Project Management in the State Sector
Implementation of a Centralized Information System

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1. SUMMARY

In the year 2011 was implemented a centralized solution of the Information System of Cadastre of Real Estates. The migration of data was the final step in the long lasting project that was initiated in 2006. The project was managed in cooperation Czech Office for Surveying, Mapping and Cadastre and private sector, which represents NESS Czech.

2. WHERE WAS ORIGIN?

The Czech land registration systems have been using information technology ever since the 1970's. However, it was only after the creation of the Cadastre of Real Estate in 1993, that information technology became an aid to all Cadastre staff. During 1997-2001, a principal quality change was made in order to develop a new information system based on an efficient database system covering all the data in a unified form and with an architecture allowing work with updated information at both local and central level.

During 1995-1996, a strategic concept for the Information System of Cadastre of Real Estates (ISCRE) architecture and solution had been elaborated by the Czech Office for Surveying, Mapping and Cadastre (COSMC). As the system integrator was selected, via public competition, the APP Czech (today's NESS Czech), which started working in 1997. The cooperation was for the respective COSMC staff the first time to learn, actually via the most complex departmental system, about the strict project methodology of a development of the system delivered by a supplier. The following development has being made via system integrator, which was always selected via public competition.

3. MAINTENANCE AND DEVELOPMENT

The Information System of the Cadastre of Real Estates (ISCRE) was launched in 2001. ISCRE consisted of the local databases and central database, their synergy and replication of elected data between them. From the beginning of solution development, the purposefulness of the system has still been emphasized by taking care of all aspects of the Cadastre administration, which has also been secured by the cooperation between the supplier and the consultants, i.e. individual department experts from the cadastral offices. They negotiate and specify the supplier's designs for the individual application solutions assess the results of verification of more complex application prototypes and assess the system users'

comments concerning its functionality. The ISCRE is used by nearly 5,000 employees in the entire Branch of the COSMC (Cadastral Offices, Cadastral Workplaces, Survey and Cadastral Inspectorates, Land Survey Office).

In July 2006 was compiled a Feasibility Study whether to retain the concept of synergy between the local and central databases or whether to switch over to a centralized system and then was made a decision to implement a centralized system. The primary plan was set by February 2009 and contained installation of a pilot technological infrastructure of the centre, execution of a test data migration of the centralized system and creation of the test data, testing of the functional ISCRE prototype and finalization of the program equipment, the system testing at a reference workplace, pilot run, data migration and launch of ISCRE.

4. HUMAN RESOURCES

The project is also operated by a team of experts from the sector COSMC. They are a project leader, a principal consultant, a test leader, a member of quality team, consultants, testers and technical support. The project leader, the principal consultant and the test leader works only on this project, for the others is this work only the part time job. Consultants and testers are regular employees in Cadastral Offices or Cadastral Workplaces.

5. PLANED SCHEDULE

The plan to centralize ISCRE was set for the 2007-2010 and consisted of two parts. The first was to buy hardware for providing centralized ISCRE and the second to change architecture of the ISCRE.

The planed schedule contained following milestones:

Specification of requirements (architecture, technology, HW)	January 07
Analysis (necessary changes, possible modifications)	
Prototype (user interface, technology)	February 08
Supplier selection (public competition)	
Prototype of solution	February 09
Practising of data migration	
Testing of the functionality	
Pilot run	
Verifying activity	January 10
Data migration and ISCRE startup	2.3.2010

The purchase of hardware had to be done via public competition in 2007, but the competition was cancelled. The contract to buy HW was signed, after next public competition, in January 2009, and the acceptance of delivery and training of administration lasted from March 2010 to January 2011. All these circumstances influenced the schedule.

Analysis of the necessary changes ISCRE and analysis of possible modifications were done by the end of 2007; a prototype of user interface was accepted in the end of first quarter 2008.

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In this way all was alright. But the development of the ISCRE closely related to technology issues, so the testing of functionality was launched only in August 2010. In that time was known, that the date of migration would change.

