Providing data from the Real Estate Cadastre (REC)

What is the correcting mechanism of incorrect data in REC like?

Paolo Daniele Viviani
Introduction: The Italian legislative framework
The Italian legislative framework

To properly address the open data topic according to the current Italian legislative framework, it is a mandatory overview of three related topics:

- Data protection;
- Public sector data interoperability
- Open data
Article 9 of decree-law no. 179/2012 defines a legislative framework that enhances access to and reuse of Public Sector Information (PSI) by introducing a clear definition of “open data” and a general principle of openness, by default. **Agency to Digitalize Italy [AgID]** is identified as the Italian PSI enabler. In this context, AgID publishes three key documents annually about PSI:

- an Agenda including the national policies and strategies
- a set of Guidelines to support the public administration in the implementation of the strategies included in the Agenda
- a Report assessing the status of development of PSI in Italy with respect to the strategies defined in the Agenda
In the Italian regulatory scenario **interoperability** plays a crucial role for both Public Administration (PA) and the ICT market. It is a pillar concept of the legal interoperability framework called: **Digital Administration Code (CAD)**

The legal framework is enforced by the Italian ICT interoperability framework SPC - *Sistema Pubblico di Connettività e Cooperazione* (Public System of Connectivity and Cooperation)

It consists of two principal building blocks:

**the application services** and the **national interoperability infrastructures**

The national interoperability infrastructures include **the catalogue of ontologies and metadata** as well as a number of **base registers** (e.g., Public Administration Registry, National Catalogue of Geographical Metadata)
The Italian interoperability framework

Italian Digital Administration Code (C.A.D.)

Technological Regulations for C.A.D. enforcement

Connectivity and Cooperation Public System (SPC)

- Access to admin.'s services
- Electronic documents exchange
- Digital signature
- Software reuse
- Public data base integration

- Common specifications for development, security, interoperability and quality of P.A.'s services and infrastructural services

- Nationwide infrastructure
- Public administration’s network made by multi-providers
- Infrastructural services for interoperability
Right to privacy

• The rights of personal status include
  – Privacy or the *right to be left alone*, personal identity, personal data protection

• Right to privacy:
  1. protects intimate, private and family life from interference from others
  2. differs from protection of honor, dignity, reputation and image
  3. must balance with the right of community information (when leading public interest)
Information and Personal Data

Information = economic and strategic relevance
Information includes personal data
Relevance of personal data processing
Need for a high level of protection for:
  – fundamental rights and freedoms, as well as for dignity, particularly with regard to confidentiality, personal identity;
  – right to personal data protection
Data types of the Public Administration

Public Data

Available Data

Open Data

Accessible Data

Free of charge Data or with marginal cost Data
Open data: what are they?

• The evaluation is based on five main criteria:
  – “principles”,
  – “governance”,
  – “conceptual model”,
  – “interoperability agreements”
  – “interoperability levels”.
SPC as a stack of services
• Purpose
  ✓ Guide decisions
  ✓ Support economic growth
  ✓ Encourage Transparency
• It includes
  ✓ Open Data principles
  ✓ Objectives and key datasets
  ✓ Annual action plan

• Purpose
  ✓ Monitor the implementation of the strategy
• It includes
  ✓ Measurement of achievements
  ✓ Indicators
  ✓ Status of the year

Strategy and implementation
National Open Data Policy
Action plan
Technical Guidelines

Objectives
Valorization Process of the Public Sector Information System

Quality metrics
Monitoring
Annual Report

• Purpose
  ✓ Guide the Public Administrations to implement the annual strategies
• It includes
  ✓ Operative steps for producing and publishing public data
  ✓ Standards, ontologies, licences and data costs
Providing data from the Real Estate Cadastre (REC)
The land information system managed by the Agency

REAL ESTATE INFORMATION SYSTEM

CADASTRE AND CARTOGRAPHY

CARTOGRAPHY
- LAND CADASTRE
- BUILDING CADASTRE

It shows the technical characteristics of the objects and the holders of real estate rights (not for legal evidence). It gives the values used for taxation purposes.

LAND REGISTRATION
(real estate rights and mortgages)

By registering real estate deeds, it manages the information about the transfer of real estate rights and about the mortgages enrolment. **Not** in Trento, Südtirol, Trieste, Gorizia and some municipalities of Udine and Belluno

REAL ESTATE MARKET OBSERVATORY

It collects and processes information from real estate market and continuously shows the real estate values trend.
Mandatory Online Submission (by June 2015)

Achievable thanks to the cooperation of the Chartered Professional Organizations

Digital Preservation

- “WORM” SERVER (Write Once Read Many)
- “PDF/A” DOCUMENTS (Portable Document Format/Archiving)

(by May 2016)
View cadastral services

CHANNEL TO ACCESS CADAstral DATA

• Provincial Office
  (for all users) 25% of all access

• Agency Internet Site
  (for all users)

• Fisco on line
  (for Owners and Professionals)

• Telematic System “Sister”
  (for Professionals – Licensed Surveyors, Notaries and Public Administrations)

• Municipalities Internet Portal
  (only for Municipalities)

www.agenziaentrate.gov.it

http://telematici.agenziaentrate.gov.it
ACCESS THROUGH THE AGENCY WEB SITE

www.agenziaentrate.gov.it

Services without registration

Free of charge for all users

OVER THE WHOLE NATIONAL TERRITORY

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Services without registration

