Applying GIS Technologies in Agriculture in Lithuania

State institution Agri Information and rural business center
Deputy head
Birutė Martuzevičiūtė
Director of IT department
direktorius Jurij Lavrinovič

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Information systems we manage and improve

- Livestock register
- Farming and rural business register
- Farm register
- Milk quota premium information system
- Breeding stock information systems (developing sheep and goat breeding systems)
- Cooperative farming registration system
- Horse breeding information system
- Dairy cattle breeding association database
- Tractor, self-propelled and agricultural machinery register
- Milk quota trade system
- Information system of milk wholesaler data
- Agricultural and foodstuffs market information system
- Parcel declaration system
- Forage producers register
- Genetic evaluation and analysis system
- Agriculture studies and consulting information system
Register and information systems
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Registers and information systems
ABOUT US

All register and information systems are created and improved by AGRO-INFORMATION AND RURAL BUSINESS CENTER staff.

DEPARTMENTS:

Ø LIVESTOCK AND MILK QUOTA (RECORD) DEPARTMENT
Ø AGRICULTURAL ENTITY AND MACHINERY REGISTER DEPARTMENT
Ø GIS UNIT
Ø UNIT OF MARKET INFORMATION AND ECONOMIC ANALYSIS

IT DEPARTMENT

SUPPORTING DEPARTMENTS:

Ø GENERAL INFORMATION SERVICE UNIT
Ø MAINTENANCE UNIT
Ø FINANCE DEPARTMENT
Ø PRINTING UNIT
Ø DOCUMENT MANAGEMENT UNIT

All this is AGRO - INFORMATION AND RURAL BUSINESS CENTER, the driving force in solving any problems and accomplishing the most challenging tasks set by Ministry of Agriculture and achieving excellent results.
IT evolution

1999 Contractors design information systems

2002 Reorganized AIRBC uses Borland Delphi and Oracle for application development

2008 All applications are developed using Microsoft .NET technology

2009 Programming, testing and production environments are completely separated

2010 Using ESRI GIS server and Silverlight for GIS application development

2011 GIS applications are upgraded using GIS server

2012 – 2014 Under development
IT TECHNOLOGIES ARE USED FOR

- Database maintenance
- Software creation
- Implementation of GIS solutions
- Other purposes
Crucial issue - efficiency of servers and data storage
To ensure information security the main and reserve server rooms have been equipped. They provide security and ensure information availability in case of technical failure.
All AIRBC information is kept in highly reliable storage units using RAID technologies. The storage units in the main server room are synchronized with the reserve server storage room to ensure information security.
All the systems are clustered and their nodes are located in the main and reserve server rooms. In case of failure, the other cluster node starts functioning.

Regular automated backups ensure information security
Connection security and efficiency are very important

AIRBC uses BGP, which ensures stable connection since there are two duplicate Internet lines from different Internet providers. In case of connection problems in one of the lines, all bandwidth is provided by the other one.

For data exchange State secure network and encoded channels are used. Segmentation of all the internal networks and use of firewalls protect the internal networks. Optical network solutions are extensively used.
PARCEL DECLARATION SYSTEM IS THE MOST REMARKABLE ACHIEVEMENT
HISTORY OF PARCEL DECLARATION

1999 - First declaration, GIS used only for reports
2001 - LPIS starts in 2 pilot regions
2002 - First LPIS version
2003-2009 - Paper maps printed for parcel declaration
2006-2008 - Pilot projects of electronic parcel declaration system
2009 - First partly electronic declaration
2010 - 100% electronic parcel declaration
2011-2014 - Maintenance and improvement of declaration system in accordance with legislation amendments
1999 - the beginning

The first steps were made in 1999.
Applications collected by Agricultural consulting service
No GIS or maps
First on-the-spot checks
Declarations are submitted in the National Land Service.
Preparations for the first map fragments
Printing the first map fragments in municipalities.
Client program using ESRI, developed in AIRBC
Since 2004 the majority of map fragments printed in AIRBC, the rest of fragments printed in municipalities
Fields drawn by hand by the Land Service staff
2006 - 2008

2006 - the first Pilot project in 15 parishes (not mandatory declaration)

2007 - second pilot project
q mandatory electronic declaration in 24 parishes
q 16 farmers
q 3 agricultural enterprises
q 35 land services

2008 – the last pilot project
q 338 parishes
q 191 farmers
q 29 enterprises
q 50 municipalities
q 17 land services
Since 2009 AIRBC has been responsible for parcel declaration. In 2010 it was decided that all applications for parcel declaration have to be electronic, paper forms were rejected.

A map fragment is part of an application, therefore in 2010 it was decided to eliminate map fragments from application forms and submit them electronically instead. All application data are transferred electronically to the National Paying Agency under the Ministry of Agriculture.
2010 – 2011

Preparations for the 2011 parcel declaration

This stage offers possibilities for making an application for declaration without being approved. Additional features:

– make a new application based on the application of the previous year;
– make corrections to the parcel boundaries drawn in 2010;
– generate and print map fragments for applications that have not been approved yet;
– use real estate cadaster data of the Lithuanian Republic, on-the-spot check data collected by the National Paying Agency and the drawn parcels the previous year.

The most active users:

Vilnius district municipality (more than 4,000 applications), Tauragė district municipality (2,700 applications), Kaišiadorys district municipality (2,500 applications), Šilalė district municipality (2,400 applications)
2010 – 2011

2011 preparations statistics
Economic value for each farm provided in the parcel declaration system offers the possibility of predicting taxes.
USER INTERFACE

We try to ease work for our users and make convenient and understandable instruments
Cutting fields by other layers

Cutting by other objects:
1. land block boundaries;
2. neighboring fields;
3. personal fields.

Split a field by:
1. land block boundaries
2. Natura 2000
3. Natura 2000 in the forests
4. risk territories
5. swamps
USER INSTRUMENTS

Ecologic buffer or its part

Upload GPS measurements

Editing

Displaying area and distances
USER INSTRUMENTS

Cut and split fields

Flexible measurement possibilities

We try to provide new appropriate instruments
In time provided error messages and warnings offer the possibility of avoiding positional sanctions and make application processing faster and more comfortable...
Cross checks
Cross checks
Errors reported in due time
To help farmers...
### Additional information for other information systems

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Valdoje mėsinių gabvijų ir avų nėra
For other state institutions
MAIN TASK

How can we serve 1000 active users at the same time?
Finding solution

Load balance

Application server

Document server

GIS server
PRODUCING RESPONSE

Load balance
The information system of agricultural analysis offers the possibility of seeing LPIS information, changes, history and the statistical information of municipalities and parishes using GIS tools.
Information system of agricultural analysis

We show territorial boundaries and addresses
Information system of agricultural analysis
Information system of agricultural analysis
Thanks for attention