6. PROCESS OF WORK

6.1. TESTING OF THE FUNCTIONAL

Analysis included 55 necessary changes and 62 possible modifications. The testing was divided into 7 parts. Each part included implementation of changes, testing, evaluation and maintenance. Functionality testing was commenced in August 2010 (cf. plan). The standard number of testers working on the project was only six; therefore it was necessary increasing their number. Thanks to the initiative of the Cadastral Workplaces, it was succeeded.

The testing runs on the test data, which was created from backup of real data. The training helped debugging migration process, find required time and carry out verification of data.

6.2. VERIFYING RUN

In the first half of 2011 was twice managed complete training of data migration from 109 local databases into one central database. The training was carried out with the real data, so each of training affected all the Cadastral Workplaces. They had to interrupt their service for an afternoon. Migrated data was used for two verifying runs.

The first round was held from 10.3. to 31.5.2011. Approximately 120 users from 18 Cadastral Workplaces took part on it. They simulated providing service parallel with the real service, each step was done twice, firstly in the local system, secondly in the central system. The second round was held for 10 days from 4.7.2011.

6.3. STRESS TESTING

The goal of stress testing was to ensure that the common operation would perform in seconds and also that the software does not crash in unusually high concurrency. There were done two types of tests - the automatic stress tests and the user stress tests. The automatic stress test consisted in automatic generation of a large number of changes, which exceeded the normal operation. The numbers of types of tests were 23.

The user stress tests were based on the real work of employees. There were three Cadastral Workplaces involved in the first step. They launched forms, applications and reports. In the second testing step were involved all the Cadastral Workplaces. This test revealed fundamental problem in login more than 2000 users. To solve this problem were the tests repeated in next 5 dates (from 30.6. to 28.7.2011) and one to four times repetition in the date.

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6.4. DATA MIGRATION AND SYSTEM LAUNCH

Based on the results of the testing, verifying runs and stress tests second was made a decision to launch migration. The schedule was following

Decentralized ISCRE	
Exit of using ISCRE	Thu 11.8.2011, 15:00
Creation of printouts for verifying (property sheets, statistics)	Thu 11.8.2011, 16:30
Start data migration	Thu 11.8.2011, 20:30
Centralized ISCRE	
Launch ISCRE	Sat 13.8.2011, 06:30
Creation of printouts for verifying (property sheets, statistics)	Sat 13.8.2011, 08:30
Decision on successful migration	Sat 13.8.2011, 12:30
Migration of remote access	Sat 13.8.2011, 12:30
Decision on using centralized ISCRE	Sun 14.8.2011, 18:30
ISCRE come into operation	Mon 15.8.2011, 06:00

The verification consisted of manually comparing printouts from decentralized and centralized system, because although the content of printouts was not changed, the content of database was extended. The verification was carried out by employees of Cadastral Offices. 1% printouts of property sheets were checked, it took approximately six hours. The checking detected several errors, so the system had to be repaired.

The decision on using centralized ISCRE was published on Monday 15.8.2011, 1:30.

7. PRODUCT TRAINING

Each step in the project was accompanied by training of users. It comprised training before testing of the functional, verifying run and before launch centralized ISCRE also. The first trainings attended all participants on the central level, the trainings before launch system were provided in two levels – training of trainers from Cadastral Offices and training of end users from Cadastral Workplaces. The trainings were supported by user guidebooks and presentations with main changes between decentralized and centralized system.

8. CONCLUSION

The project management in the state sector has own specifics - a strict conditions of financing, procurement and ordering services, limited options to obtain human resources. The implementation of centralized ISCRE was finished in August 2011, more than one year after planed date. The debugging of the system ran till the end of the 2011.

The project to centralize ISCRE had a very wide range not only in changing the system, but also in an enormous number of people involved in it, what had to be combined with the need of minimum impact on the public sector and providing standard services. The project would not have been successful without the extraordinary activity of employees in testing, pilot runs,

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stress tests, and verification of data, and was influenced by positive attitude of all employees of the Branch of the COSMC.

The new architecture of ISCRE opened new possibilities in taking and transferring data, their management and using.

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