



e-census

2011 MODERN CENSUS IN POLAND

CASE STUDY

Janusz Dygaszewicz

[e-mail: j.dygaszewicz@stat.gov.pl](mailto:j.dygaszewicz@stat.gov.pl)

Central Statistical Office of Poland

Programming and Coordination of Statistical Surveys Department

The project timetable

National Population and Housing Census 2011

2007
Start of
preparation

IV-V.2010
Trial census
NSP 2011

IV-VI.2011
NSP 2011



IX-X.2009
Trial Census
PSR 2010

IX-X.2010
PSR 2010

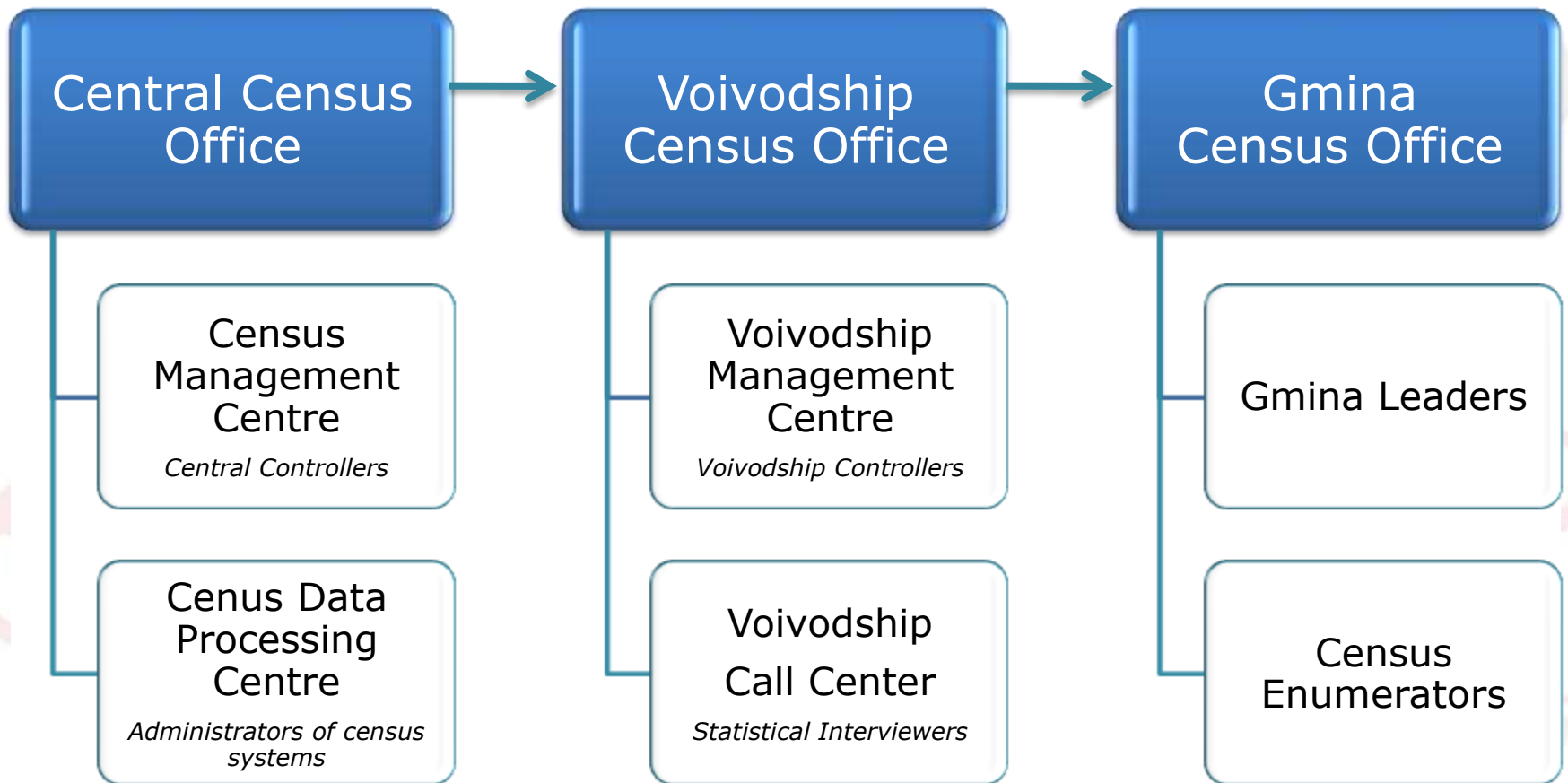
2013
End of
project

Agriculture Census 2010

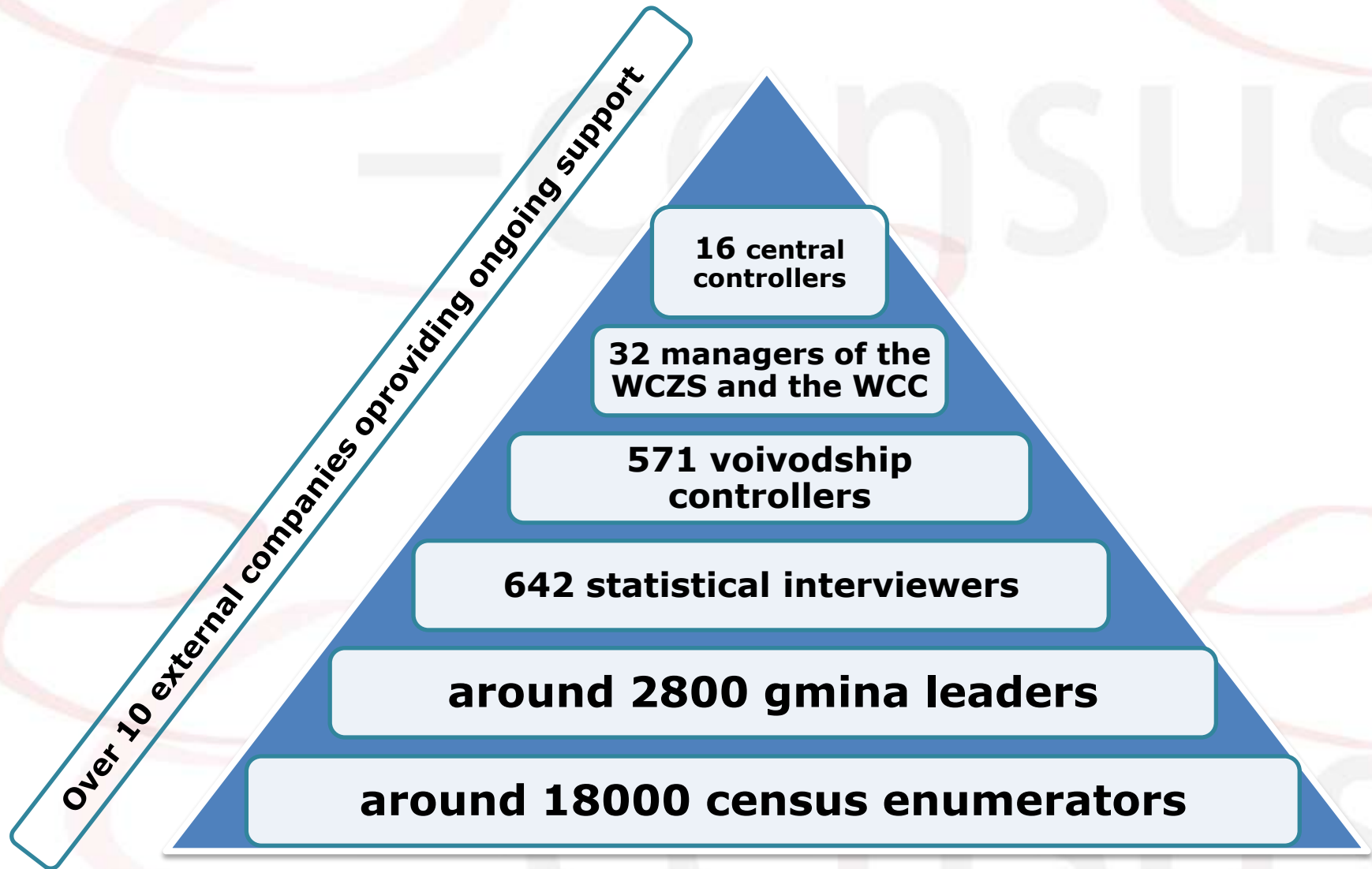


Census organisation

Organisation structure of census



Organization NSP 2011



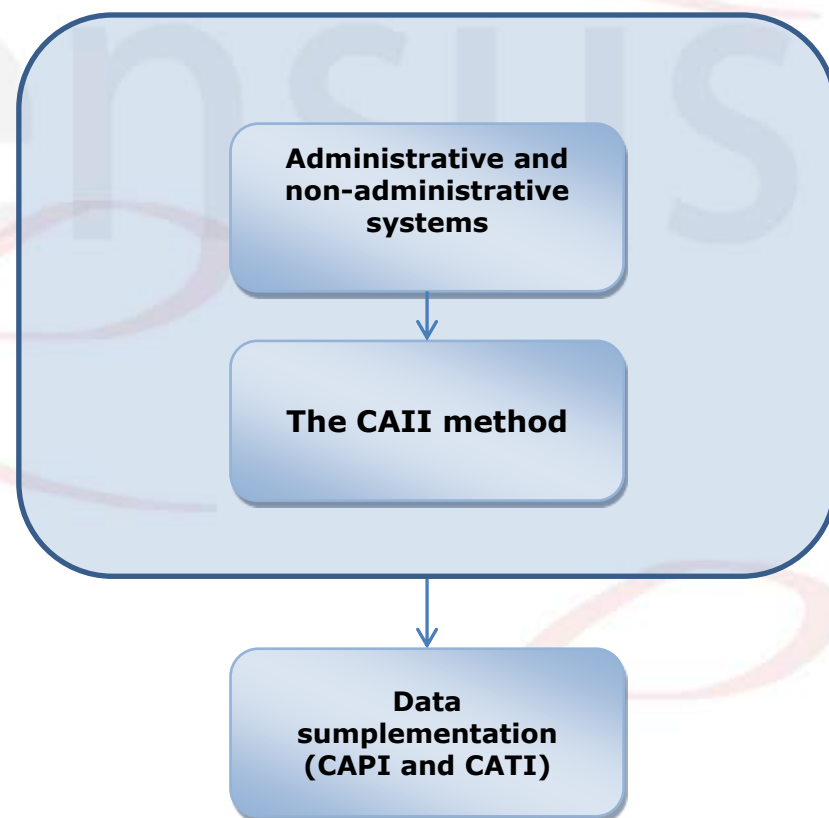
Mixed Model for Population and Housing Census

Mixed model - a combination of data from administrative sources (full survey covering base demographic variables) with data acquired from ad-hoc 20% sample survey.

NSP 2011 – full scale survey (15 questions)

Full-scale survey:

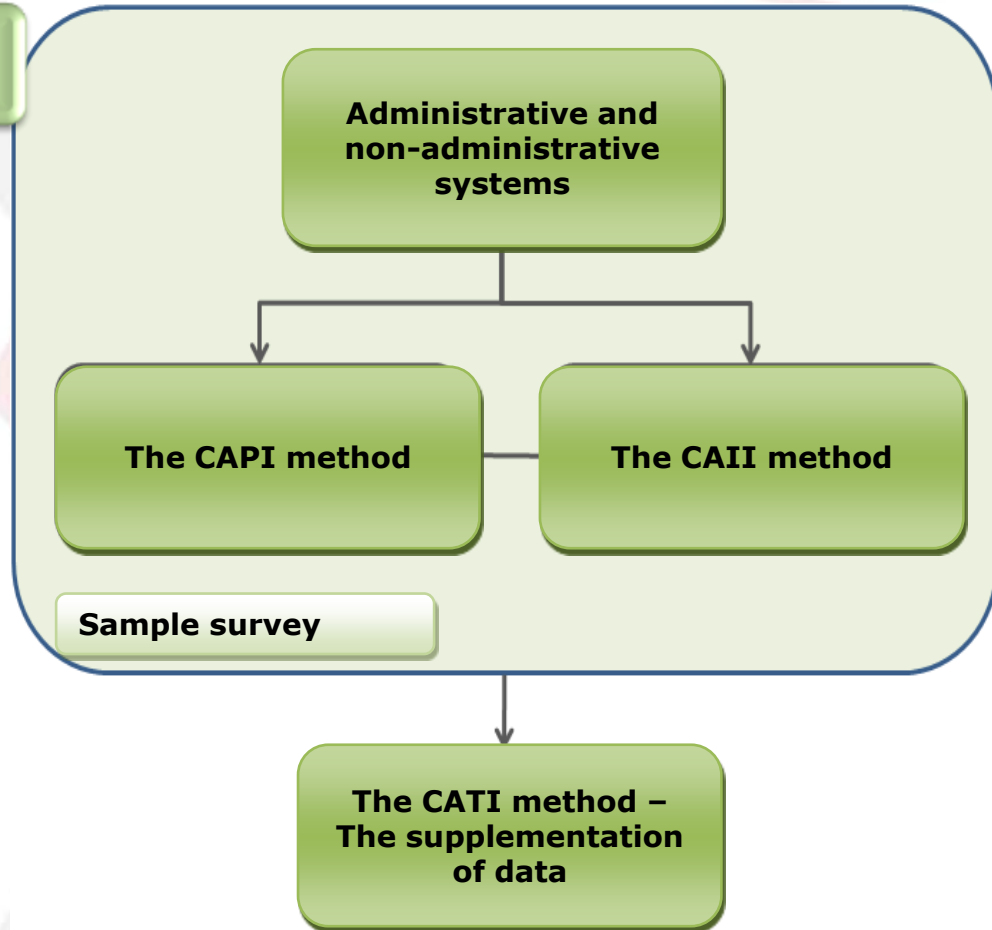
- 1) Data from administrative register – Master Record
- 2) Data acquired using the CAII method
- 3) Data supplemented using CATI and CAPI method



NSP 2011 – sample survey (about 100 questions)

Sample survey:

- 1) Data from administrative register – Master Record
- 2) Data acquired using:
 - The CAII method
 - The CAPI method
- 3) Data supplemented using CATI method



Data collection channels in 2010 Census Round

Administrative Sources

- Including spatial data reference registers

Self-enumeration by Internet

- **CAII** – Computer Assisted Internet Interview

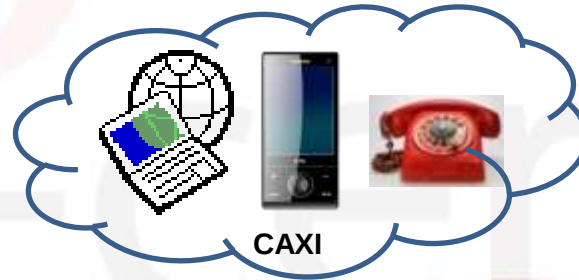
Telephone Interview

- **CATI** - Computer Assisted Telephone Interview

Interview with respondents executed by the census enumerators

- Registered on hand-held terminals with usage GPS and GIS service
CAPI - Computer Assisted Personal Interview

CAXI



CAXI

- CAIL - Computer Assisted Internet Interview,
- CAPI - Computer Assisted Personal Interview,
- CATI - Computer Assisted Telephone Interviewing.

Registers - data acquisition

Data Owners:

- Ministry of Finance,
- Ministry of Interior and Administration,
- Ministry of Justice,
- Agricultural Social Insurance Fund,
- National Health Fund,
- Agency for Restructuring and Modernisation of Agriculture,
- Agricultural and Food Quality Inspection,
- Agency for Geodesy and Cartography,
- State Fund for Rehabilitation of Disabled Persons,
- County Offices,
- Commune Offices,
- Regional Offices,
- Telcoms,
- Energy Suppliers,
- Office For Foreigners,
- Social Insurance Institution,
- Housing Managers,



The use of administrative sources in censuses

- The usage of administrative sources during the census:
 - direct source of research data ,
 - source of information to create a list of entities covered by the census frame (address-housing survey) ,
 - in addition, a source of information for :
 - imputation,
 - data estimation,
 - comparison the quality of the data.

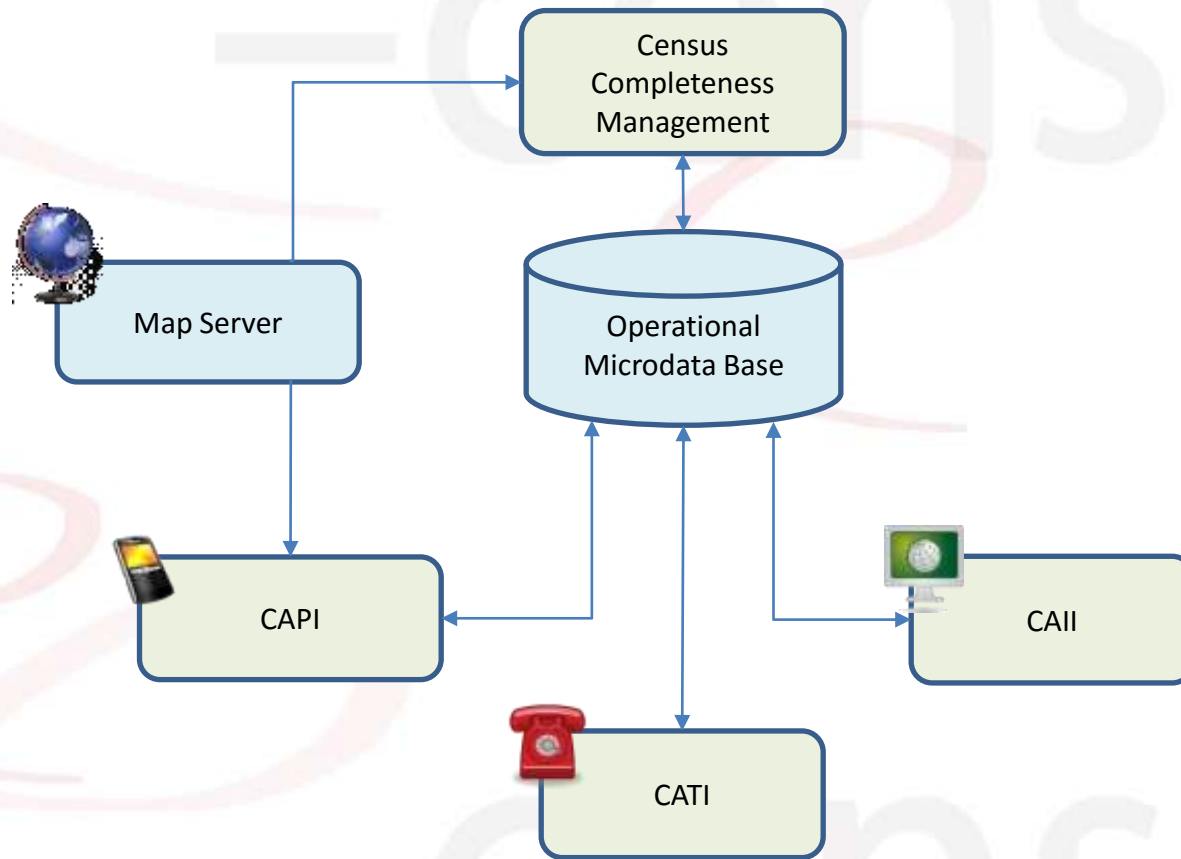
Administrative sources

- The process of data processing started from collecting administrative sources from data administrators' registers in the field defined by the appropriate legal Acts. The Polish statistics has the right to access all unit data stored in information sources of the public and commercial sectors. The obtained data include necessary identifiers and personal data supporting the process of merging (linking) unit data from different sources.

