Mobile Technology in Price Statistics

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Mobile way of processing price statistics data has brought the Czech Statistical Office (CZSO) to one of the top places in this area among statistical offices in the world. The use of pocket PCs for this kind of work fully substitutes desktop PCs. The new technology has a number of benefits leading particularly to higher quality of the resulting consumer price index (CPI). It should be emphasised that the new comprehensive system of processing is not more expensive than the preceding one. Further ways have opened for enhancing the CZSO efficiency and for savings in the area of acquiring statistical data. In view of the dynamic development of this segment of technology, the cooperation with an external software supplier and the following implementation through outsourcing turned out to be a good decision.

1. Requirements on mobile data processing solutions and their accomplishment

    1.1. General requirements

    The aim of implementing mobile solutions in price statistics data processing was primordially

    - to eliminate faults occurring when transcribing data from paper forms into data processing software,

    - to shorten the period of data processing,

    - to enable continuous verifying procedures and to return any suspicious item back to price collectors as the only authority to change the price collected,

    - to improve the quality of the final CPI,

    - to increase statisticians´ efficiency both in the field and in the headquarters.

    1.2. Hardware requirements

    - Optimal size of the display to show all the necessary data in a comfortable way, i.e. the fonts well legible and the screen sufficiently bright.

    - Comfortably wearable in one hand without any danger of being dropped down – the case equipped with a strap or chord enabling free hands moving.

    - The case itself should have been robust and "waterproof".

    - The operating time of the battery would have had to be 8 hours a day without charging.

    - Ability to perform data transmissions via internet.

        Most of the above mentioned requirements were later met by the Enterprise Digital Assistant (EDA) Motorola Symbol MC 50. Furthermore, Motorola service and repair facilities are situated in the Czech republic. Concerning service repairs, CZSO decided to choose the Motorola repairs "Service from the Start with Comprehensive Coverage", i.e. that in case of a damage of the HW the new one is delivered within 24 hours on spot of accidance. It is very important that price collector is never encountered with a missing HW.

    1.3. Software requirements

        Up to implementing mobile technology the field statisticians used pencil and paper forms, then transcribed the data into a SW written in MS FoxPro database management system (DBMS), then another person in district statistical office despatched the data through Wide Area Network (WAN) into the headquarters where another person summarized all the transmissions

until they came from all the districts, then heaps of paper sheets containing all data were printed and given to a special team using coloured pensils, rules, and their own estimates to reveal suspicious data occurrences. Phone consultancies with price collectors followed. The data collectors had to remember or find in their papers the information to be explained. The correction was marked in the report sheet and put aside to be repaired in the database.

In 1996 Oracle DBMS was implemented in the price statistical section of the CZSO. The statisticians working in the headquarters learned to use simple SQL queries to simplify their work and make it of a high quality. It was a good start for later implementing of mobile technology.

Originally, CZSO planed to build up its own mobile solution with its own programming staff. A disaster in the form of 2002 floods revealed how naïve it was. Suddenly all the capacities had to solve other problems of how to maintain the office operable. CZSO realized that it is necessary to find a partner being able to operate on a professional bases.

The winner of a public tender proclaimed in 2003 was Microsoft´s solution partner Kvados, a.s.. whose primary activity is providing SW services in the field of mobile technology. Its unique solution of field data processing and transmitting branded myAvis™ was exactly what CZSO needed.

1.4. Outsourcing Costs

As CZSO considered evident that its price collectors will not need any desktop PC, office facilities and the like, it was evident that the costs of any moderate field PDA will be cheaper then maintaining an office for them. Furthermore, CZSO programmers could concentrate on their routine tasks and it will not be necessary to maintain a unique ad hoc and hence costly knowledge capacities tied with mobile technologies.

2. Implementation

2.1. Premises

In the beginning CZSO had to:

- know the aims to be achieved and to persuade field statisticians not to be opposed to them

- choose and buy appropriate hardware (it was 15 pieces of Compac iPAQ H3850 in 2000 pilot study)

- choose two employees being able to gain advanced HW and SW knowledge in the new agenda and consequently to provide the field statisticians appropriate training and internal hot-line services

