some obtained pieces of knowledge are then commented and eventually discussed in connection with official outputs of the Czech Statistical Office (CSO), if they have a certain relevance to the given problems.

Keywords: ICT; broadband; internet; www; operating system; PC

The investigation was carried out in the first half of 2009; till this time it has been the most extensive investigation of state and development of information and communication technologies in enterprises of the Czech Republic agrarian sector. This investigation was partially connected with a research realized in 2000–2003; it was closely related to a foregoing extensive investigation in 2008. The realization was undertaken by the Information and Consultancy Center (IPC) in cooperation with the Department of Information Technologies (KIT) of the Faculty of Economics and Management (FEM) at the Czech University of Life Sciences (CULS) in Prague. The extensive and targeted investigation (by a number of enterprises and by its focus) which included specially the agrarian sector brings a very interesting and relevant view of the given problems of the sector and, subsequently, also of the entire rural environment where these enterprises predominantly operate. It includes many points of view which have not been investigated and published yet.

OBJECTIVES AND METHODS

For realization of the first period of investigation in 2009, primarily enterprises that actively participated

in the inquiry realized in 2008 were selected. To secure the other period of research, an Agreement on Data Providing from the LPIS Register between FEM CULS in Prague and the Ministry of Agriculture (MoA) of the Czech Republic (Department of Central Office of Registers) was made. On the basis of this agreement the MoA provided actual data over the Czech Republic which was used after processing for addressing of other group of enterprises within the second period of investigation in 2009.

A general basic condition for ranking an enterprise in the research was the acreage of managed land by the enterprise which was set to at least 100 ha. In the first half year in 2009 (both periods of the investigation), in total 3902 entrepreneurial subjects from all the Czech Republic were addressed. A well-tried procedure, used in 2008, was applied. All respondents received an accompanying letter with instructions and a questionnaire by email which they could fill in and send back. This questionnaire was also available for download on the Internet (with a possibility of off-line filling-in and sending back by email) and further as a web form (this one could be filled-in on-line, or could be saved uncompleted and finished later, i.e. a combination of on-line and off-line work). In both cases the agrarian web AGRIS (<http://www.agris.cz>), whose IPC operates

Supported by the Ministry of Education, Youth and Sports of the Czech Republic, Project No. MSM 6046070906.

in cooperation with KIT, was used. AGRIS is well-known for agricultural public in the long term and quite without doubt, it contributed to a relatively high number of answers. At the end of the investigation, 1008 questionnaires were received, which represents 25.83% answers.

A way of handover (acquisition) of results by respondents (a questionnaire form) is shown in Figure 1. 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 a third (33.93%). This 'conservative' approach corresponds completely to the situation in 2008. In 2009 there was only a slight increase in the use of the www form at the expense of e-mail; however, there was no general change in favour to electronic form of filling-in and handover.

The situation and the development in the ICT field in the Czech Republic has been researched quite in details by the Czech Statistical Office (CSO). Its investigation has been realized since 2003 and is fully comparable with investigations realized in other EU countries. The results are published annually on the Internet and partially in a printed form. Nevertheless, the enterprises are divided here into three categories according to their size, or a number of employees (10–49, 50–249, 250 and more). From a view-point of the countryside itself, and subsequently of enterprises operating in the agrarian sector, this categorization is generally unsatisfactory, as well as the observed branches where the agrarian sector (agricultural enterprises) is not included at all (the only category is 'Processing industry'). CSO addressed to about 11 300 enterprises in its investigation. The text published in print contains the actual results of 2009 investigation; in some relevant cases they are compared with average results over the Czech

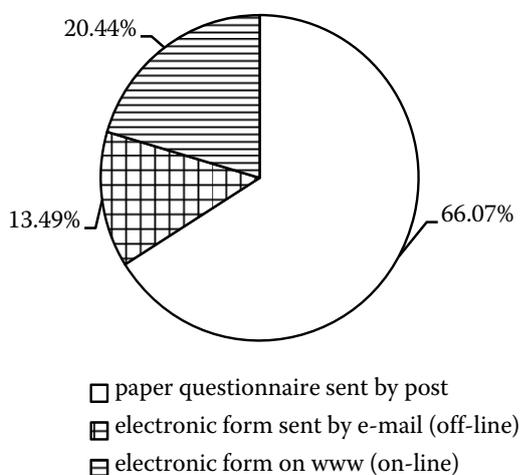


Figure 1. Questionnaire investigation – questionnaire format (2009)

Republic published by CSO, which however show only the year 2008.

RESULTS AND DISCUSSION

One of the main research targets was focused on problems of the Internet and its use. The internet connection is available for an absolute majority of entrepreneurial subjects today (concretely almost 93%), whereas other almost 3% of enterprises plan to arrange it (Figure 2). The ascertained value of 93% approximates the CSO data for the category of small businesses in the Czech Republic where 94% is reported (to compare: it is 98% in medium businesses and 100% large enterprises).