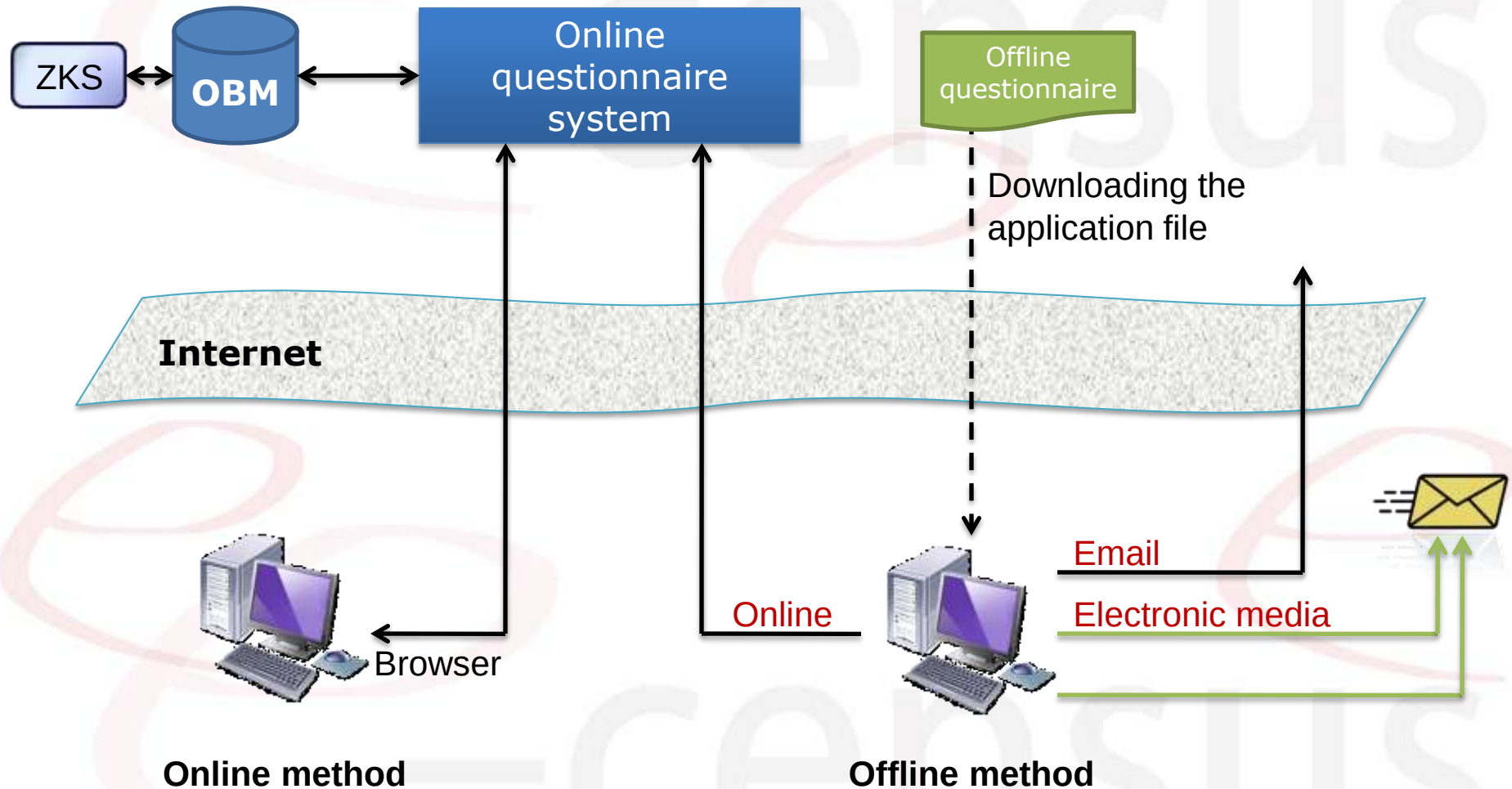
Administrative sources

- The unit data obtained from registers are converted into statistical registers, simultaneously being subject to the process of cleaning, de-duplication and standardisation of data. The process is carried out in the DQS SAS environment. At the same time, metadata are collected on the quality of input data obtained from registers, the applied cleaning procedures and the final quality obtained after applying DQS procedures.
- The cleaned data are loaded onto the Operational Microdata Base as successive logical layers corresponding to the obtained registers.

On-line channels for data collection System Architecture



CAII method system



Self-enumeration by Internet

filling the questionnaire by the respondent

- **Identification**

Used to confirm the identity of the respondent.

- Entering identification data in a questionnaire(f.ex.: PESEL, NIP, first name, last name) or additional authentication qualities (f.ex. a place of birth, mother's maiden name)
- Establishing a password which jointly with PESEL was the basis of authentication within 14 days

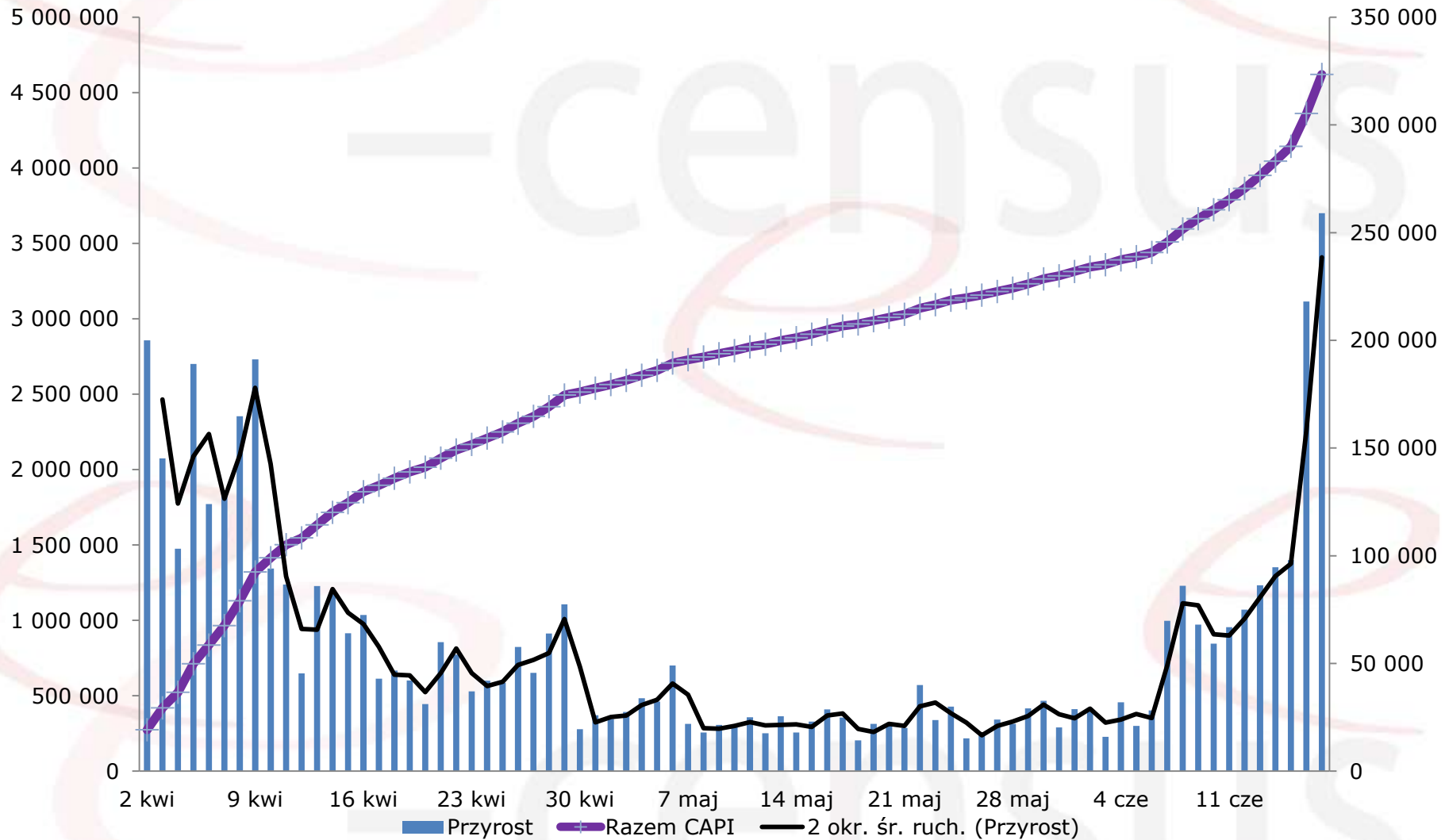
Self-enumeration by internet course of action in completing the survey by person

In case of full scope survey person fulfilled his/her questionnaire , and could also specify adults who lived in the same apartment

In case of sample survey the dwellings questionnaires were completed in the first place. Later were fulfilled personal questionnaires.

After completion of the authorization process the census form was available for 14 days.

Self enumeration trend

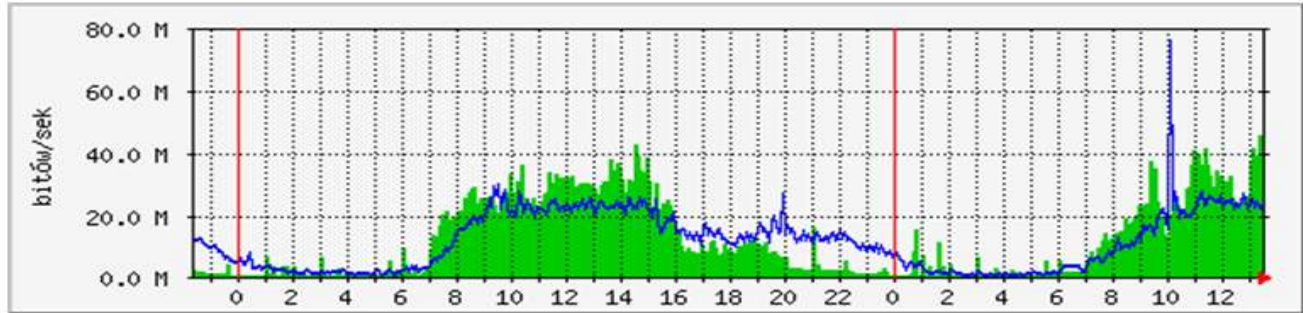


Typical person using selfenumeration

- ☐ **A man**
- ☐ **Age: about 24 years old**
- ☐ **A city inhabitant**
- ☐ **Secondary degree**

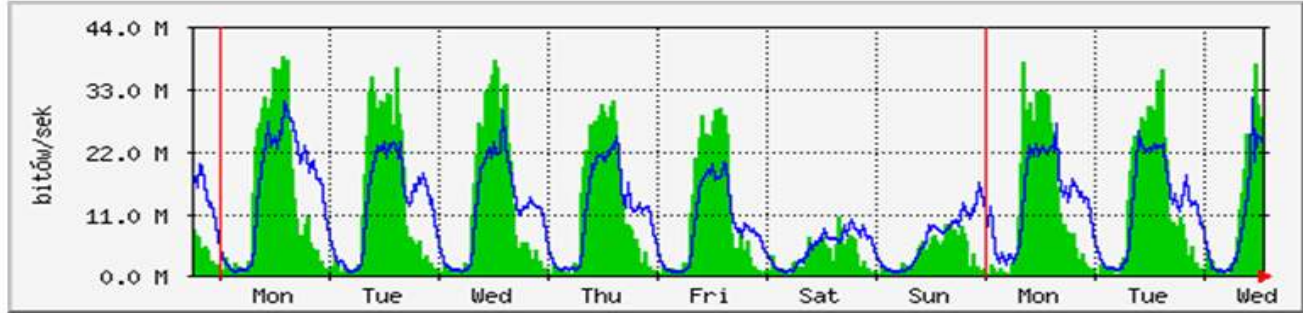
Ostatnie uaktualnienie statystyki **Środa dzień 25. Maj 2011 o godzinie 13:30**,
gdy 'r-ext1' był włączony przez **6:50:23**.

'Dzienny' Graf w ciągu (5 Minut/y - Średnio)



	Maksymalnie	Średnio	Aktualnie
Do	45.1 Mbit/s (4.7%)	11.4 Mbit/s (1.2%)	35.2 Mbit/s (3.7%)
Z	75.5 Mbit/s (7.9%)	11.1 Mbit/s (1.2%)	23.1 Mbit/s (2.4%)

'Tygodniowy' Graf w ciągu (30 minut - Średnio)



	Maksymalnie	Średnio	Aktualnie
--	-------------	---------	-----------

CATI – Computer Assisted Telephone Interview

- scheduled as the first or the second (following CAPI) channel of collecting data;
- working posts of telephone interviewers - located in separated Call Center studies;
- telephone interviewers - provided with professional equipment.

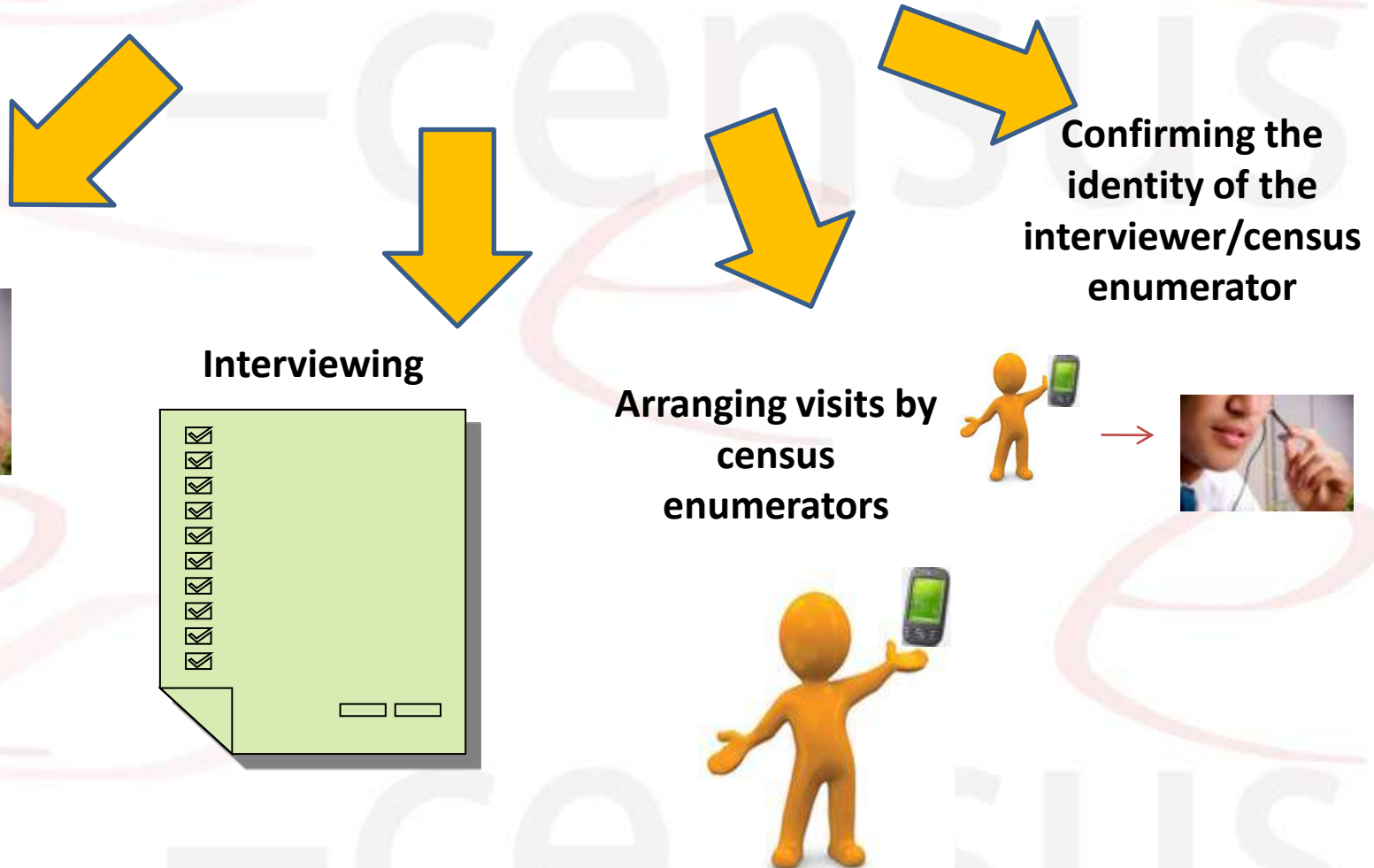
CATI in National Census 2011

- **16 distributed Call Centers**
- **320 SIP Stations**
- **642 telephone interviewers/consultants**
- **technology Interactive Intelligence**
- **utility applications prepared by CSO in Poland**

**The system worked from 8.04 to 30.06
(84 days) in hours 8.00 – 20.00/2 shifts**

Hotline 0 800 800 800 or (22) 44 44 777

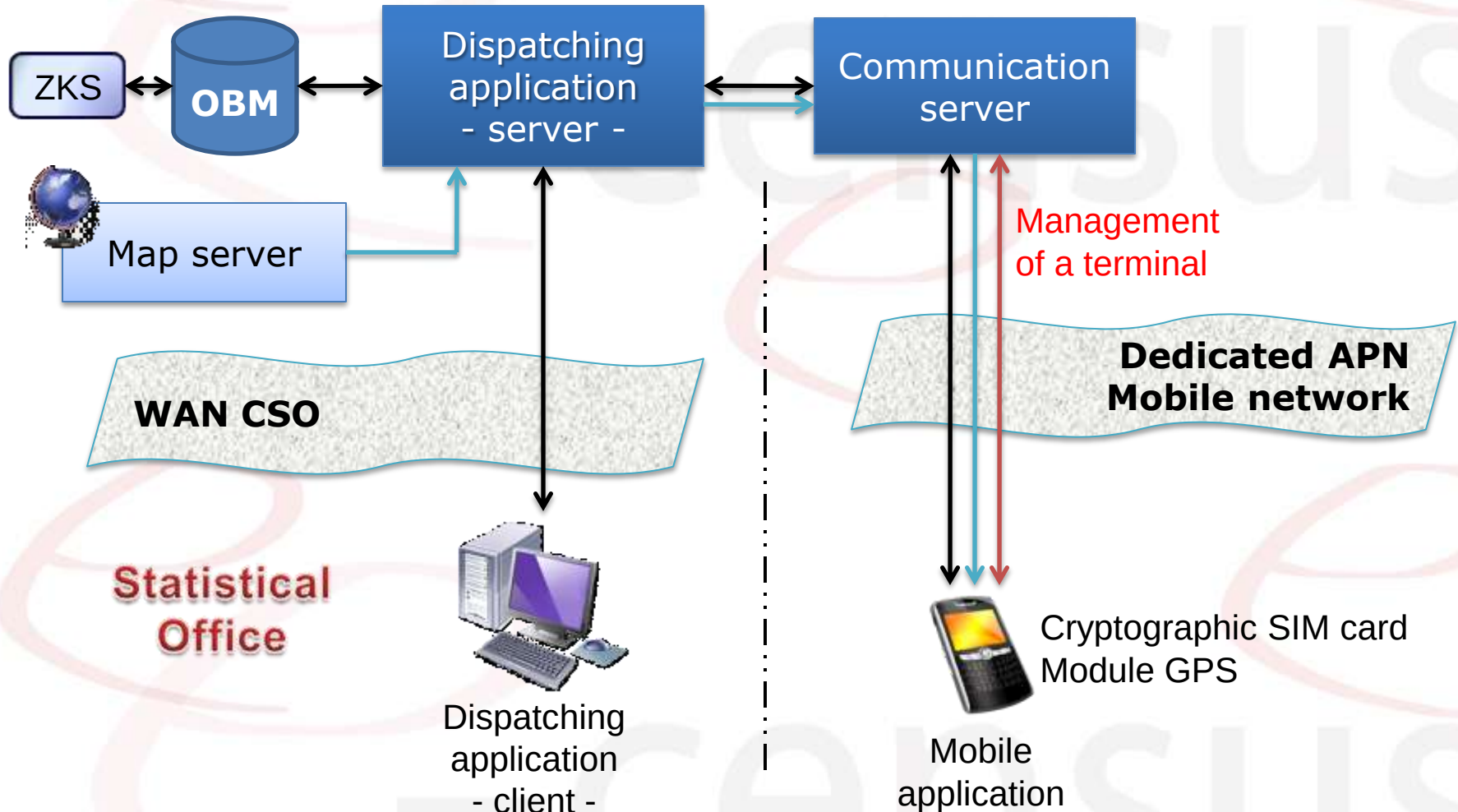
The most significant functionality of Call Center



CAPI – Computer Assisted Personal Interview

- the third channel of data collection in the case of failure to obtain a complete set of data via CAPI and CATI channels
- direct interviews in households (first or second channel)
 - where such a way of proceeding results from adopted methodology or
 - whose members has not expressed consent for a telephone survey

CAPI method system



Field enumeration management Supervisor - NUTS2 level

Responsibilities:

- Address Point and Census Area management
- Enumerator monitoring
 - Census Progress
 - Localization and trail
- Emergency situation management
 - Providing help for enumerators
- Providing necessary information to enumerators

Mapa spisu

Filtry dla punktów adresowych

Województwo WARMIŃSKO-MAZURSKIE

Przed przekazaniem

Zamknięte

Powiat Elbląg

U rachmistrza

Poza CAPI

Gmina Elbląg (Gmina miejska)

Do decyzji

Zaznaczone

Rejon

Obwód

Rodzaj badania Wszystkie

Zestawy filtrów...