2.2. Pilot study (2000)

In 2000 CZSO asked the above-mentioned company Kvados a.s. to help it in preparing a pilot study for implementing the new ways of collecting and transmitting CPI data.
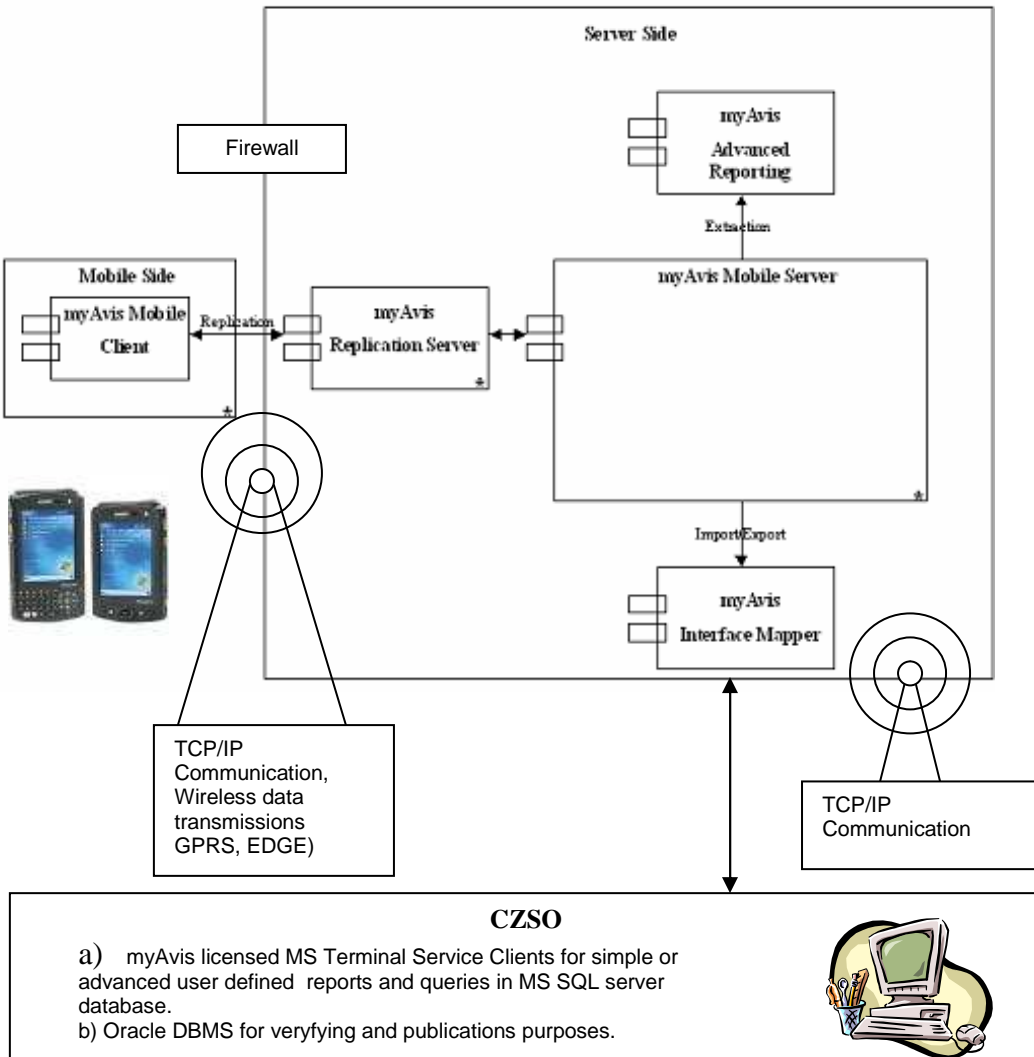
2.3. First own attempts (2001-2)

Everything seemed to be quite easy and CZSO was so self-confident that it has decided to start the project on a small portion of CPI agenda itself. After several weeks of simultaneous work both in old and new way a disaster of floods in 2002 came to reveal how naïve the chosen way was. Nevertheless, CZSO gained several useful practical knowledge of how the system works, what are the limiting factors.

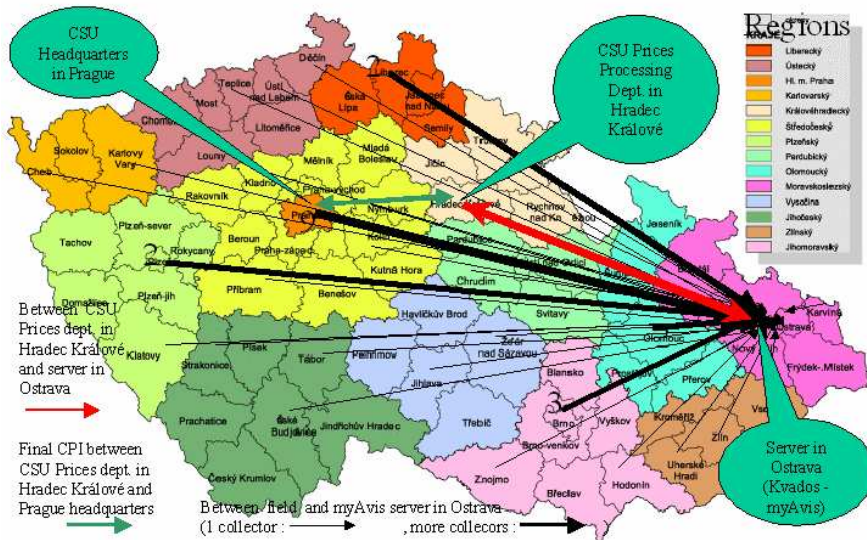### 2.4. Finding a suitable supplier (2003) and implementing the system