If we look in details at particular connection technologies, a big share is covered by ADSL and further Wi-Fi (which is a significantly specific situation in the Czech Republic). Other alternative is a mobile connection, used practically by 12% of businesses. In contrast, still relatively a high number of enterprises are connected through slow technologies – ISDN or even Dial-up. The current representation of particular connection technologies is shown in Figure 3. It is necessary to mention here, that some enterprises combine several kinds of connection.

In light of broadband, the high-speed connectivity (ADSL, Wi-Fi, CDMA) is used by 66% enterprises. According to Eurostat, 79% of enterprises in the Czech Republic in 2008 had high-speed connection to the Internet, and ADSL amounted to 46% out of it (Eurostat 2009). For particular size categories, CSO mentions the shares of broadband as 75.7%, 90.9% and 96.8%, respectively. Yet, almost 31% of subjects still have a slow connection. The category 'others', which is brought by more than 3% of respondent enterprises, most likely belongs between both the groups. For example, the optical or CATV connection was not a specific subject of investigation here; it belongs among high-speed

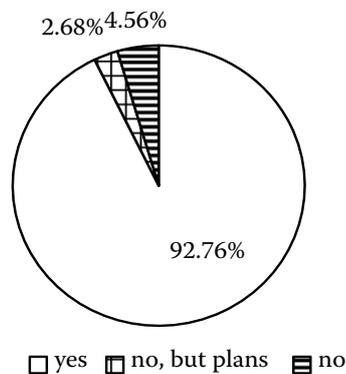


Figure 2. Internet connectivity (2009)

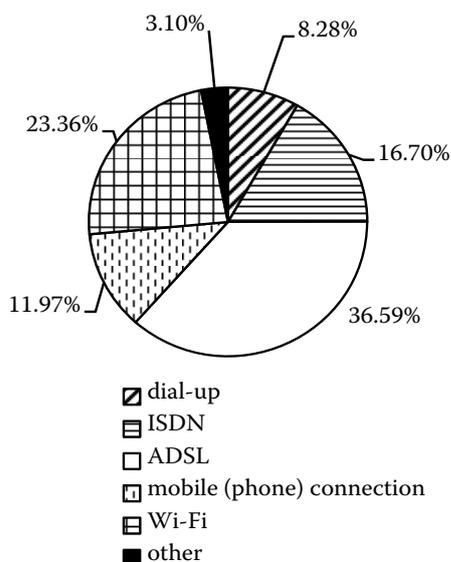


Figure 3. Technologies of internet connection (2009)

technologies, however, without a bigger significance from the viewpoint of rural space.

The intensity of Internet usage is also high; daily usage is mentioned by 93% businesses owning the internet connectivity; use areas are standard – the most frequent is e-mail, then www browsing, e-banking, and also purchase in the internet shops (for more details see Figure 4).

Only 24.5% of enterprises using the internet, have their own www pages (or 22.7% of all enterprises); further more than 13% enterprises are planning to arrange it. Theoretically, it means that almost 38% of enterprises should have their own www pages in the close future. In comparison with other resort and size groups of enterprises it is still a very low number (CSO generally presents a range between 70–93%). Other use areas are rather low, for example e-shop is operated by only less than 4.3% of enterprises. Of course, there is a question of the foundation (usability) of e-shop regarding a character of most agricultural subjects. Nevertheless, it is

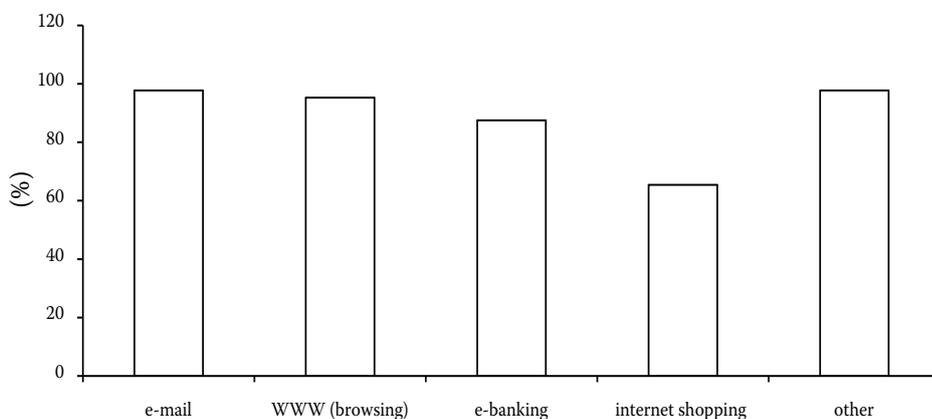


Figure 4. Internet using (2009)

very interesting that according to the investigation other 4.7% enterprises plan to arrange the e-shop – it is more than the number of the internet shop operating currently. The development reality will be likely significantly lower compared to declared plans (the planned increase is almost 115%).