Odśwież (Ctrl+R)

Odśwież automatycznie Wyłączone

Tabela Mapa

Wyb.	Stan	Id jednostki	Rodzaj badania	Rejon	Obwód	Miejscowość	[R] Ulica	Nr domu	Nr lo
☐	Przypisany	11526593	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	19	6
☐	Przypisany	11526585	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	16	1
☐	Przypisany	11526583	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	15	7
☐	Przypisany	11526579	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	12A	6
☐	Przypisany	11542861	Badanie repr...	161010	2	Elbląg (miasto)	Grochowski...	43	
☐	Poza CAPI	11520965	Badanie repr...	160990	2	Elbląg (miasto)	Grochowski...	4A	4
☐	Poza CAPI	11520955	Badanie repr...	160990	2	Elbląg (miasto)	Grochowski...	3K	1
☐	Zaplanowany	11539088	Badanie repr...	160990	5	Elbląg (miasto)	Grochowski...	3A	
☐	Zaplanowany	11521647	Badanie repr...	161010	1	Elbląg (miasto)	Grochowski...	32	1A
☐	Zaplanowany	11521627	Badanie repr...	161010	1	Elbląg (miasto)	Grochowski...	35	7
☐	Zamknięty	11540377	Badanie repr...	160990	2	Elbląg (miasto)	Grochowski...	3M	6
☐	Zamknięty	11540371	Badanie repr...	160990	2	Elbląg (miasto)	Grochowski...	3I	4
☐	Zamknięty	11521897	Badanie repr...	161010	2	Elbląg (miasto)	Grochowski...	46A	1
☐	Zamknięty	11521652	Badanie repr...	161010	2	Elbląg (miasto)	Grochowski...	46	1
☐	Zamknięty	11521651	Badanie repr...	161010	2	Elbląg (miasto)	Grochowski...	44	3
☐	Zamknięty	11521645	Badanie repr...	161010	1	Elbląg (miasto)	Grochowski...	39	6
☐	Przypisany	11520960	Badanie repr...	160990	2	Elbląg (miasto)	Grochowski...	3M	7
☐	Przypisany	11530110	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	20	8
☐	Przypisany	11530114	Badanie repr...	161000	3	Elbląg (miasto)	Grochowski...	21	11
☐	Przypisany	11536213	Badanie repr...	161010	1	Elbląg (miasto)	Grochowski...	35A	5
☐	Przypisany	11521132	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	15	10
☐	Przypisany	11521145	Badanie repr...	161000	1	Elbląg (miasto)	Grochowski...	19	7
☐	Przekazany	11521648	Badanie repr...	161010	1	Elbląg (miasto)	Grochowski...	40A	
☐	Przypisany	11521626	Badanie repr...	161010	1	Elbląg (miasto)	Grochowski...	35	6
☐	Przekazany	11543508	Badanie repr...	160830	2	Elbląg (miasto)	Grottgera (...)	74	4
☐	Przekazany	11508495	Badanie repr...	160822	6	Elbląg (miasto)	Grottgera (...)	71	1
☐	Przekazany	11504312	Badanie repr...	160830	3	Elbląg (miasto)	Grottgera (...)	10	1
☐	Przekazany	11529260	Badanie repr...	160821	3	Elbląg (miasto)	Grottgera (...)	11	2
☐	Przekazany	11529259	Badanie repr...	160821	3	Elbląg (miasto)	Grottgera (...)	11	1
☐	Przekazany	11529256	Badanie repr...	160821	3	Elbląg (miasto)	Grottgera (...)	3	2
☐	Nieprzypisany	11509877	Badanie pełne	160830	3	Elbląg (miasto)	Grottgera (...)	34F	
☐	Przypisany	11535259	Badanie repr...	160830	3	Elbląg (miasto)	Grottgera (...)	30	
☐	Przypisany	11535258	Badanie repr...	160830	3	Elbląg (miasto)	Grottgera (...)	26	
☐	Przypisany	11511205	Badanie repr...	160840	2	Elbląg (miasto)	Grottgera (...)	100	2
☐	Przypisany	11511204	Badanie repr...	160840	2	Elbląg (miasto)	Grottgera (...)	100	1
☐	Przekazany	11541509	Badanie repr...	160830	3	Elbląg (miasto)	Grottgera (...)	4	3
☐	Przekazany	11541506	Badanie repr...	160830	3	Elbląg (miasto)	Grottgera (...)	2	2

☐ Zaznacz/odznacz wszystkie Zaznaczonych punktów: 1

Zlokalizuj

Obsługa punktów w CAPI

Obsługa automatyczna

Komunikaty...

Dane punktu

Dostępni rachmistrze

Zdarzenia

Znajdź punkt...

Województwo

28

WARMIŃSKO-MAZURSKIE

Powiat

2861

Elbląg

Gmina

2861011

Elbląg

Miejscowość

Elbląg (miasto)

Ulica

Giermków (ul.)

20

4

Opis nieruchomości

Lista osób

Aktualne zadanie w punkcie - dane rachmistrza

Identyfikator

2861011/R036

Imię

Ewelina

Nazwisko

Numer telefonu HH

797216247

Numer telefonu prywatnego

Inny numer telefonu

Aktualne zadanie w punkcie - szczegóły

Status

Niezrealizowane

Stan umówienia

Brak umówienia

Ankiety...

Historia zdarzeń...

Mapa spisu

Filtry dla punktów adresowych

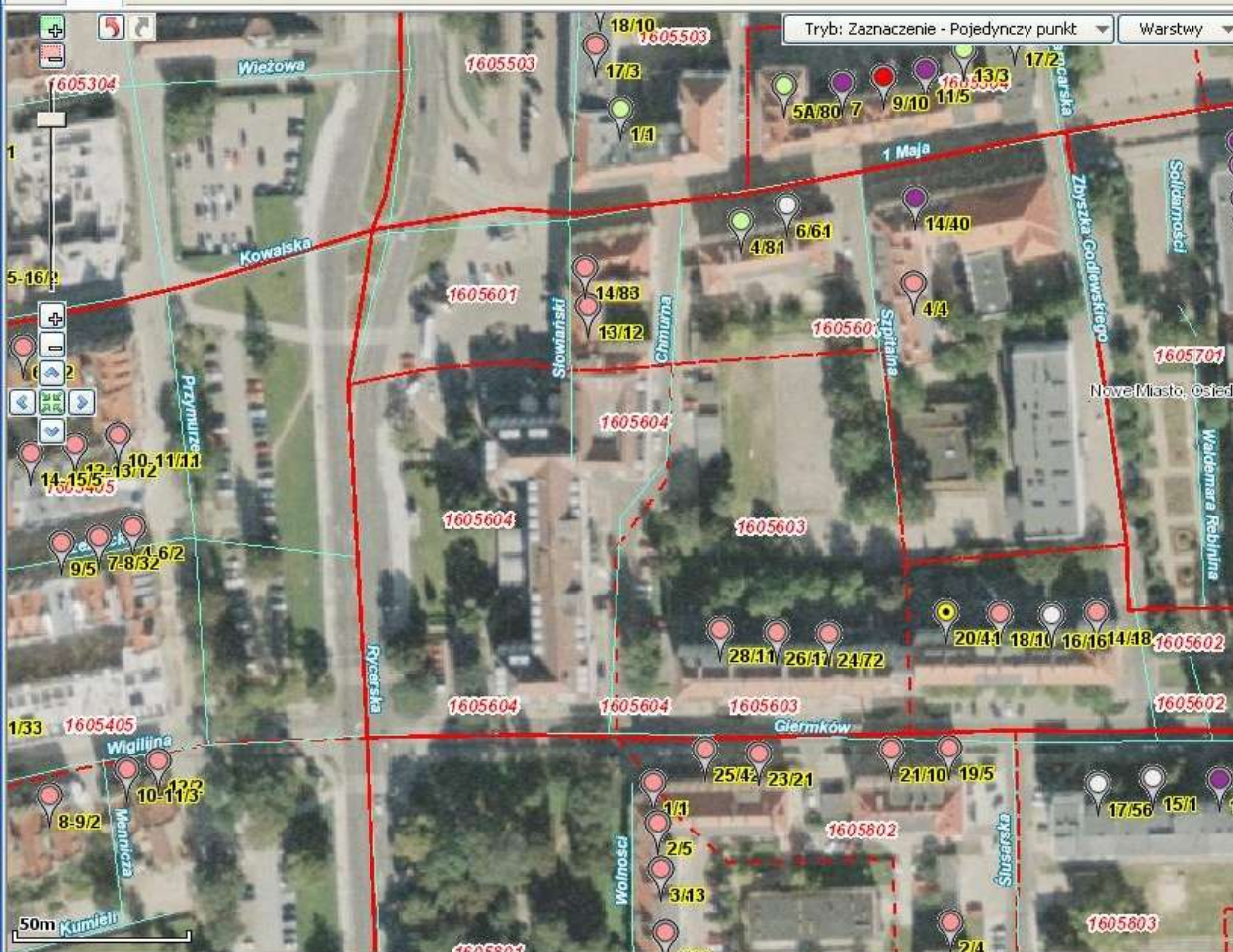
Województwo	WARMIŃSKO-MAZURSKIE	☒ Przed przekazaniem	☒ Zamknięte
Powiat	Elbląg	☒ U rachmistrza	☒ Poza CAPI
Gmina	Elbląg (Gmina miejska)	☒ Do decyzji	☒ Zaznaczone
Rejon		Rodzaj badania	Wszystkie
Obwód			

Zestawy filtrów...

Odśwież (Ctrl+R)

Odśwież automatycznie Wyłączone

Tabela Mapa


☐ Zaznacz/odznacz wszystkie Zaznaczonych punktów: 1

Zlokalizuj

Obsługa punktów w CAPI

Obsługa automatyczna

Komunikaty...

Dane punktu Dostępni rachmistrze Zdarzenia

Znajdź punkt...

Dane punktu adresowego - stan spisu

Stan punktu	
Przypisany	
Rodzaj badania	
Badanie reprezentacyjne	
Blokada CAPI	Blokada CATI
Nie dotyczy	Nie dotyczy
Powód blokady CAPI	
Powód blokady CATI	
Data ostatniej synchronizacji z OBM	

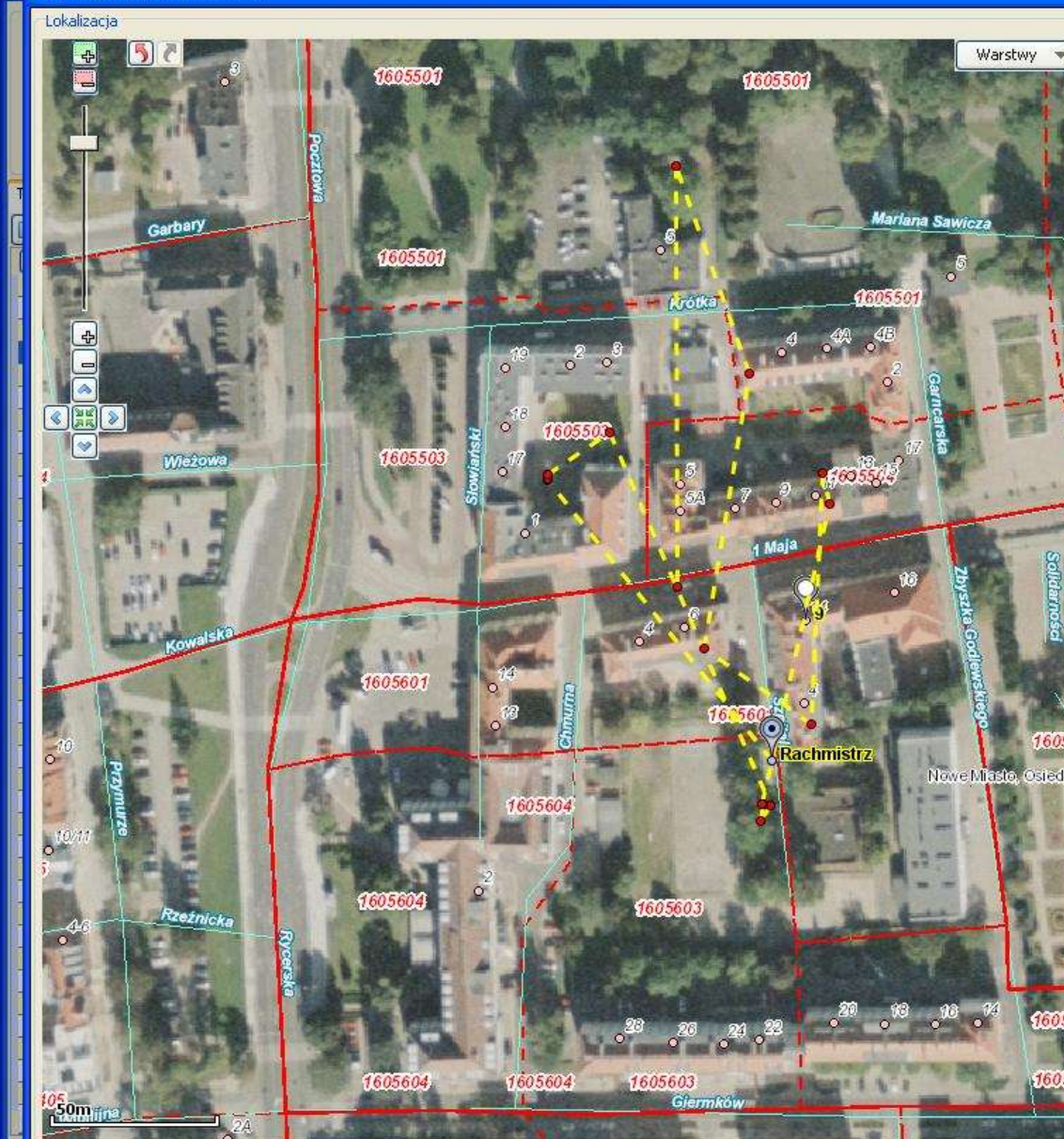
Dane adresowe punktu

Współrzędne geograficzne	
526179,35	699401,38
Województwo	
28	WARMIŃSKO-MAZURSKIE
Powiat	
2861	Elbląg
Gmina	
2861011	Elbląg
Miejscowość	
Elbląg (miasto)	
Ulica	
Giermków (ul.)	20 4
Opis nieruchomości	
Lista osób	

Ankiety...

Historia zdarzeń...

Lokalizacja rachmistrza



Dane rachmistrza

Imię Ewelina Nr tel. HH 797216247
 Drugie imię
 Nazwisko
 Id rachmistrza 2861011/R036
 Nr tel. prw.
 Nr tel. inn.

Dzień spisu

2011-04-18

Bieżąca pozycja

X Y Pobierz

Szczegóły

Punkty adresowe Marszruta Daty synchronizacji Parametry Terminala

Data	WspX	WspY	Zrodlo
2011-04-18 17:32:...	526160.36910415	699481.34542983	Odczyt niezależny
2011-04-18 17:27:...	526092.44673362	699566.73363201	Odczyt niezależny
2011-04-18 17:17:...	526092.44568521	699566.91901403	Odczyt niezależny
2011-04-18 17:07:...	526092.58428275	699568.06302355	Odczyt niezależny
2011-04-18 16:57:...	526111.29628948	699581.1769411	Odczyt niezależny
2011-04-18 16:46:...	526159.75694723	699467.77774079	699568.06302355
2011-04-18 16:44:...	526156.86622247	699462.69408139	Odczyt niezależny
2011-04-18 16:41:...	526157.65279116	699467.88940309	Odczyt niezależny
2011-04-18 16:41:...	526157.65314149	699467.82760909	Odczyt niezależny
2011-04-18 16:31:...	526157.38026713	699467.98055203	Odczyt niezależny
2011-04-18 16:21:...	526177.71511221	699559.46124961	Odczyt niezależny
2011-04-18 15:56:...	526175.45119055	699568.5633139	Odczyt niezależny
2011-04-18 14:38:...	526172.32988627	699492.25845789	Odczyt niezależny
2011-04-18 14:34:...	526139.93851685	699515.46460872	Odczyt niezależny
2011-04-18 14:21:...	526153.26452989	699599.02650964	Odczyt niezależny
2011-04-18 14:11:...	526131.16429989	699662.30397396	Odczyt niezależny
2011-04-18 13:57:...	526131.85445241	699534.05030393	Odczyt niezależny

Mapa spisu

dla punktów adresowych

województwo ZACHODNIOPOMORSKIE

☒ Nieprzypisane

☐ Zakończone

Powiat kołobrzeski

☐ Przekazane

☐ Anulowane

Gmina Kołobrzeg (Gmina wiejska)

☒ Do decyzji

☒ Zaznaczone

Odśwież (Ctrl+R)

Odśwież automatycznie Wyłączone

Kalibracja rachmistrza

izacja



Dane rachmistrza

Imię Małgorzata

Nazwisko Zięba

Drugie imię

Id rachmistrza P289

Nr tel. #1

Nr tel. #2

Dzień spisu

< 2010-03-21 >

Bieżąca pozycja

X 269792.04118063 Y 704483.17258663

Pobier

Szczegóły

Punkty adresowe Marszruta Daty synchronizacji

Data	X	Y	Źródło
2010-03-21 12:29:03.0	269792.04...	704483.17...	Odczyt niezależny
2010-03-21 12:28:58.0	269773.18...	704484.30...	Odczyt niezależny
2010-03-21 12:28:53.0	269754.87...	704484.06...	Odczyt niezależny
2010-03-21 12:28:48.0	269719.39...	704483.52...	Odczyt niezależny
2010-03-21 12:28:40.0	269706.18...	704481.64...	Odczyt niezależny
2010-03-21 12:27:34.0	269693.21...	704480.65...	Odczyt niezależny
2010-03-21 12:27:26.0	269689.59...	704491.13...	Odczyt niezależny
2010-03-21 12:27:18.0	269685.29...	704501.38...	Odczyt niezależny
2010-03-21 12:27:09.0	269680.72...	704511.08...	Odczyt niezależny
2010-03-21 12:27:01.0	269676.49...	704520.61...	Odczyt niezależny
2010-03-21 12:26:54.0	269672.86...	704530.82...	Odczyt niezależny
2010-03-21 12:26:48.0	269668.64...	704539.92...	Odczyt niezależny
2010-03-21 12:25:34.0	269664.57...	704549.96...	Odczyt niezależny
2010-03-21 12:25:24.0	269668.85...	704540.06...	Odczyt niezależny
2010-03-21 12:25:16.0	269672.95...	704530.17...	Odczyt niezależny
2010-03-21 12:25:07.0	269677.52...	704520.40...	Odczyt niezależny
2010-03-21 12:24:57.0	269681.35...	704510.62...	Odczyt niezależny
2010-03-21 12:24:40.0	269683.81...	704500.52...	Odczyt niezależny
2010-03-21 12:24:35.0	269689.51...	704487.33...	Odczyt niezależny
2010-03-21 12:24:30.0	269701.78...	704483.84...	Odczyt niezależny
2010-03-21 12:24:25.0	269716.40...	704486.67...	Odczyt niezależny
2010-03-21 12:24:20.0	269734.87...	704486.46...	Odczyt niezależny
2010-03-21 12:24:15.0	269755.17...	704486.90...	Odczyt niezależny
2010-03-21 12:24:10.0	269773.71...	704486.68...	Odczyt niezależny
2010-03-21 12:24:05.0	269792.17...	704484.74...	Odczyt niezależny
2010-03-21 12:23:58.0	269800.13...	704493.20...	Odczyt niezależny
2010-03-21 12:23:53.0	269798.05...	704512.52...	Odczyt niezależny
2010-03-21 12:23:48.0	269792.94...	704532.96...	Odczyt niezależny

Mapa spisu

Filtry dla punktów adresowych

Województwo

MAZOWIECKIE

Powiat

Warszawa

Gmina

Rembertów (Dzielnica w m.st. Warszawa)

Rejon

Obwód

Nieprzypisane

Przekazane

Do decyzji

Zakończone

Anulowane

Zaznaczone

Odśwież (Ctrl+R)

Odśwież automatycznie

Wyłączone

Statystyka obszaru działania...