Potential suppliers were informed about opening a tender. The offer of Kvados, a.s. was considered to be the best one. CZSO has specified the details of the contract and gained adequate financial resources. On the 1st September, 2004 the new way of price statistician work was implemented. The price collectors were equipped with a more robust HW (Motorola Symbol MC 50). From that moment up to now CZSO has not encountered any serious problem in mobile computing of CPI.

2.5. Routine – data processing scheme

The following scheme works perfectly since 2004 in the sphere of price data collecting and consequent verifying procedures:

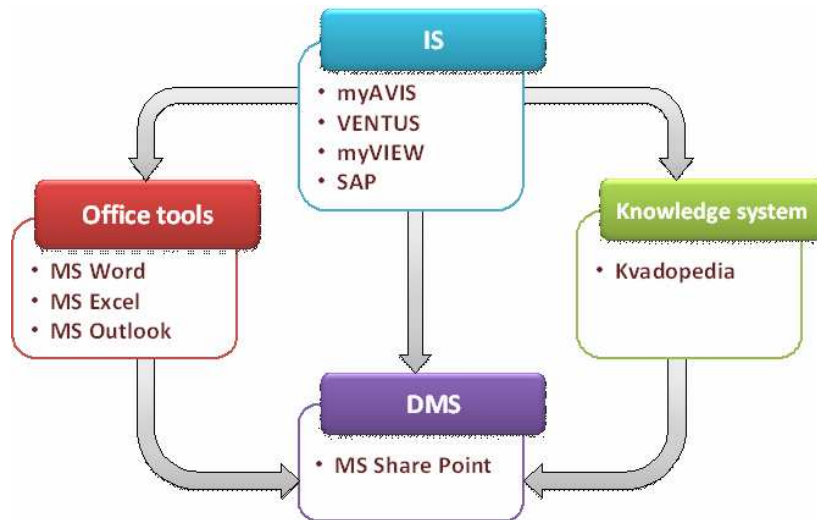**Internet transmissions in the CPI data processing:**

3. Results vs. general requirements

All the general requirements stated in point 1.1 have been attained. Transcribing faults have been eliminated, data processing period shortened, continuous way of data processing implemented, final CPI quality attained.

Statisticians work more effectively. It was possible to decrease number of verifying staff by two people. On the other hand another agenda could be added to well trained statisticians working in the field.

4. Plans for future

As the HW and SW mobile solutions evolve dramatically CZSO finds reasonable to keep pace with them. PDAs begin to be equipped with new sophisticated features, like GPS, scanners of bar codes, phone facilities. Some of them can substantially improve statisticians´ work. More detailed information can be supplied to and from price statistics collectors via internet. Kvados a.s., as CZSO solution supplier and Gold Microsoft solution partner is far from ceasing its activities in developing its IT services as can be seen from the following scheme:

MS SharePoint provides many features that can streamline CZSO processes. For instance InfoPath Forms Services technology could be used to create browser-based forms for gathering data from respondents who can complete the forms in Web browser or HTML enabled mobile devices.

Even with a pocket size PC the field price statistician can receive and despatch full-featured documents like e-mails and their enclosures in its pocket PC Outlook e-mail client. CZSO successfully tested and is prepared to lance this feature on a routine bases by means of Intellisync Mobile Suite distributed by Nokia, if the field statistician will be equipped with a suitable PDA having GSM module. E-mails, calendar, notes, tasks and contacts are synchronized periodically so as to keep the statistician in the field fully informed as seen below:

Price statisticians hardware equipment in the field

2001

iPaq 3850
Pocket PC 2002
206 MHz StrongArm
64 MB RAM / 32 MB ROM
Li-Ion 1400 mAh

2005

Symbol MC 50
Windows Mobile 2003 SE
Intel Xscale 520 MHz
64 MB RAM / 64 MB ROM
Li – Ion 1560 mAh

2011 ?

MOTOROLA MC55 technical specification:

Microsoft Windows Mobile 6.1

XScaleTM PXA270 520 MHz processor

128MB SDRAM/256MB Flash

Rechargeable Lithium Ion 3.7V, 2400 mAh Smart Battery

Bar code s canner

GPS module

GSM module (to be available in 2009)

CZSO is doing its best to keep pace with the above-mentioned fast evolving technologies in order to provide its statistical services efficiently and in a good quality.

Useful information:

www.myavis.com

www.motorola.com