E-shop in a kind of internet presentation with a service supply, and has, without doubt, an indispensable importance for example for enterprises offering services in the area of agri-tourism (accommodation booking, sale of products etc.).

Another area of investigation was a basic technical and program endowment; entirely according to expectation, a prevalence of MS Windows systems was obvious. It is related to a conservative approach of business sphere and it does not concern only the resort. The aversion to transition to Windows Vista is partially due to worse parameters of used computers. Windows systems are applied in total in almost 95% of computers; a detailed structure is shown in Figure 5. In the frame of the MS Windows platform, MS Windows XP system quite clearly prevails; Windows Vista takes only less than 6%. These operating systems are installed in more than 5400 computers; out of it 83.3% is in the category of PC (various configurations); 16.7% are mobile computers of the category notebook.

The research was also focused on many other directions of ICT use, for example knowledge and use of resort information portals, used application software, network installation, server operating systems, used peripheral equipment, setting of means of personal informatics as PDA and so on. Results of the mentioned investigations are not brought in this report, however, they will be gradually published, too.

The research carried out at the beginning of 2008 showed which changes the department had passed through in the ICT area since the last investigation in 2003, i.e. over five years; it mapped a

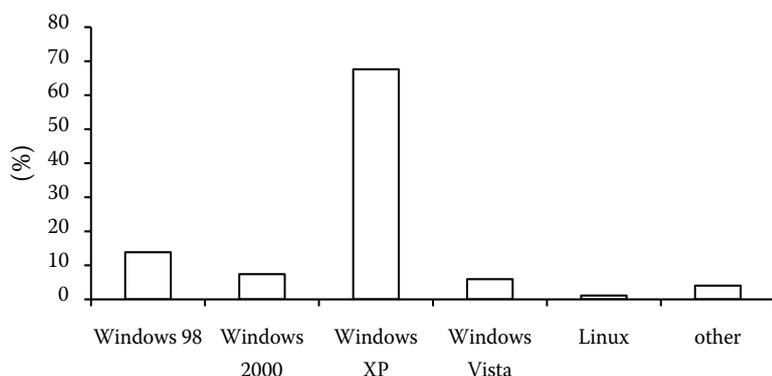


Figure 5. Operating systems PCs and notebooks (2009)

current development state, and indicated possible further development directions. The consecutive research realized in the first half of 2009 further enlarged these conclusions. It dealt with the biggest number of enterprises; with the use of data provided by MoA Czech Republic (from the LPIS register) all entrepreneurial subjects of the department with managed land from 100 ha upwards (in total 3902 businesses) were addressed; in total 1008 respondent questionnaires were acquired and worked out.

For the research in 2009, compared to the version 2008, the questionnaires were enlarged and specified, for example mobile connection was divided into small (GPRS) and speedy (CDMA), and so on. Actual results showed other space for subsequent investigations, for example in contrast to 2008 results, in category 'other', 3.1% appeared in the type of connection, and it is a question which technologies are included here. It can be supposed that it is dealt with enterprises near larger seats where CATV or optics (FTTx) can be used, which are categories which have not been individually observed yet for their theoretical inapplicableness in the country and which belong among prospective high-speed technologies. We assume that the research in this area will further continue also in next years.

The state of development of information and communication technologies in agricultural enterprises in the Czech Republic approximates general Czech Republic conditions in many indicators; however, many differences and specifics have persisted till this time which 'discriminate' the agrarian sector. This problem appreciably touches the country in general, thus also other subjects that carry busi-

ness here, as well as inhabitants. We speak about so called 'digital divide' – the availability of for example Internet connection, high-speed internet (broadband), internet applications etc. Moreover, the situation is more serious because without state strategy and support in this area (in contrary to all advanced countries and the EU countries) an imaginary scissors of economic development open between large agglomerations and small seats and thus the digital divide further increases.

Acknowledgements

The knowledge presented in the paper was obtained as a result of the Research Programme titled 'Economy of the Czech Agriculture Resources and their Efficient Use within the framework of the Multifunctional Agri-food Systems' of the Ministry of Education, Youth and Sports of the Czech Republic – No. MSM 6046070906.

REFERENCES

- Vaněk J., Jarolímek J., Šimek P.: ICT adoption in rural community of the Czech Republic. In: World Conference on Agricultural Information and IT IAALD AFITA WCCA 2008, Tokyo, 771–775.
- Vaněk J., Jarolímek J., Šimek P. (2008): Development of communication infrastructure in rural areas of the Czech Republic, Prague. *Agricultural Economics*, 3: 129–134.
- CSO – Information community in numbers (2009). Available at: http://www.czso.cz/csu/redakce.nsf/i/informacni_spolecnost_v_cislech_2009 (In Czech)

Received on October 26, 2009

Corresponding author:

Ing. Jiří Vaněk Ph.D., Czech University of Life Sciences Prague, Department of Information Technologies, Kamýčká 129, 165 21 Prague 6-Suchbát, Czech Republic
e-mail: vanek@pef.czu.cz