Lokalizacja rachmistrza

Lokalizacja

Dane rachmistrza

Imię

Renata

Nazwisko

Drugie imię

Id rachmistrza

P107

Nr tel. #1

Nr tel. #2

Dzień spisu

<

2010-03-20

>

Bieżąca pozycja

X

Y

Pobierz

Szczegóły

Punkty adresowe

Marszruta

Daty synchronizacji

Data	X	Y	Źródło
2010-03-20 14:35:14.0	646981.72...	491139.56...	Odczyt niezależny
2010-03-20 14:34:46.0	647002.82...	491103.16...	Odczyt niezależny
2010-03-20 14:34:39.0	647007.76...	491093.57...	Odczyt niezależny
2010-03-20 14:34:32.0	647010.65...	491082.25...	Odczyt niezależny
2010-03-20 14:34:16.0	647018.84...	491074.95...	Odczyt niezależny
2010-03-20 14:34:07.0	647023.17...	491065.59...	Odczyt niezależny
2010-03-20 14:34:02.0	647032.42...	491047.23...	Odczyt niezależny
2010-03-20 14:33:44.0	647036.83...	491036.20...	Odczyt niezależny
2010-03-20 14:33:37.0	647047.43...	491037.42...	Odczyt niezależny
2010-03-20 14:33:31.0	647055.97...	491044.78...	Odczyt niezależny
2010-03-20 14:32:54.0	647072.25...	491064.40...	Odczyt niezależny
2010-03-20 14:32:45.0	647063.78...	491057.16...	Odczyt niezależny
2010-03-20 14:32:30.0	647054.98...	491051.58...	Odczyt niezależny
2010-03-20 14:32:21.0	647048.93...	491042.62...	Odczyt niezależny
2010-03-20 14:32:08.0	647040.62...	491035.05...	Odczyt niezależny
2010-03-20 14:31:52.0	647034.54...	491043.15...	Odczyt niezależny
2010-03-20 14:31:43.0	647040.49...	491032.39...	Odczyt niezależny
2010-03-20 14:31:36.0	647045.52...	491023.39...	Odczyt niezależny
2010-03-20 14:31:31.0	647053.14...	491010.63...	Odczyt niezależny
2010-03-20 14:31:19.0	647056.98...	491001.32...	Odczyt niezależny
2010-03-20 14:31:11.0	647064.00...	490992.53...	Odczyt niezależny
2010-03-20 14:31:04.0	647067.70...	490982.17...	Odczyt niezależny
2010-03-20 14:30:50.0	647075.15...	490974.10...	Odczyt niezależny
2010-03-20 14:30:22.0	647090.21...	490987.32...	Odczyt niezależny
2010-03-20 14:29:57.0	647083.01...	490979.99...	Odczyt niezależny
2010-03-20 14:27:59.0	647073.41...	490973.28...	Odczyt niezależny

Zaznacz/odznaczyć wszystkie

Zlokalizuj

Plan pracy rachmistrza...

Kalendarz rachmistrza...

Obsługa punktów w CAPI

Obsługa punktów nowych

Obsługa automatyczna

Komunikaty...

Dane niezmodyfikowane

Lokalizacja rachmistrza: Dzień spisu

Start

6 Mic...

3 Eks...

Bez tyt...

C:\WI...

ArcCat...

ASPIS ...

3 Int...

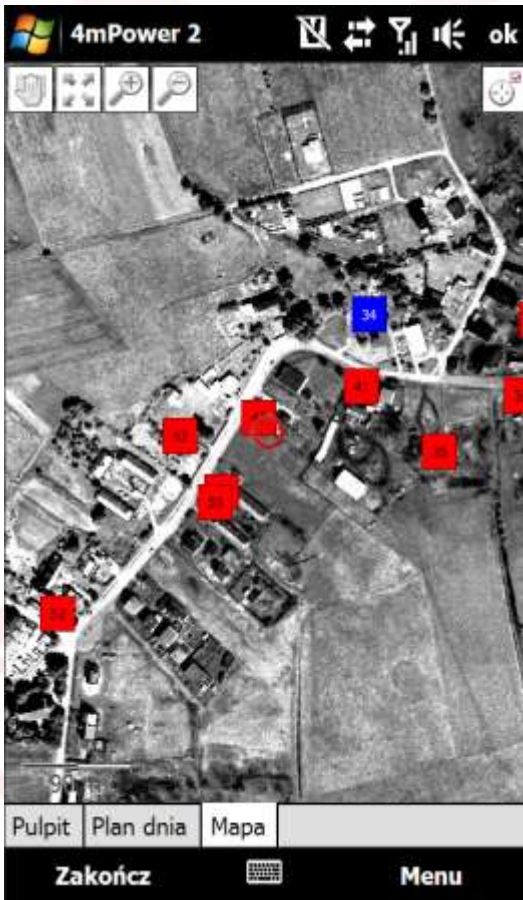
Dokum...

22.bm...

PL

17:20

Enumerator



- Map module - GIS
 - Ortophotomap
 - Cadastral Data
 - Assigned Tasks
 - Started Tasks
 - Completed Tasks

HH - Mobile terminal of enumerator with GPS

- HTC Touch Pro2
- Screen
 - touch-screen
 - size 3,6"
 - resolution 480 x 800 pixels
 - sliding, tilting - convenient usage
- sliding, 5-rows QWERTY keyboard
- GSM/GPRS/EDGE/UMTS/HSPA
- GPS module
- camera - 3,2 MP
- Windows Mobile® 6.5



Enumerator



- Visiting all assigned holdings
 - Filling electronic questionnaires
- Daily synchronisation
- Contact with the supervisor in terms of task scheduling
- Adding newly identified holdings

Enumerator

The image displays three screenshots of the 'Census Mobile' application interface, showing different screens and data.

Left Screenshot (Main Menu):

- Top bar: Census Mobile, status icons, OK button.
- Buttons: Połącz z dyspozytorem (Headset icon), Połącz z liderem (Person icon), Synchronizacja awaryjna (Red circular arrows icon), Alarm (Red exclamation mark icon), Wiadomości (Envelope icon).
- Bottom bar: Pulpit, Jednostki spisowe, Spotkania, Mapa. Below this: Zakończ, PL, Menu.

Middle Screenshot (Jednostki spisowe (15)):

- Top bar: Census Mobile, status icons, OK button.
- Section: Ulica Jednostki spisowe (15) (Green checkmark, Blue T icon).
- List of units (all in Warszawa):
 - skwer Sue Ryder 36 m. 8 (Yellow star)
 - skwer Sue Ryder 49 m. 8 (Yellow star)
 - ul. Altowa 64 m. 14
 - ul. Białobrzeska 19 m. 13 (Yellow star)
 - ul. Józefa Supińskiego 73 m. 4
 - ul. Lirowa 2 m. 12 (Yellow star)
 - ul. Łukasza Górnickiego 99 m. 7 (Yellow star)
 - ul. Maszynowa 90 m. 1 (Yellow star)
 - ul. Metrykantów 79 m. 10 (Yellow star)
 - Warszawa
- Bottom bar: Pulpit, Jednostki spisowe, Spotkania, Mapa. Below this: Zakończ, PL, Menu.

Right Screenshot (Spotkania (3)):

- Top bar: Census Mobile, status icons, OK button.
- Section: Spotkania (3) (Green checkmark, Blue T icon).
- Calendar view:
 - Wtorek 26 Kwiecień 2011**
 - Start pracy 08:00
 - 1. 15:30: Warszawa ul. Józefa Supińskiego 73 m. 4 (Document icon)
 - 2. 16:00: Warszawa ul. Altowa 64 m. 14 (Document icon, Green person icon)
 - Koniec pracy 20:00
 - 3. (godzina nie jest ustalona): Warszawa skwer Sue Ryder 36 m. 8 (Document icon, Yellow star)
- Środa 27 Kwiecień 2011**
- Bottom bar: Pulpit, Jednostki spisowe, Spotkania, Mapa. Below this: Zakończ, PL, Menu.

Enumerator

Census Mobile

skwer Sue Ryder 36 m. 8

- Gospodarstwo numer 1
 - jan kowalski
 - joanna kowalska
- Osoby poza gospodarstwem domowym
 - włodzimierz kowalski

L10.1a. Jaka jest Pana(i) narodowość? Przez narodowość należy rozumieć przynależność narodową lub etniczną - nie należy jej mylić z obywatelstwem

- ☐ 1. polska
- ☐ 2. białoruska
- ☐ 3. czeska
- ☐ 4. karaimska
- ☐ 5. litewska
- ☐ 6. łemkowska
- ☐ 7. niemiecka
- ☐ 8. ormiańska
- ☐ 9. romska
- ☐ 10. rosyjska
- ☐ 11. słowacka
- ☐ 12. tatarska
- ☐ 13. ukraińska

Przyczyna

- Brak mieszkania
- Mieszkanie niezamieszkane
- Nieobecność respondenta
- Odmowa spisu
- Odwołanie umówionego spotkania
- Spis w CAII
- Zaplanowanie spotkania w innym terminie

Relacje Gotowe

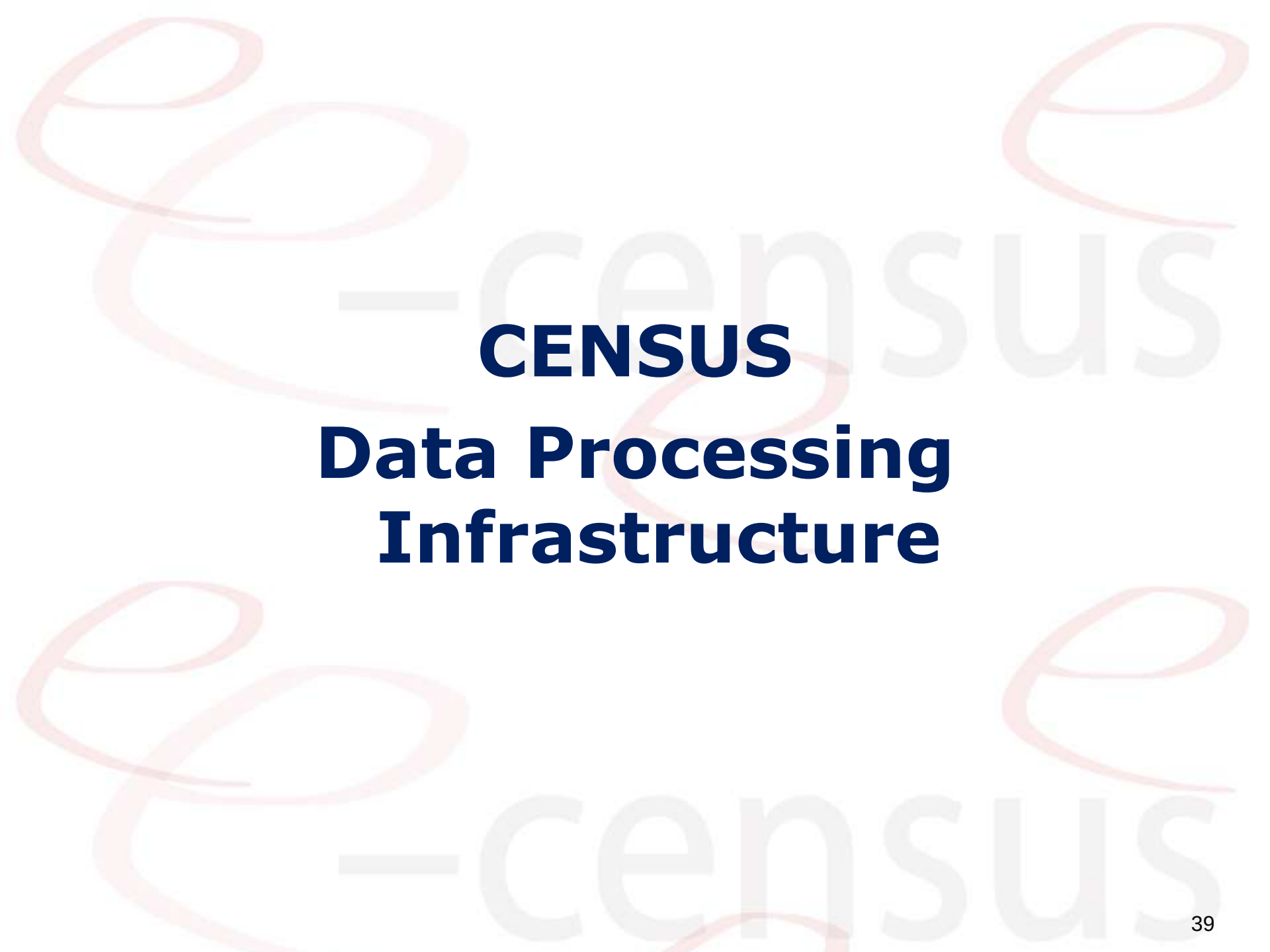
Ankiety 0 z 4

Powrót PL Menu Dalej PL Menu OK PL Anuluj

Enumerator



- Alarm procedure
 - In emergency situations, enumerators have a possibility of sending an alarm signal to their supervisors
 - Alarm notice is sent to the supervisor application and via SMS to the supervisor



CENSUS

Data Processing Infrastructure

The IT Census System

Census architecture

For the purposes of census design and conduction, the Central Statistical Office of Poland implemented **the IT Census System (ICS)**

The ICS integrated various technologies (from applications installed on mobile terminals, through applications managing and assisting in telephone interviews, to specialist bases, data warehouses and analytical and reporting tools)

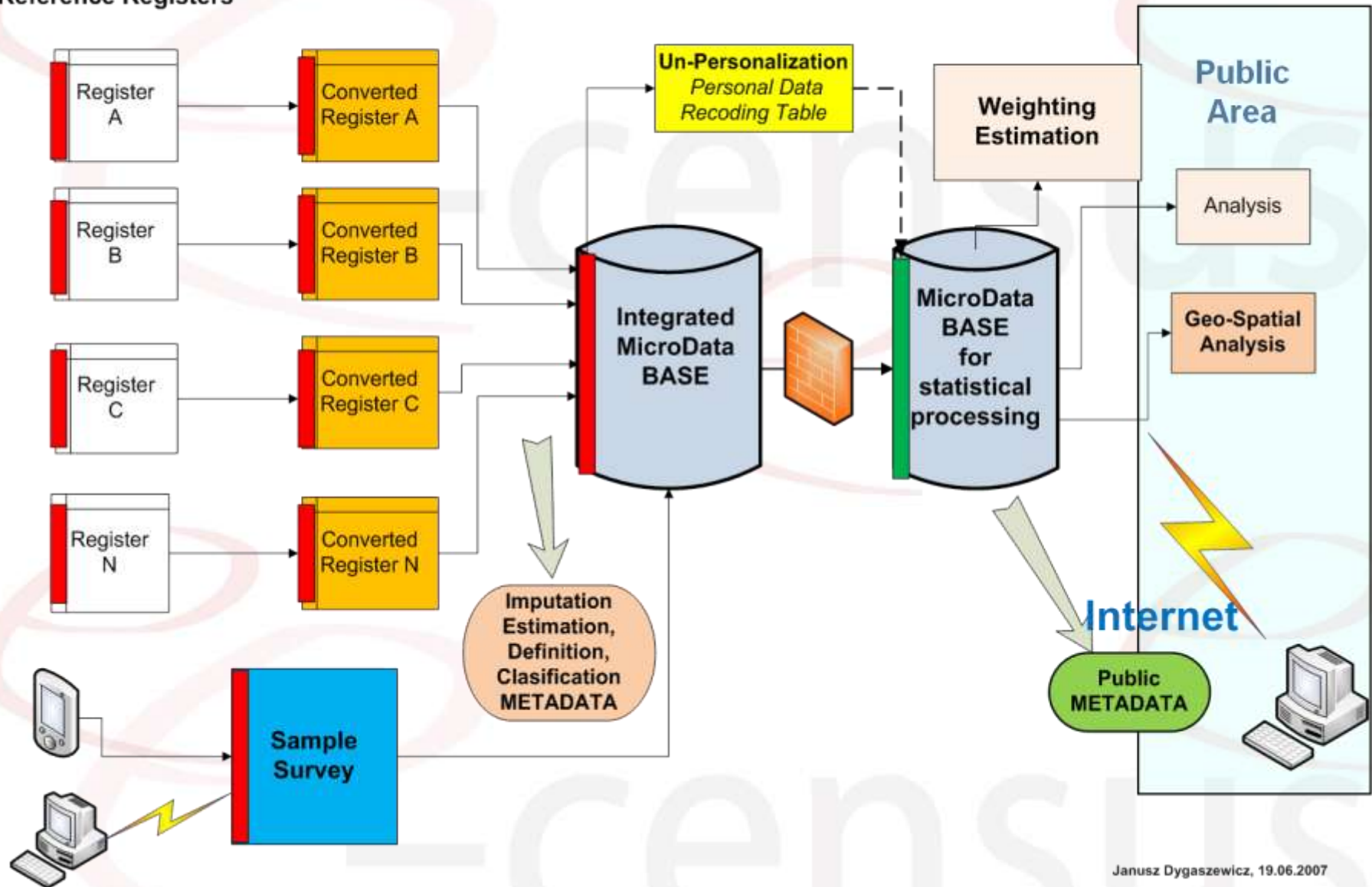
**Administrative Sources
including spatial data
Reference Registers**

**Edition &
Normalization**

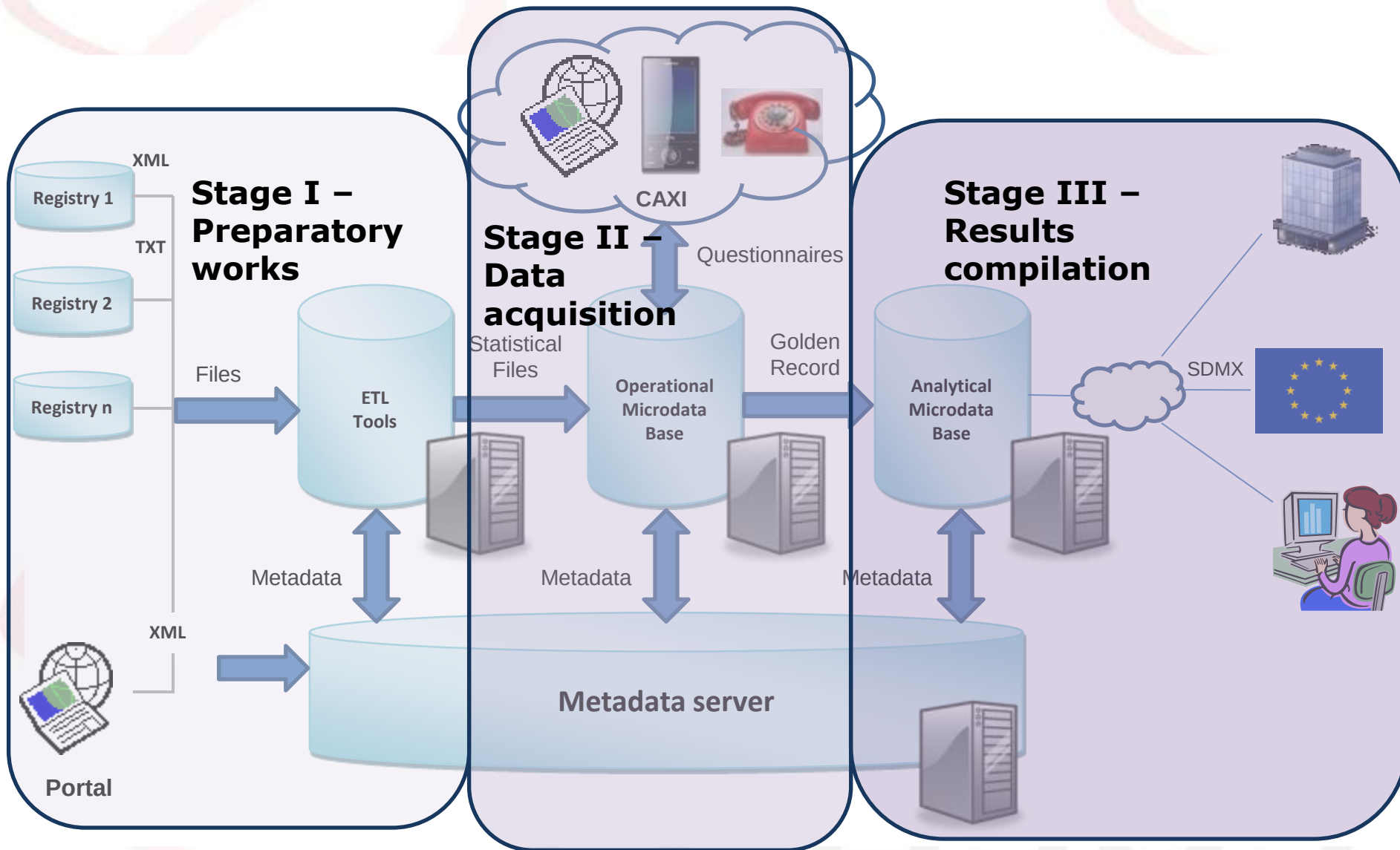
**Data Integration
(Estimation, Calibration)**

Anonymisation

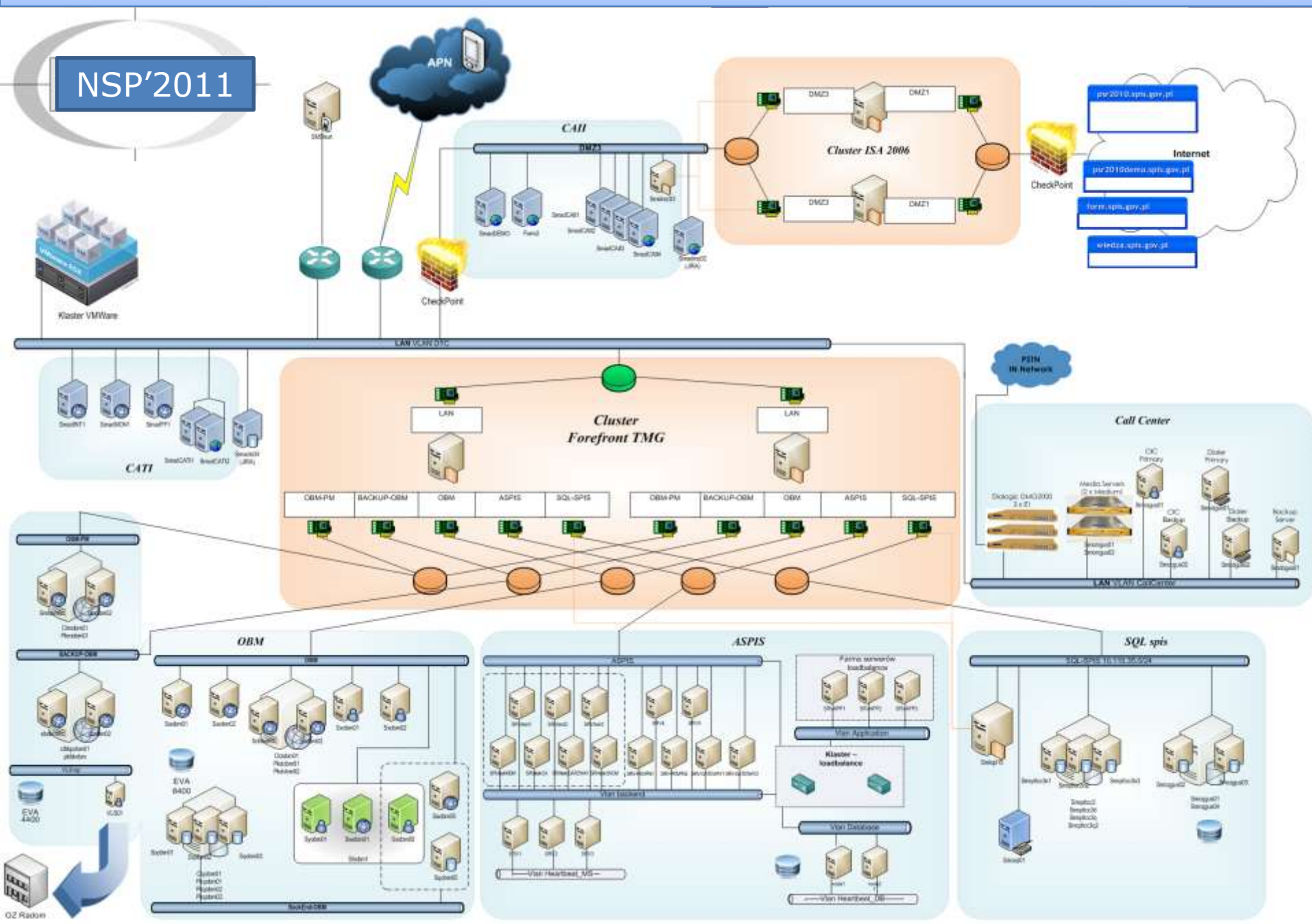
Dissemination



Architecture solution



NSP'2011



ICS – main elements

Stage I – Preparatory Work:

- Metadata System
- Building Register
- Application for updating the statement of houses, flats and people
- Map servers (ESRI)
- Enumerators Registration System
- The notification System and Knowledge Base

ICS - main elements cont.

Stage II – Data acquisition:

- The platform for data acquisition TransGUS
- Operational Microdata Base (OMB)
- Self Enumeration online system
- Metadata System (MS)
- Mobile and dispatch application – ASPIS
- Call Center

ICS - main elements

Stage III – Results compilation:

- Operational Microdata Base (OMB)
- Metadata System (MS)
- Analytical Microdata Base (AMB)
- Geostatistics Portal

Some of these systems were created by more than 10 commercial companies, but development and integration of whole system was conducted by CSO.

Operational Microdata Base

- **The Operational MicroData Base (OMB)** - system included hardware-system-tool infrastructure (computer hardware, system software, tool software) and application software (computer programs that are the result of programming work). This base enabled the inclusion of data transmitted in electronic form through four informational channels by entities and to conduct further data processing. In the OMB processes connected with the control, correction, and linking of data, up to their complete cleansing took place. Next, depersonalized data were transferred to the Analytical Microdata Base (AMB).

Operational Microdata Base

- The basic structure of data in the OMB is a layer. It is a set of records, each of which relates to one census unit (a person, a dwelling, a household). The records include the values of census attributes derived from source data collected from respondents or defined in a different way (e.g. in the process of imputation). Layer can differ between one another with a set of attributes whose values are presented in a given layer.
- In the first step of processing, before beginning the census, on the basis of source sets and the census frame the layer referred to as a Master Record was created, consisting of the initial value of the selected subset of census attributes. The values from this layer were transferred to the CAPI, CATI and CAI processes for personalization electronics questionnaires.

Operational Microdata Base

- After completing the census with the use of the CAPI, CATI and CAI processes, on the basis of information collected in the processes proper layer in the database are created. The layer which have already been saved in the system can serve as the basis for creating new, internal layer in which new attributes (derived from the existing ones) can be added.
- Collection and processing of data was done in the OMB, which contained personalized data on the census unit, together with the value of characteristics obtained from administrative sources and from other channels (CAI, CATI, CAPI)

Operational Microdata Base cont.

- **In OMB have been carried out processes of :**
 - cleaning,
 - integration and verification of data,
 - correcting data,
 - data processing,
 - generating operational reports,
 - depersonalizing data and export of data (as Golden Record) to AMB.



GOLDEN RECORD

Golden Record generation

Integration with Census Frame and CAXI data,

Validation,

Correction,

Operational Imputation,

Transfer proper values to Golden Record,

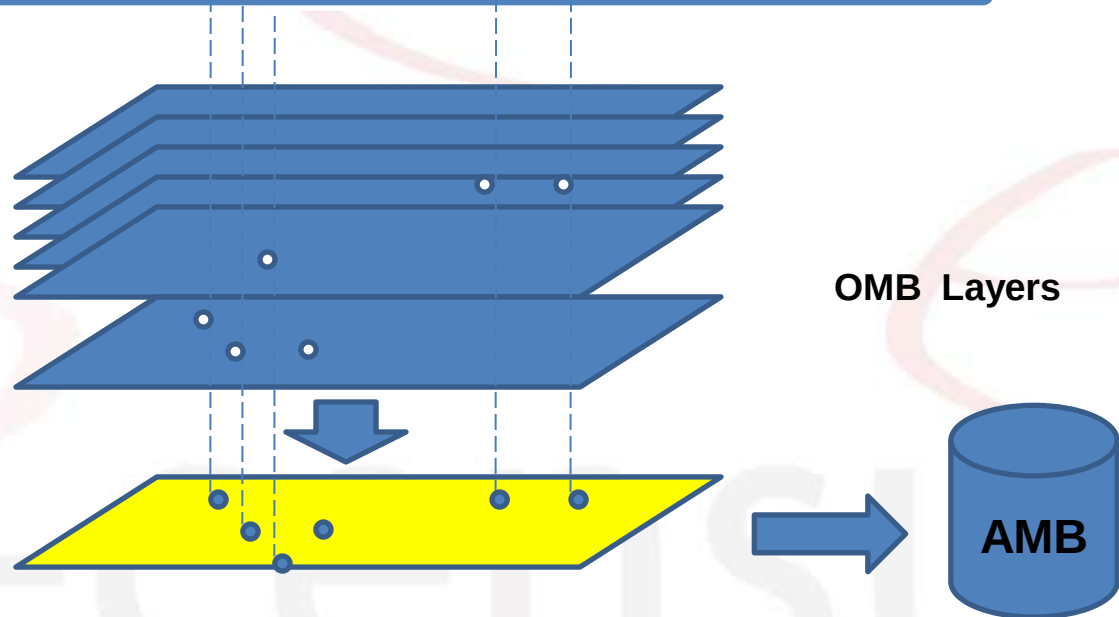
Registers 1..n

CAXI

Golden Record

OMB Layers

AMB



The main objectives of AMB

Preparation and dissemination census data for statistical analysis

Dissemination of analytical and reporting platform for development of census data collected and preparation of statistical products for national and international users.

Supporting for process of creation and dissemination statistical products

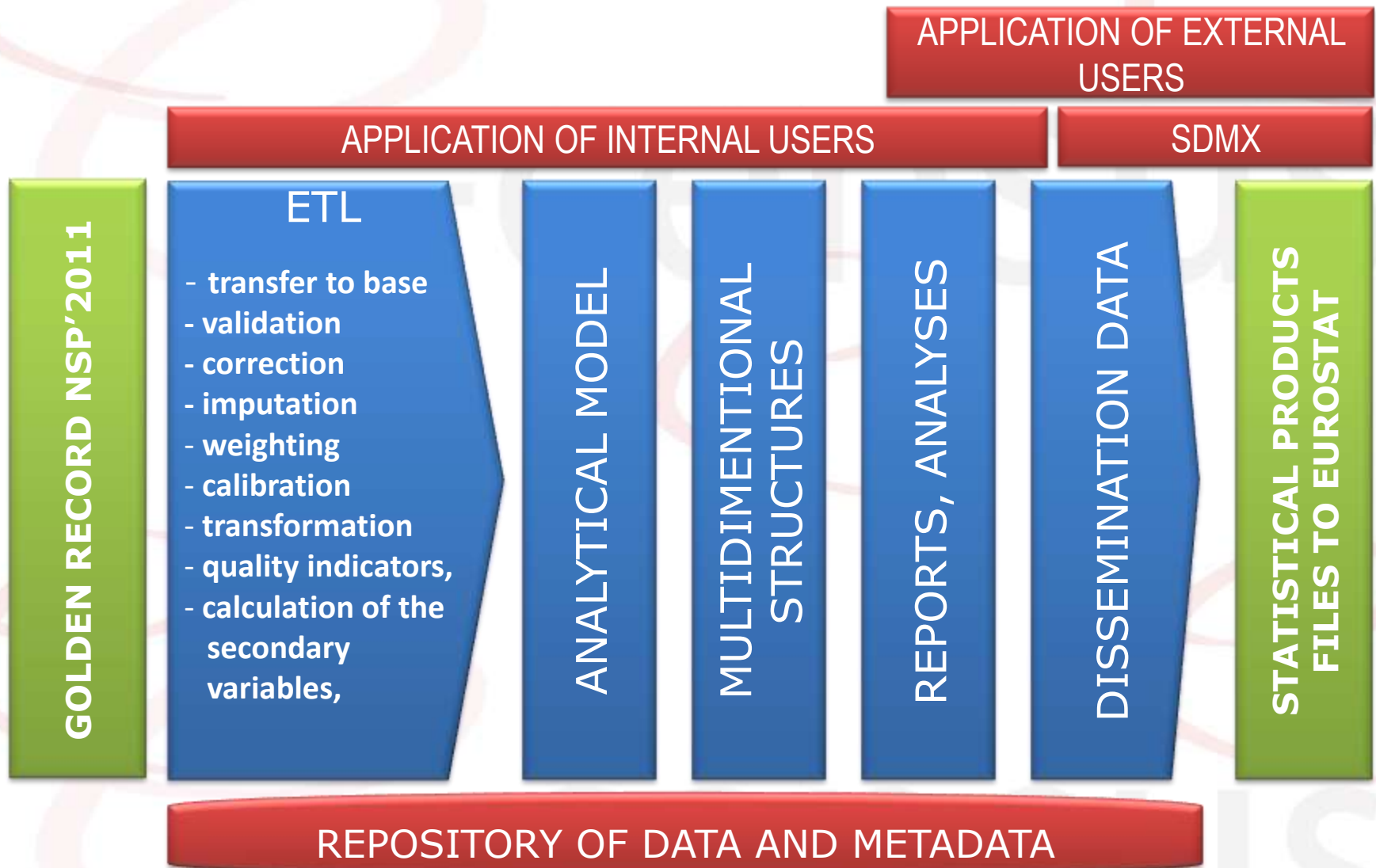
Analytical Microdata Base cont.

In the Analytical Microdata Base took place the following processes: data integration, validation, automatic correction, imputation, calibration, creation a new secondary variables and new statistical units (i.e. families and households).

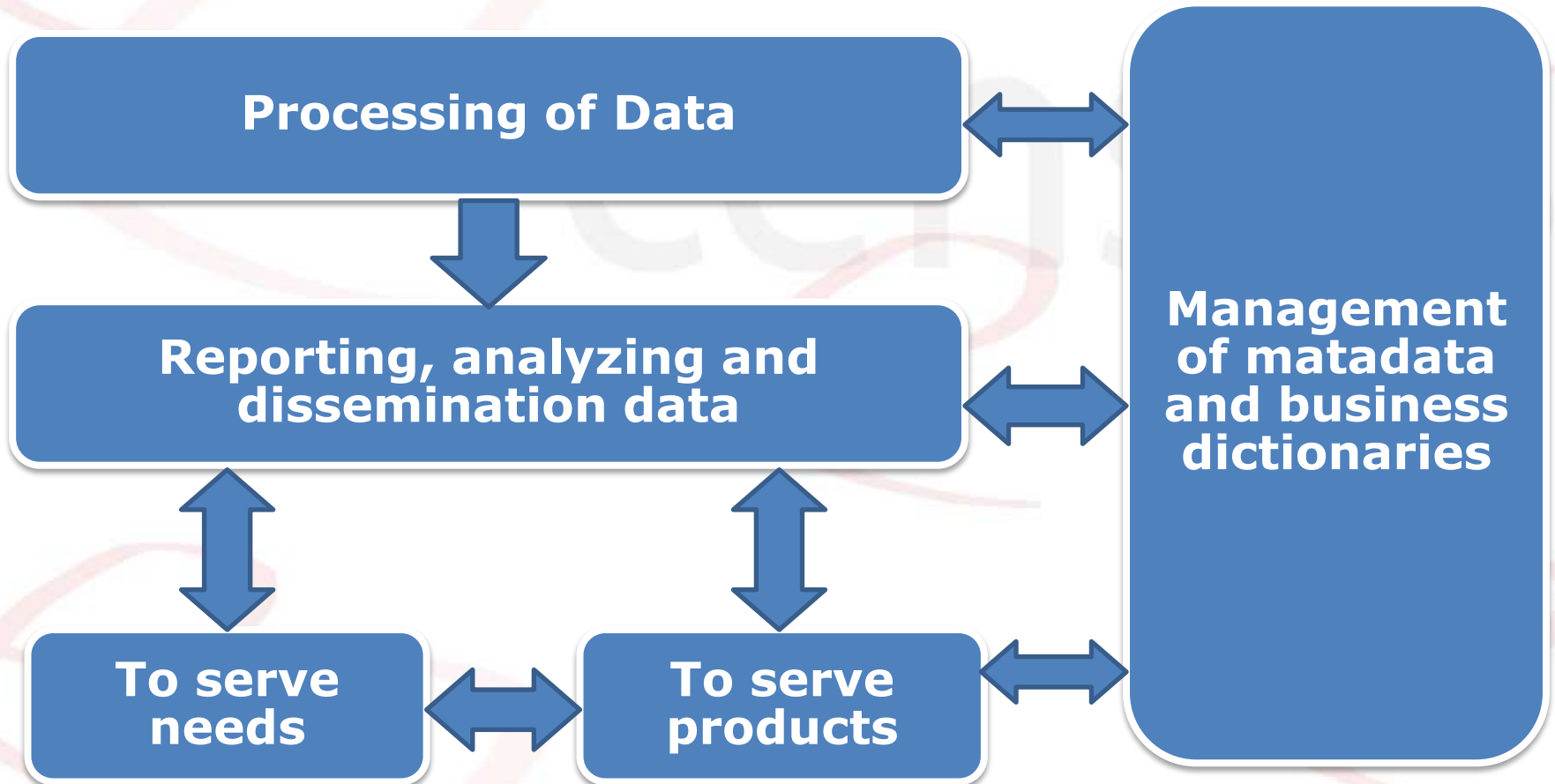
ETL processes in OMB and AMB were repeatedly executed until the approval by the methodologists.

In the next step, processes concerning creation multidimensional objects - OLAP Cubes (domestic needs), and Hypercube (60 HC) and Quality Hypercube (in accordance with international requirements - Eurostat) were made.

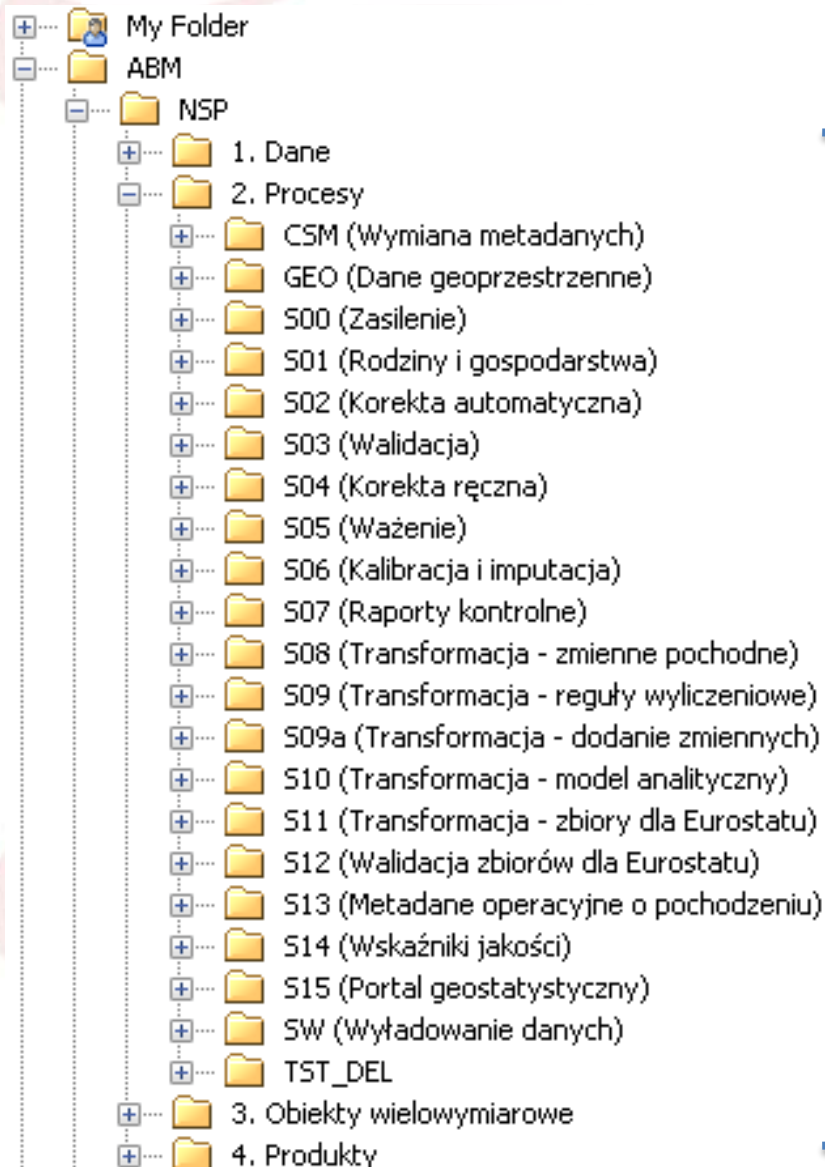
Concept solution



The main processes of AMB



ETL proccess



The processing of data in the system AMB is divided into stages showing the logic of data processing.

Each stage contains one or more enumerated processes (so-called job-s), realizing the elementary tasks.

This picture presents the directory structure of ETL processes.

Data processing in AMB

In order to realize the process of "Data Processing", a series of ETL jobs were divided into the following steps (using the SAS Data Integration Studio tools):

- S00: load source data from Golden Record NSP'2011 (8 tables: Buildings, Dwellings, Collective living quarters, Persons, Emigrants after 2002, Homeless, Households, Families),
- S01: copy the relevant objects, Households, Families ,
- S02: execution of the automatic data correction,
- S03: Validation tables of Golden Record,
- S04: execution of manual data correction,
- S05: weighing data
- S06: data calibration and imputation

Data processing in AMB

- S07: control reports
- S08: calculation of derived variables
- S09: calculating rules on the basis of dictionaries
- S09a: adding the secondary variables
- S10: transformation data to the analytical model (facts tables and dimension tables, cubs for national purposes)
- S11: creation and loading hypercubes for Eurostat
- S12: validation of hypercubes and creation quality hypercubes for Eurostat
- S13: transformation of operational metadata
- S14: enumeration of quality indicators
- S15: preparation aggregates for the Geostatistics Portal

Census Hub

Select dataset

Specify dimensions

Select layout

View data

Download

CENSUS HUB - HC01

Date of Extraction : 13.12.2013 09:12:02

Web Service name	HC Note	Answer ratio	Query time	Response received
Poland			342 ms	13.12.2013 09:12:02

Census Data

Age

Total

Current activity status

Total

Country of citizenship

Total

Household status

Total

Country/place of birth

Total

Sex

Total

Time period or range

Year 2011

Geographical area	Legal marital status	Registered partnership legally dissolved (and not married or in a new registered partnership)	Divorced (and not remarried or in a registered partnership)	Registered partnership ended with the death of partner (and not married or in a new registered partnership)	Married	In a registered partnership	Never married and never in a registered partnership	Total	Not stated	Widowed (and not remarried or in a registered partnership)
Poland		0	1600480	0	18184339	0	14986152	38044565	141694	3131900
Region Centralny		0	382437	0	3670898	0	2985925	7766960	34468	693233
Region Południowy		0	294469	0	3874457	0	3051675	7875493	13811	641081
Region Wschodni		0	204239	0	3235589	0	2657383	6676790	18207	561372
Region Północno-Zachodni		0	266011	0	2888885	0	2470881	6130008	32122	472109
Region Południowo-Zachodni		0	203843	0	1801092	0	1501513	3848042	15381	326212
Region Północny		0	249481	0	2713419	0	2318775	5747272	27705	437893
Extra-Regio Nuts 1		0	0	0	0	0	0	0	0	0

The Metainformation System

The Metainformation System gathered indispensable metainformation describing data and census processes, including the processes indispensable to drawing up quality reports. The task of the Metainformation System was to ensure the coherent definition of statistical objects for the Operational Microdata Base (OMB) and Analytical Microdata Base (AMB).

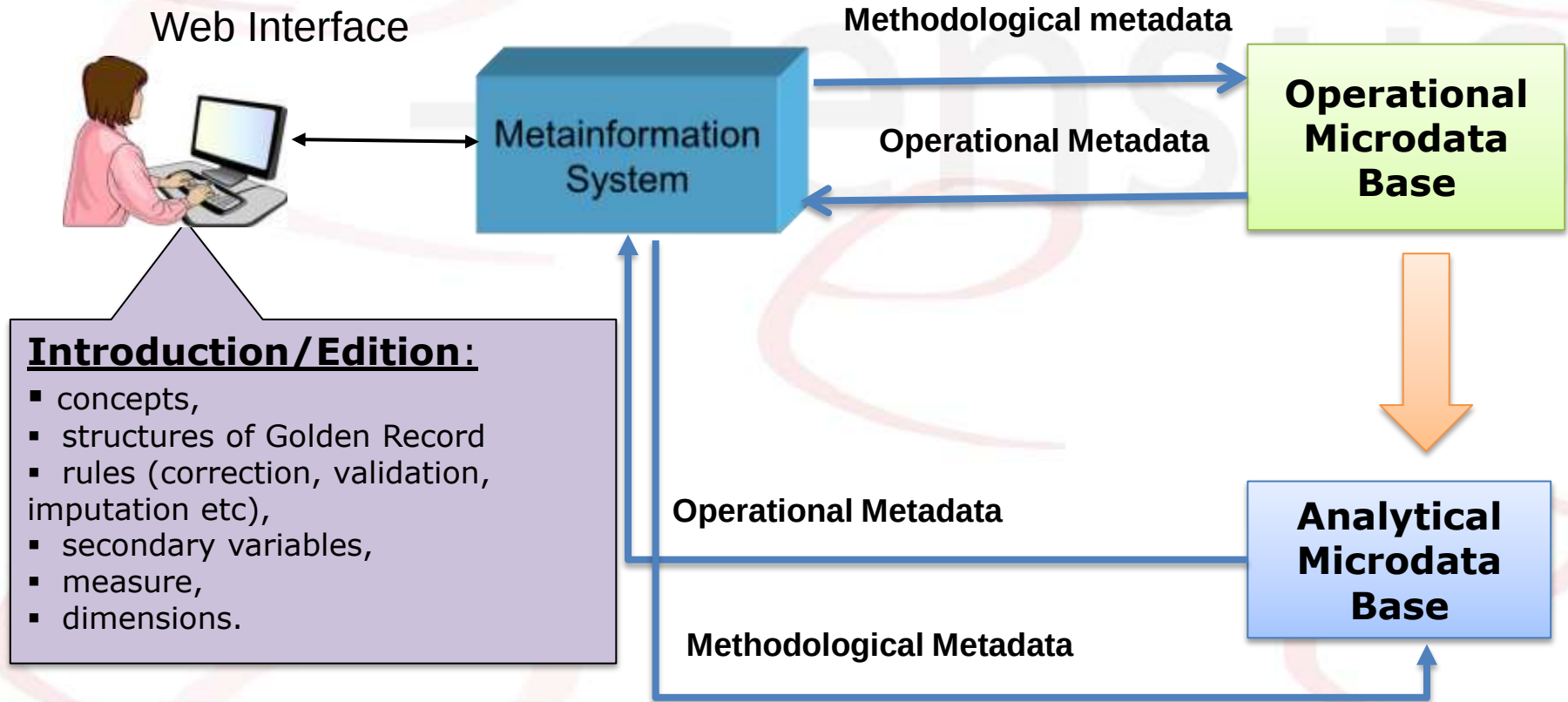
Conceptual model of metadata

- Methodological metadata
 - Describe the data and processes in the context of existing inventories
 - Are the basis for the implementation of technical objects executive systems (eg. OMB, AMB)
 - Examples: concepts, rules, processes definition, dimension, measures definition, quality indicators definition

Conceptual model of metadata

- Operational metadata
 - Are collected in executive systems
 - Are collected for the purpose of reporting
 - Describe the data processing
 - Examples: information about the collection of data, information on the source of the features, the values of quality indicators
- Technical metadata
 - Implementation of methodological metadata in specific technical environments, for example, SAS

MetaInformation System



Census data dissemination



**GEOSTATISTICS
PORTAL**



**GEOSTATISTICS
PORTAL**

GEO.STAT.GOV.PL

START: JULY 2013

Census results: *Choropleth maps, Diagram maps*

Local Data Bank

Other statistical databases

Geostatistics Portal

The main objectives of the Portal

- The spatial presentation of collected data, in particular:
 - **Agricultural Census 2010**
 - **Population and Housing Census 2011**
 - **Local Data Bank** – a huge database with statistical data for years 2009-2012
- The spatial presentation of the geostatistical analysis results
- Completing tasks associated with **INSPIRE** Directive guidelines implementation

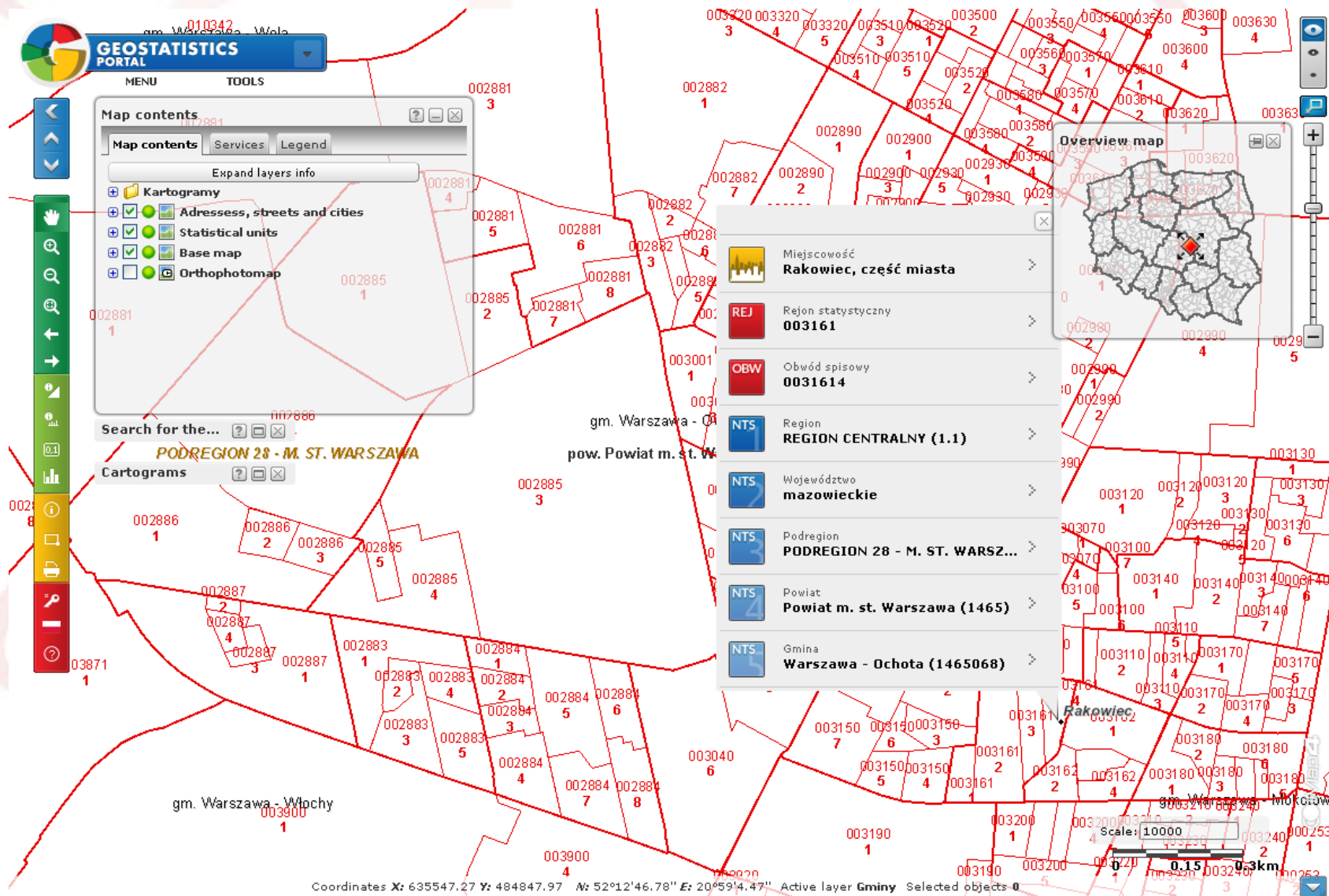
Geostatistics Portal

The portal allows statistical data presentation in form of any spatial unit:

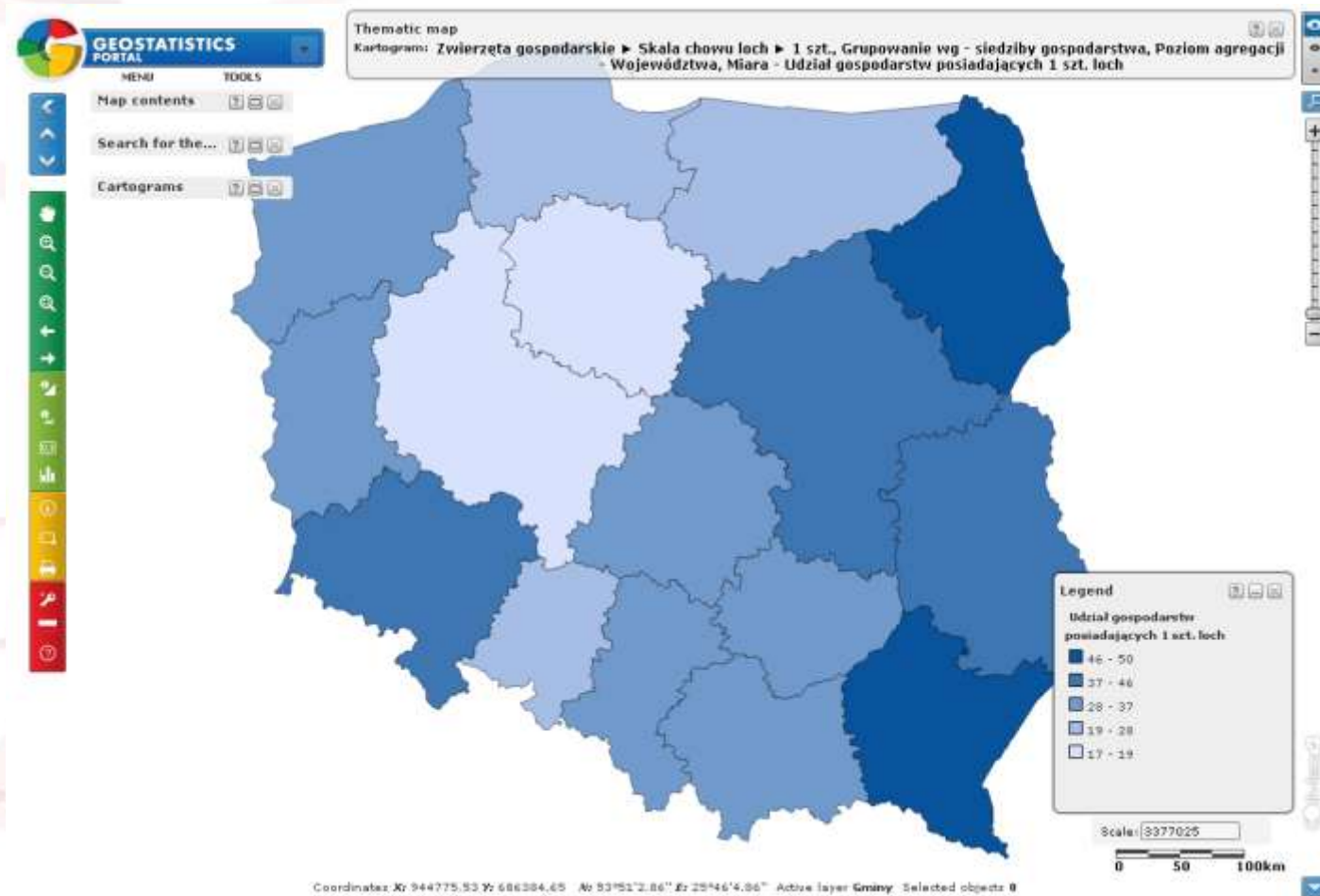
- **5' grid**
- **1 km² grid**
- **administrative division**
- **urban division**
- **statistical division**
- **any other polygon**

Default view



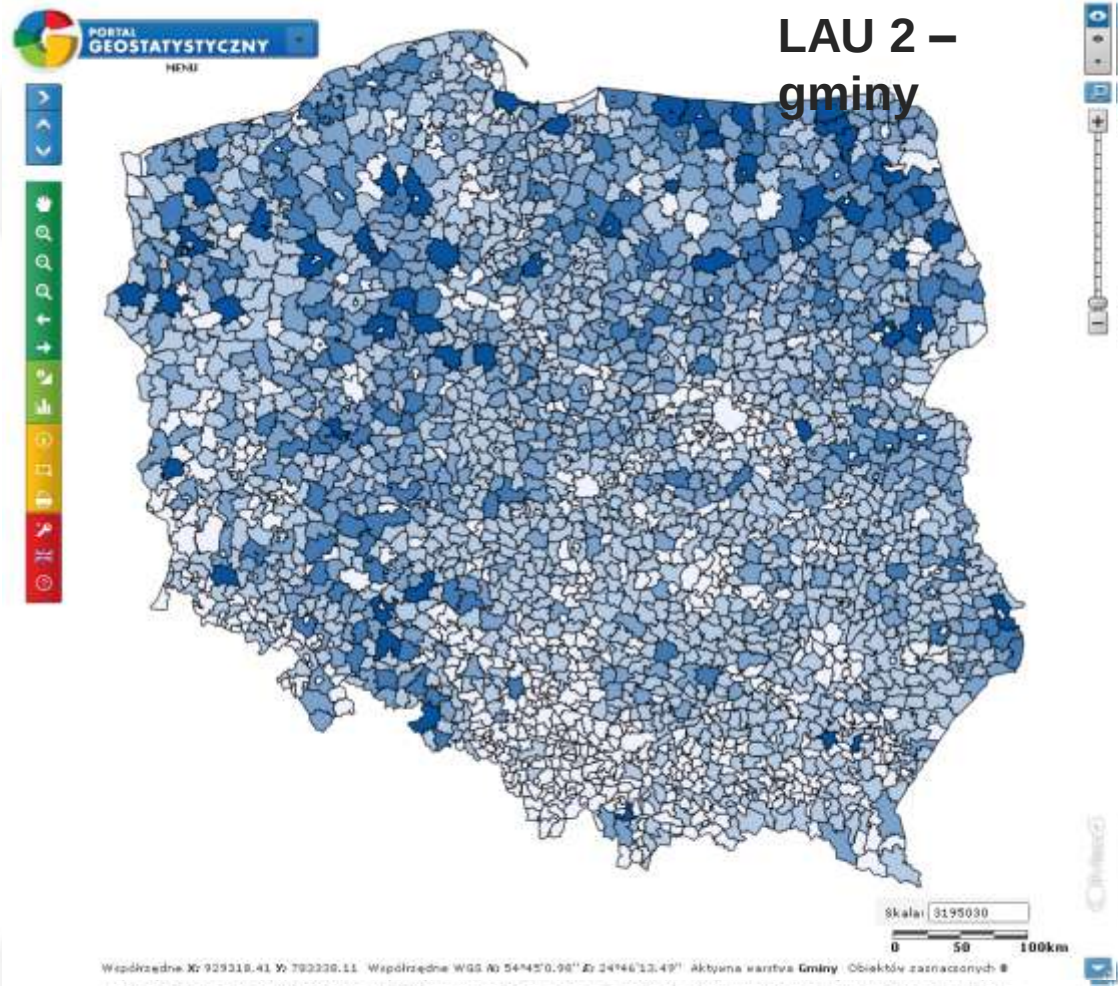


Choropleth map



One phenomenon

- various presentation levels



Individual data - dynamic inquiries the possibility of obtaining data from the indicated area

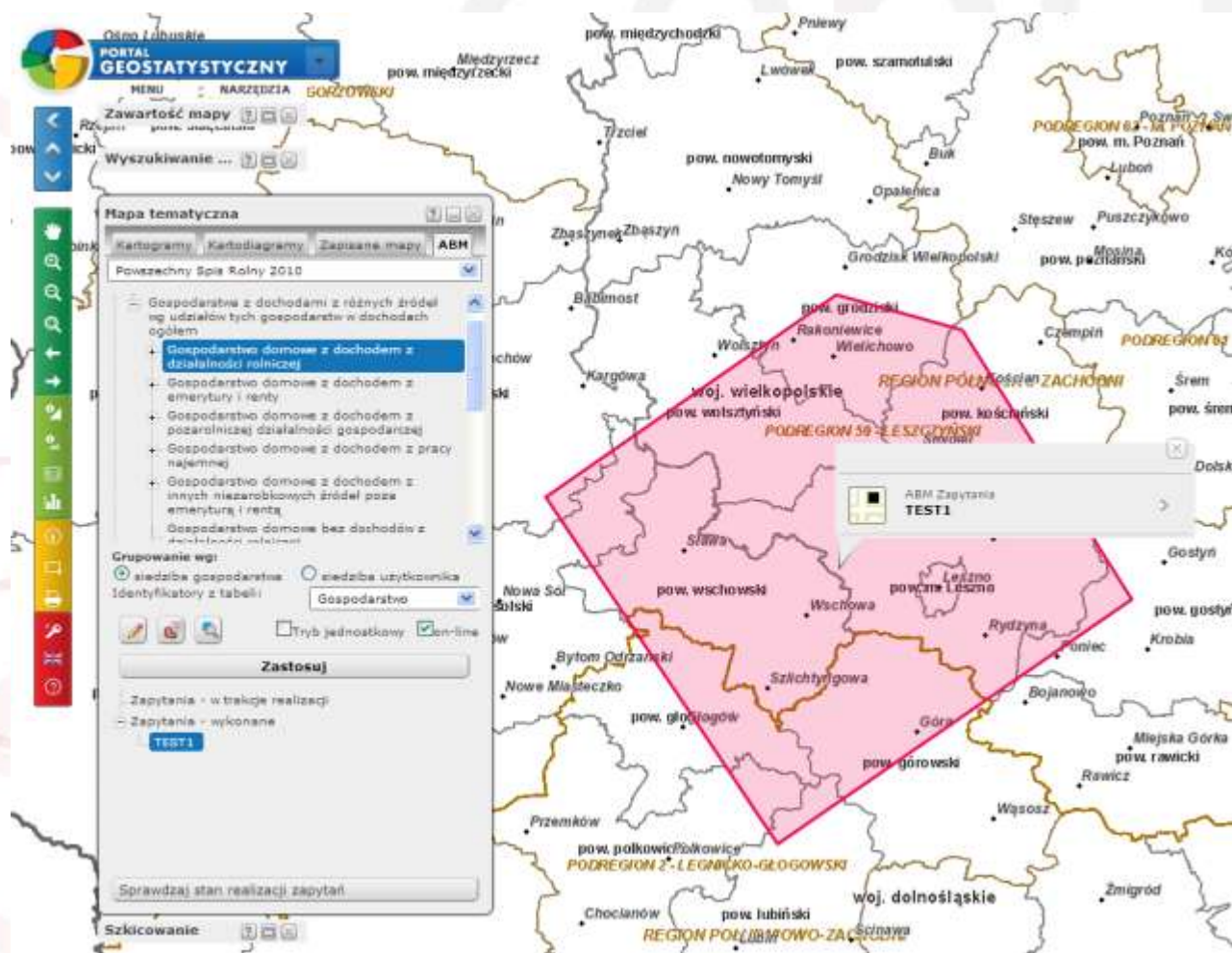
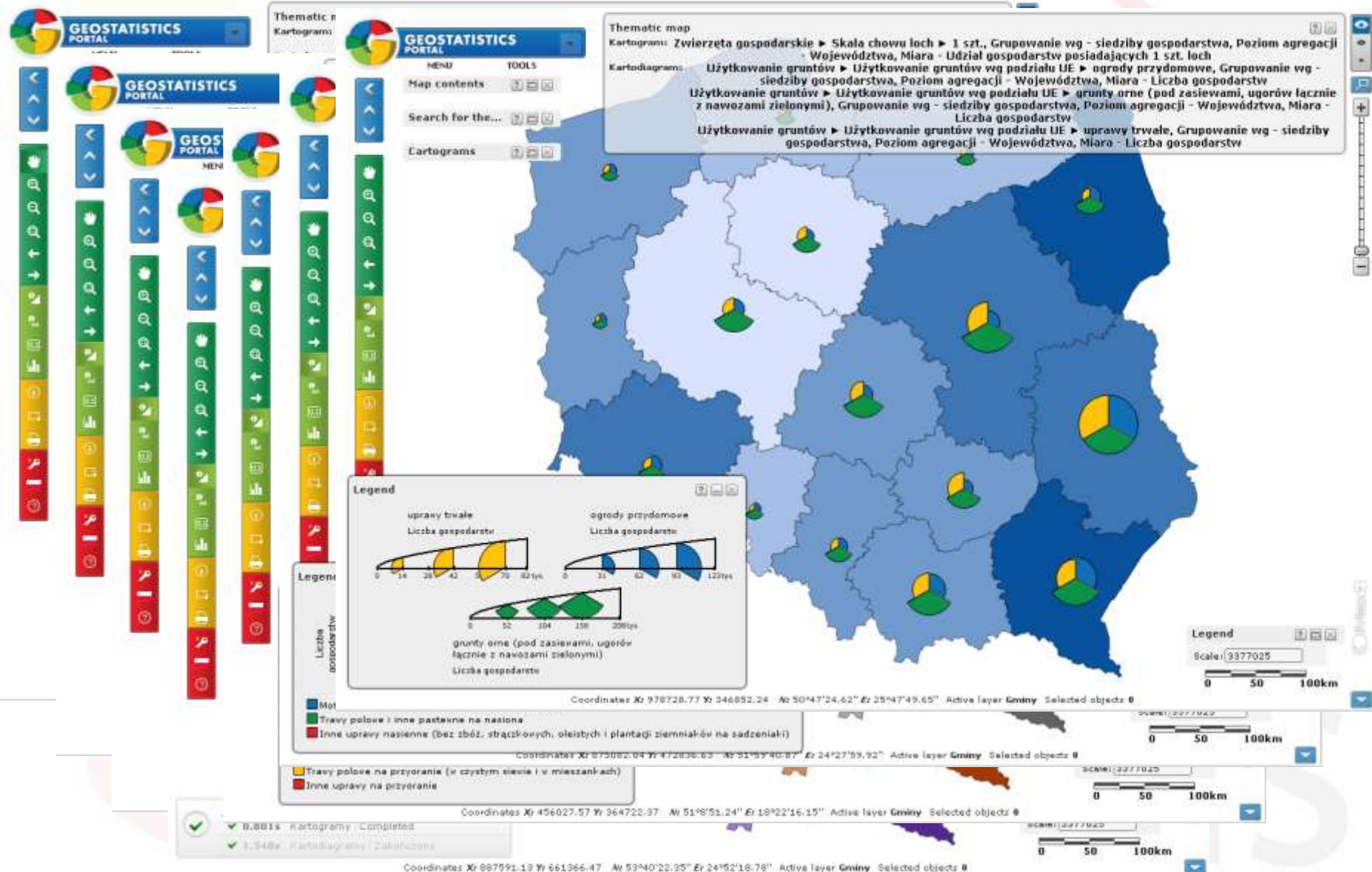
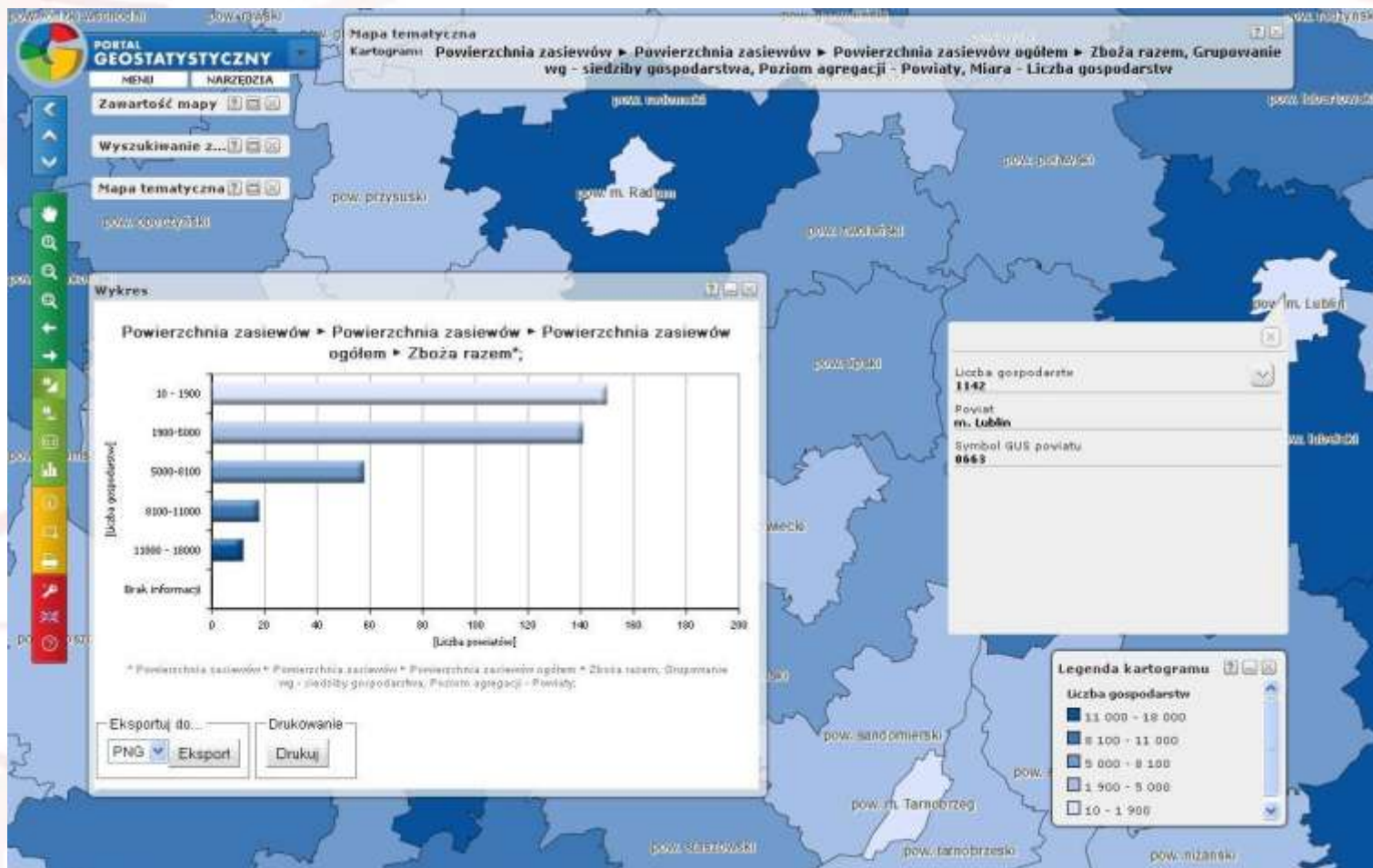


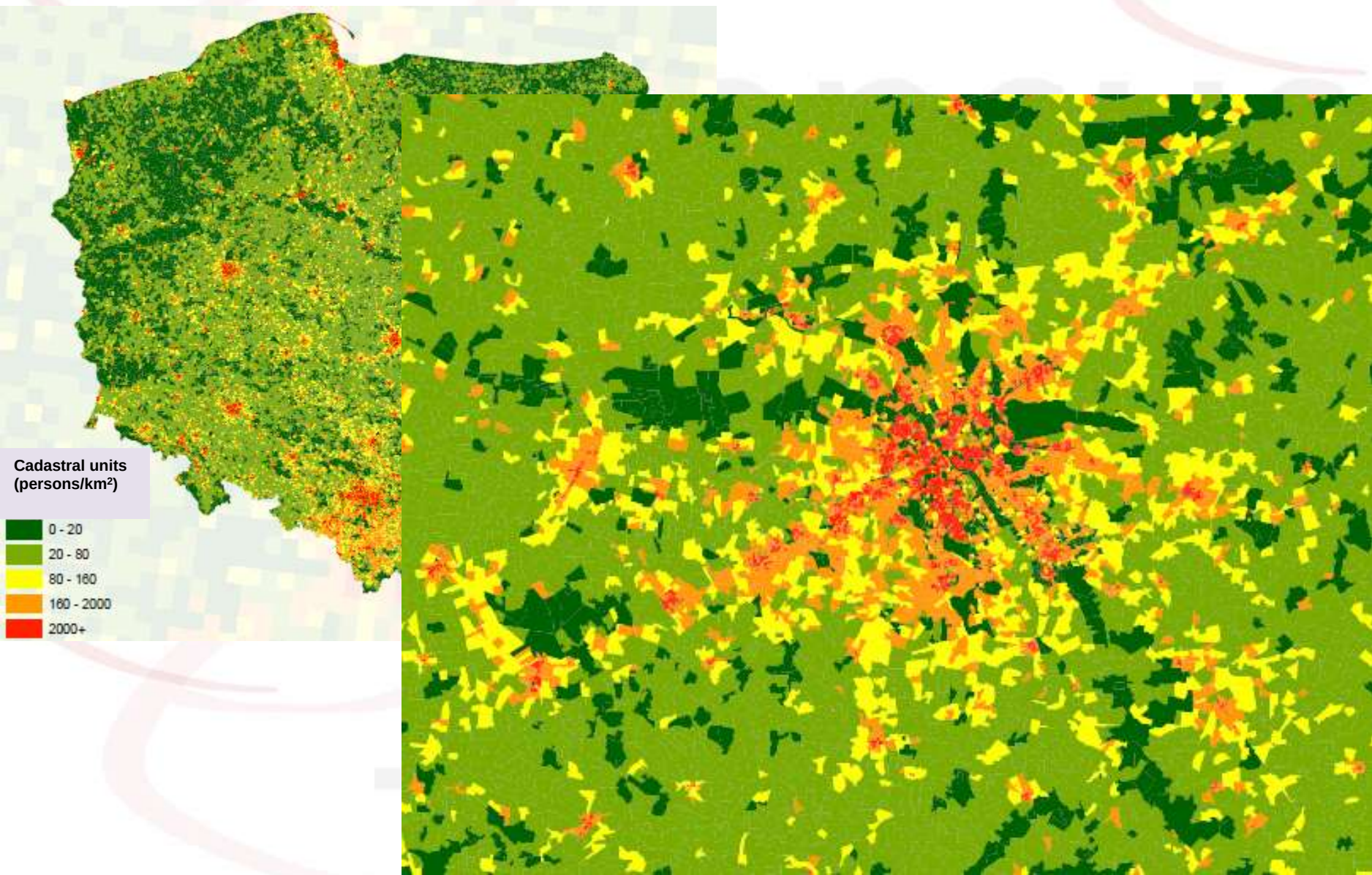
Diagram maps



Bar chart



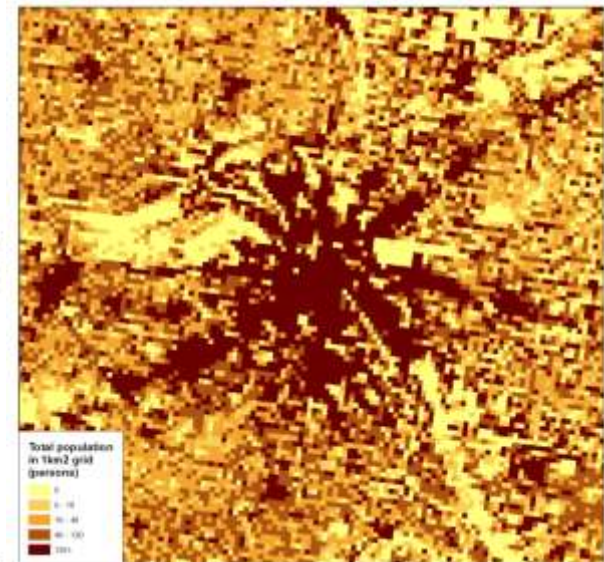
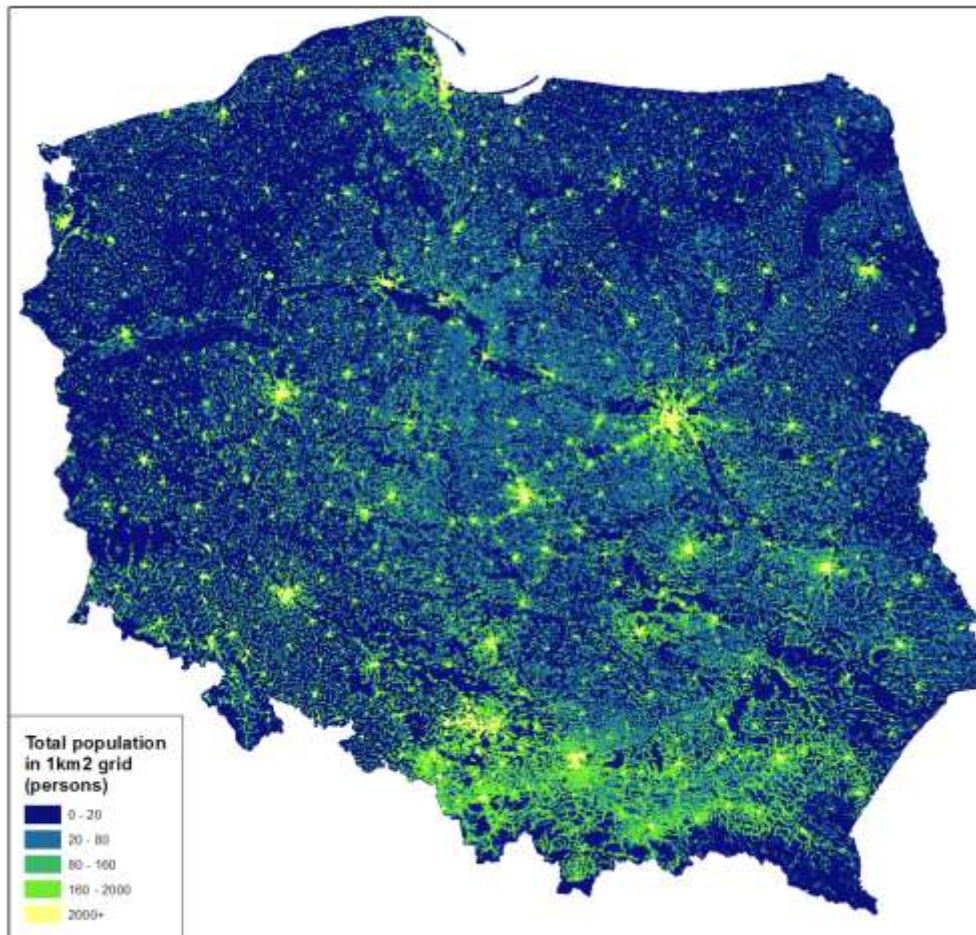
DEMOGRAPHIC DATA IN CADASTRAL UNITS



Publishing statistical data on grids

GEOSTAT project

Merging statistical data and geospatial information





Geostatistics Portal – benefits

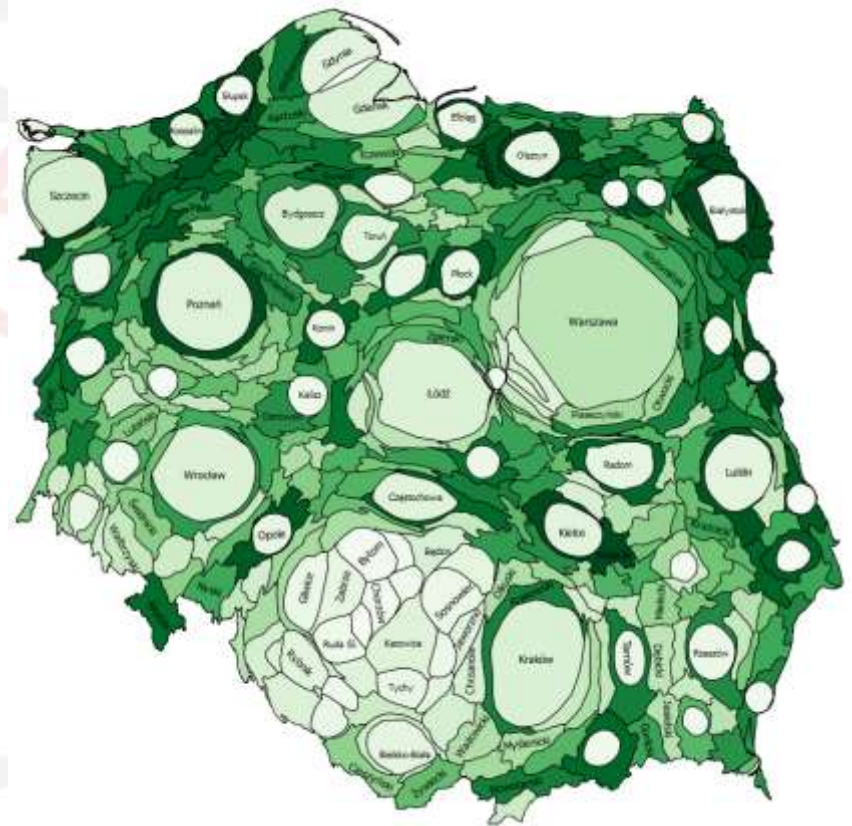
- easy access to a huge amount of data on agriculture and demography (**statistical data merged with geospatial data**)
- a variety of cartography presentation methods
- spatial analysis tools
- INSPIRE compliant network services
- in the future:
 - geovisualization platform for data from other statistical sources



NEW POSSIBILITIES

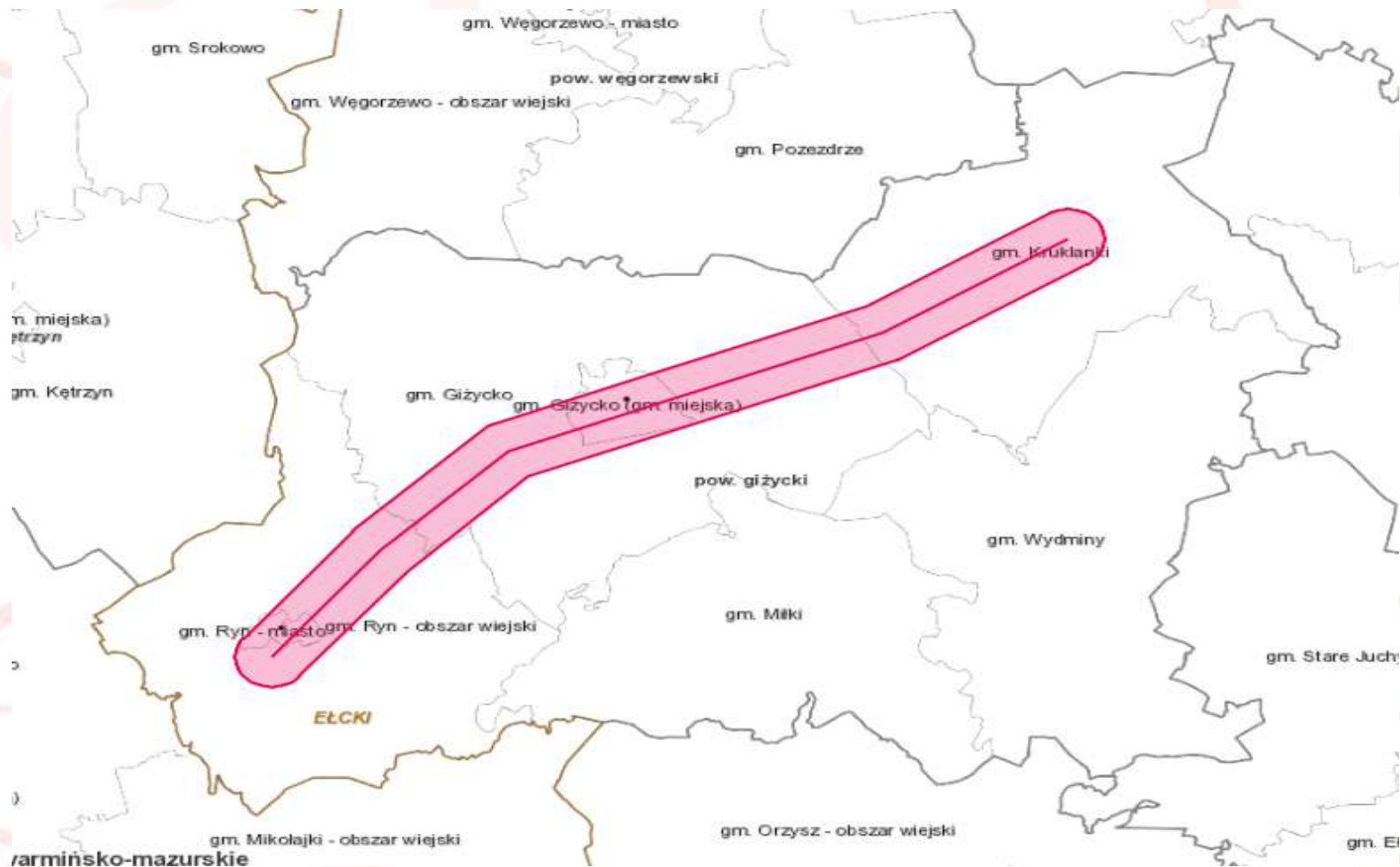
New methods of cartographic presentation

cartograms



Spatial analysis

Linear analysis



Polygon analysis



-census

-census

Flood

-census

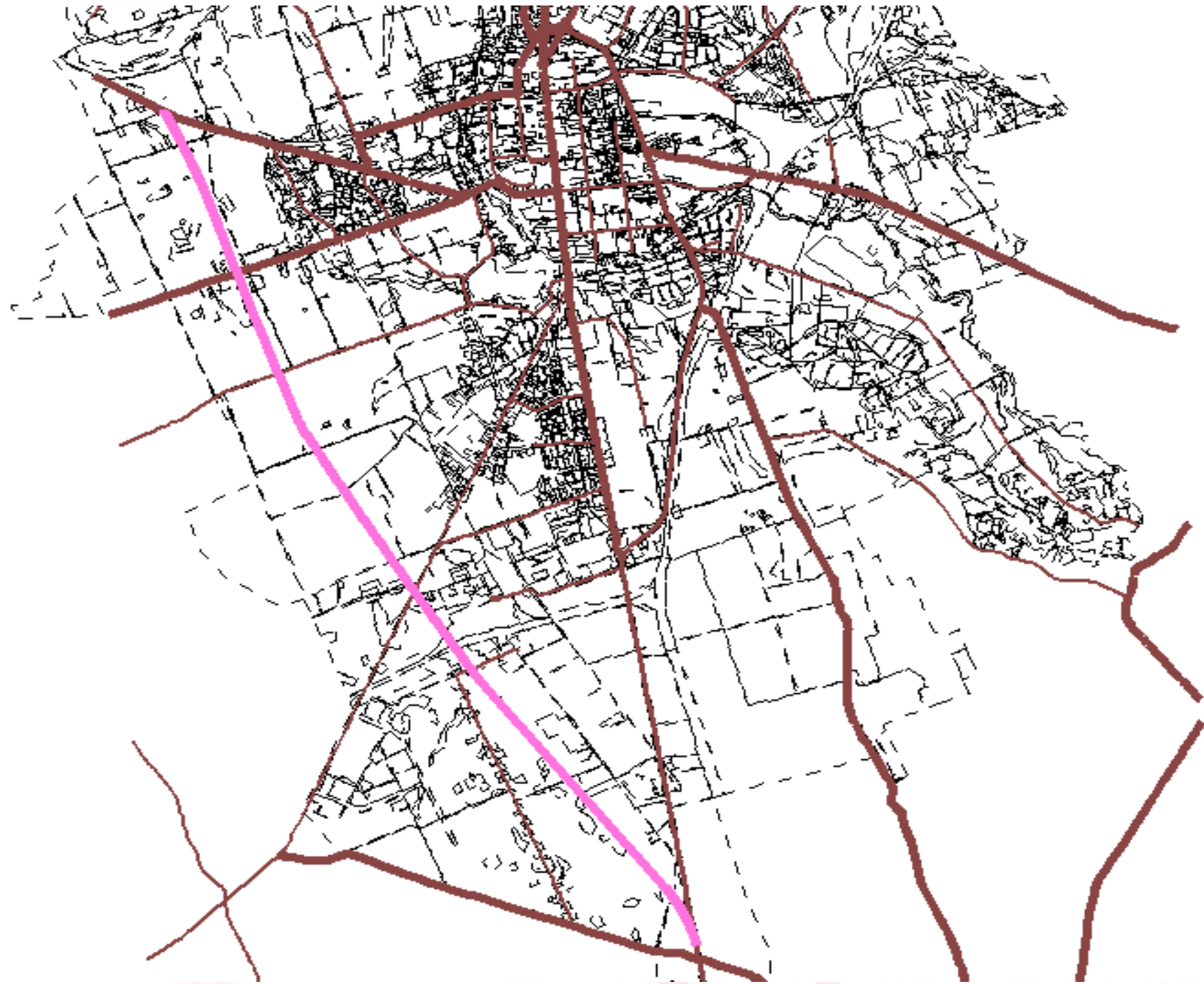




–census

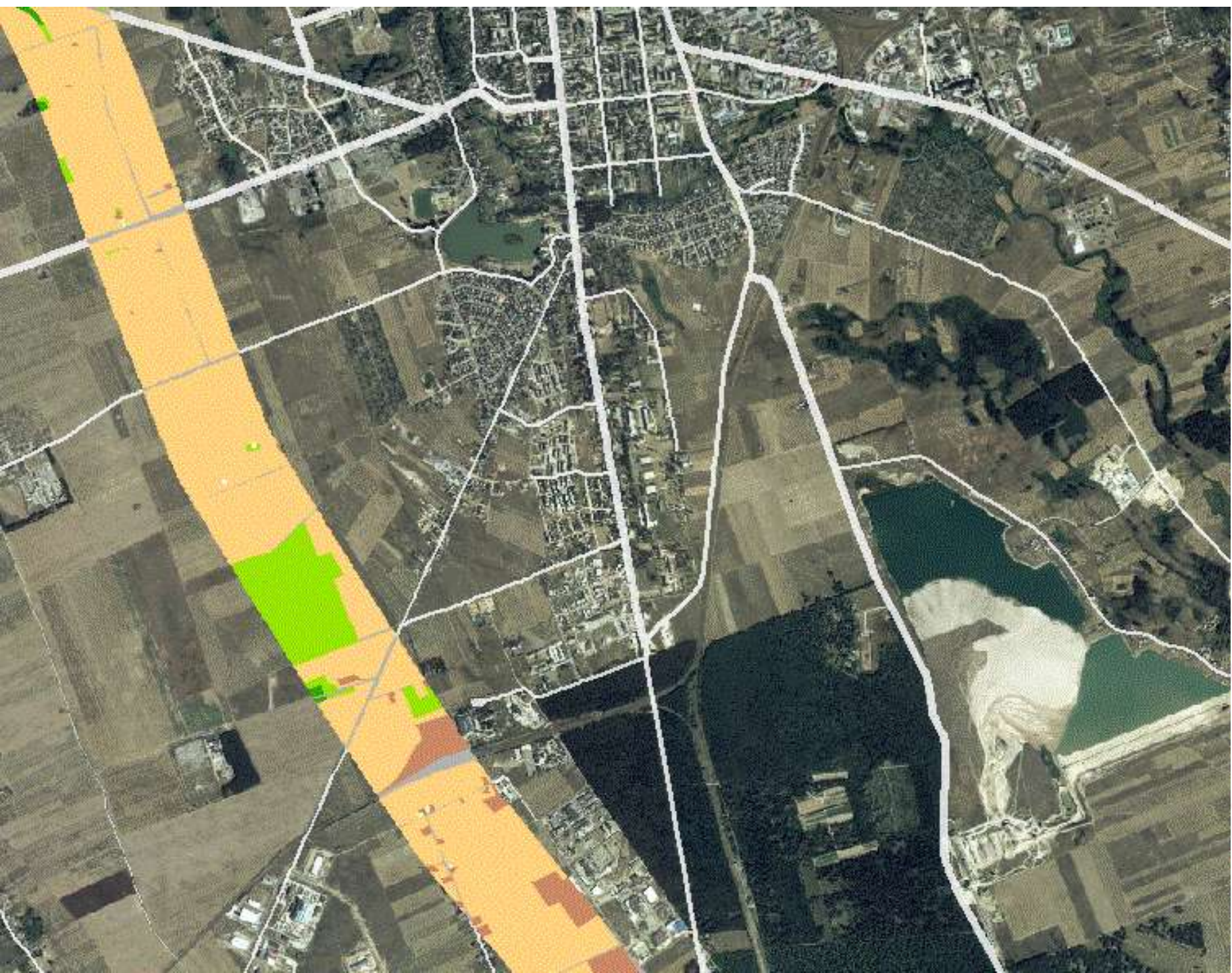
Planning road

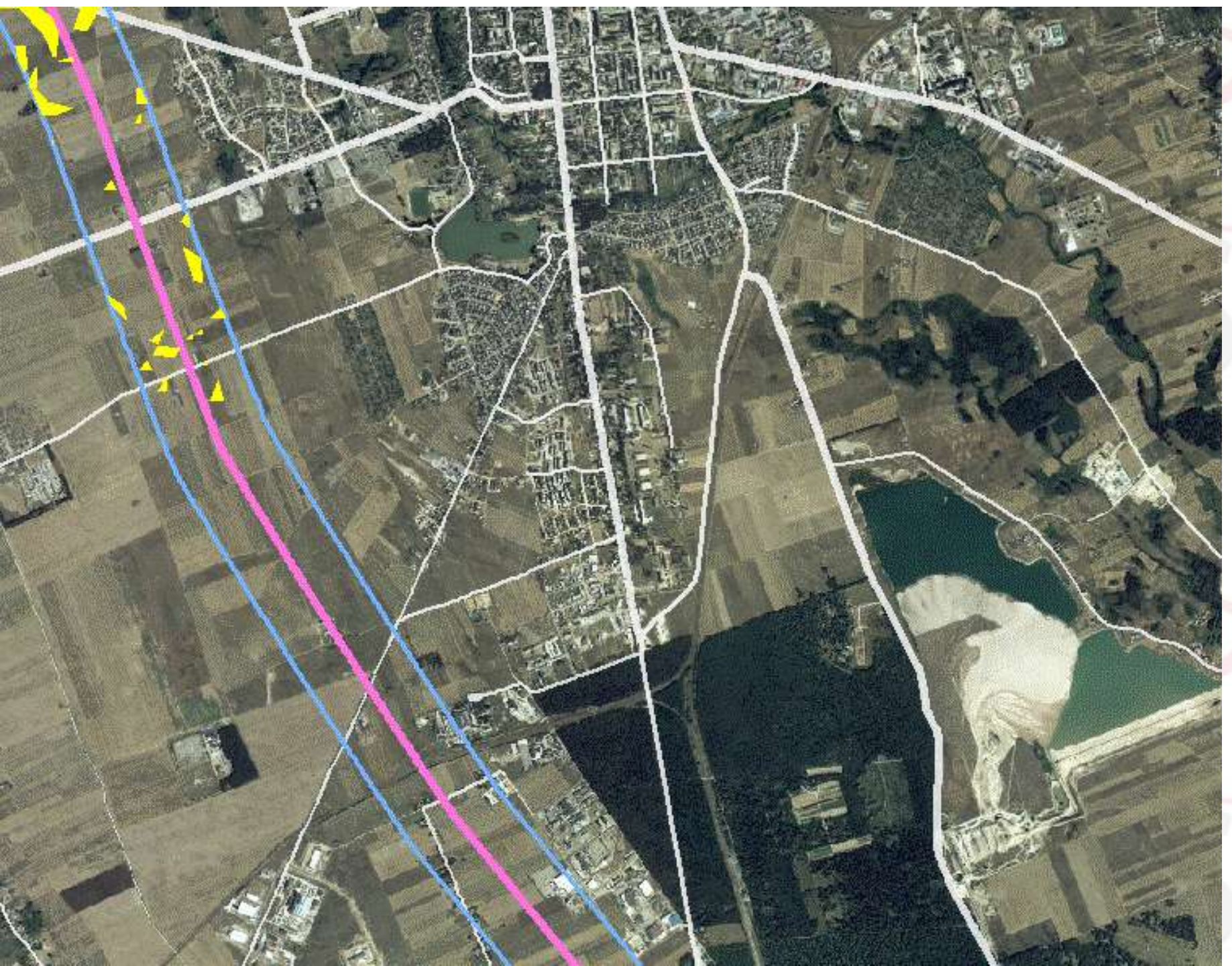
–census













Instead of summary

Census in 2002



170 thousands of
census enumerators



100 mln
questionnaires



1 000 ton of paper



Destruction of the
questionnaires at the
end

Censuses in 2010-2011



18 thousands of census
enumerators

0 questionnaires
0 of paper



Decreased cost:

Nominal cost ca. 35 mln USD

Total about 50 mln USD

(taking into account inflation)

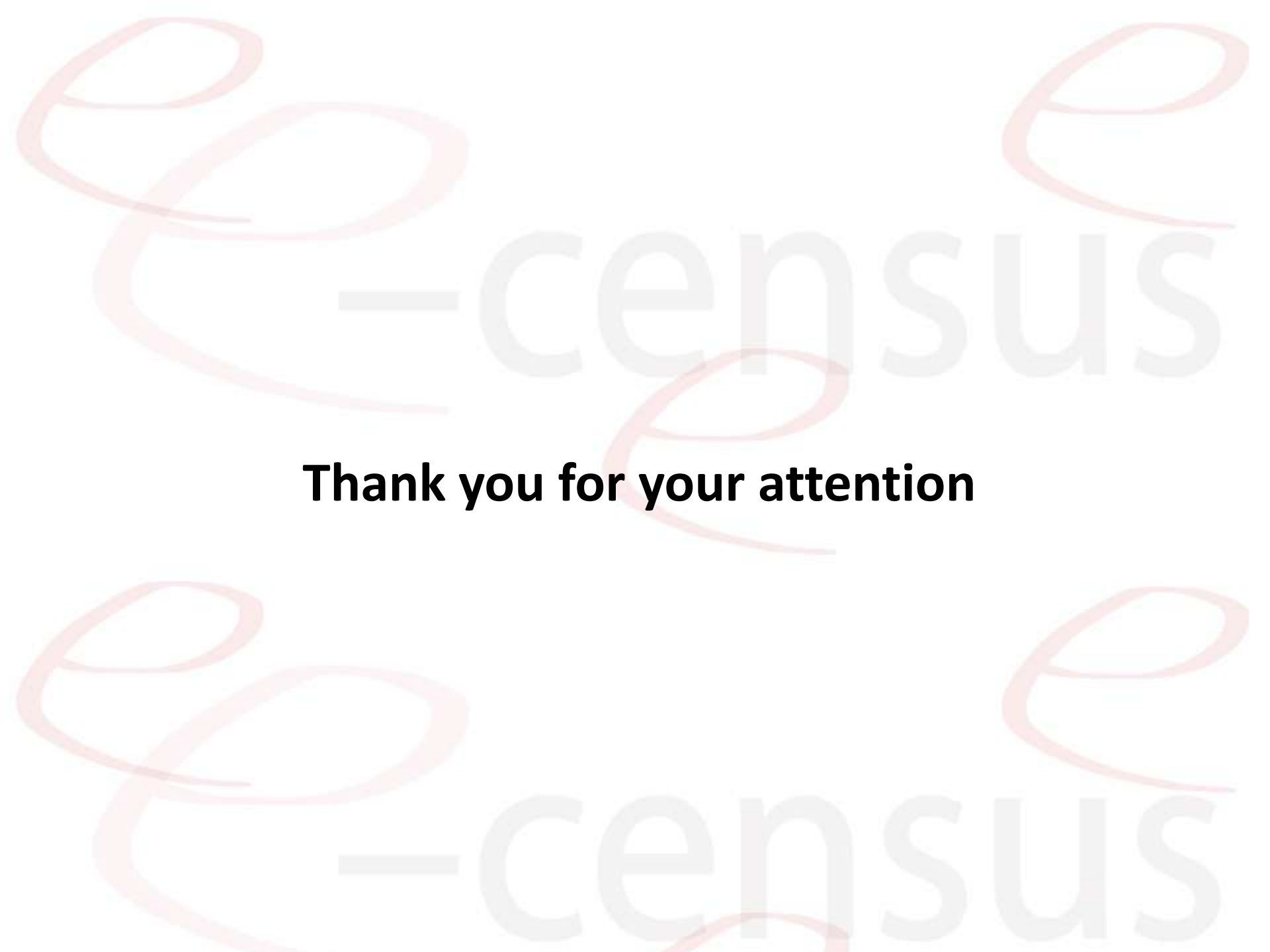


Better data

Data available more quickly

More reliable results

Statistical researches in the
future



e-census

Thank you for your attention

e-census