Free of charge for all users

- Access Database
- Land and building cadastral income listings
- Online corrections to cadastral data (Contact Center)
- Search for undeclared buildings - Search particles
- Research *fiducial points for cartographic monography* (Mon)
- Cadastral practice inquiries
- Cadastral service booking appointments
- Use changes - Search particles
Through the «Fisco on line» service, the general public can search and view free of charge, information related to individual properties, by means of:

- Cadastral Descriptive Documents (filed by subject or object)
- Map with land parcels
- Building Plan
- Land Registry Descriptive Documents
ACCESS THROUGH «SISTER» PORTAL

http://sister.agenziaentrate.gov.it/

Signing of an AGREEMENT to join the service
(15 Euros / year for each enabled password)

Over the whole national territory

Different search keys
- Owners
- Cadastral identifiers
- Addresses

Descriptive documents including the Current and historical situation

MAP ABSTRACTS

PLANS *

- Only for subjects enabled to the online submission of cadastral updating documents

It is possible to buy - through the «Sister» channel - the descriptive documents and the map sheets (in CXF, CMF or DXF format). For professionals in the public and private sectors who utilize this bank of information, their range of tools, data and operational procedures will be greatly amplified.

Research and use is free of charge for Municipalities and the Public Administration
Services for public administrations

Using the cadastral data

- HTML via internet
- Interchange system
- Web service via SPC

Municipalities

- Data Interchange on demand
- Structural Mediation

Other Public Administration

Automatic Data Interchange
The Agency has developed the "Portal for Municipalities" that allows access to data through a connection Internet. It includes the ability to access cadastral data for Municipalities and Mountain Communities that are not in possession of the technology requirements to join the Interchange System.
Using the cadastral data

Services available to the Public Administration
[of "Portal" and "Interchange"]

Download of specific dates or incremental data regarding:
- Land Cadastre
- Buildings Cadastre
- Cadastral vector cartography

Specific services for Municipalities
[of "Portal" and "Interchange"]

- surface data supply of building units to ordinary destination (Agency Director Act 29 March 2013)
  - Service that allows Municipalities to report errors relating to surface data
  - Data from automatic change of ownership for Tax management
- control activities of private property not declared in the land registry / situations may no longer be consistent with the land registry with rated for building changes occurred
- control of cadastral update statements
- Buildings not registered in cadastre
- Rurality statements (verification of requirements)
- Telematic acts of Land Cadastre update (daily publication)
- Services for consultation and certification National Archives of City Plans
What is the correcting mechanism of incorrect data in REC like?
INCONSISTENCIES IN THE CADASTRAL DATABASE

There are two categories of errors and inconsistencies in the cadastral database

- **Input errors**
  
  These errors and inconsistencies are corrected by a simple request from the owner (free of charge)

- **Errors made by owner and-or technical professionals**
  
  The errors and inconsistencies are corrected by submitting a new rectification document
There are two ways for owners to contact the Agency for the correction of cadastral data:

- **Provincial Offices**
  (for all users)

- **Agency Internet Site**
  (for all users)
CONTACT CENTER

The service makes it possible to indicate, directly through internet, inconsistencies in the cadastral data and request a correction.
(The applicant can be the owner of the real estate or a person interested in or delegated to make the correction)

PROCESSED CASES

✓ Errors regarding the registered owner
✓ Error concerning the real estate data
✓ Registration of previous non-computerized documents
✓ Inconsistencies related to a non-declared building
✓ Inconsistencies related to a former rural building
Correction of archives data

Provincial Offices

The service makes it possible to report errors and inconsistencies in cadastral data, asking for a correction (The applicant can be the owner of the real estate or a person interested in or delegated for correction)

PROCESSED CASES

- Errors regarding the registered owner
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Consistency and completeness of cadastral data in the perspective of an integrated real estate system

The Agency is currently experimenting with a new program dedicated to managing the Open Data and subsequent errors.
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To set up a complex information data base for the integrated management of data related to the Italian real estate assets.
The finish line for an integrated real estate system

To set up a complex information data base for the integrated management of data related to the Italian real estate assets.

The A.I.I. (Anagrafe Immobiliare Integrata) is a new integrated information infrastructure that, in compliance with the current legislation, uses and integrates data managed by the Agency (cadastral and land registries), created and originally maintained separately. Its goal is to certify, for fiscal purposes, the situation of the integration between the two data bases, aiming at identifying, for each real estate unit, the person holder of real estate rights.
The requirements for quality of real estate data

Digital data **completeness**
Digital data **coherence** with the original documents
**Relationships** between various archives (indice relationships)
**Coherence between data** recorded in each archive (attribute coherence)
**Consistency** of stored information with the existing **situation on the territory**

A **better data quality** will make it possible to provide new integrated search and view services and their **spatial representation**

This spatial representation (in the SIT) will in turn make it possible for:
- **Geographic surfing** through stored data
- A deeper **territorial analysis** of real estate properties (fiscal policies, statistical surveys, assessment reviews)
- A better **control of the territory** (real estate properties verifications)
The development route of the Agency’s cadastral databases

Land Cadastre (LC)
- Cartographic DB
  - 2006-2009
- Descriptive DB
  - 70’s

Buildings Cadastre (BC)
- Plans DB
  - 1995-1999
- Descriptive DB
  - 80’s

Pregeo
1886

1900

1988

1996

2000

1949

The DB completion is in the final phase

The Agency’s cadastral databases:
- Born Land Cadastre
- Born BC
- Automation LC
- Automation BC
- Autom. update LC
- Autom. update BC
- Automation DB plans
- Autom. Mapping LC

Time periods:
- 80’s
- 70’s
- 1986
- 1949
- 1996
- 1995-1999
- 2006-2009
The databases completion and their correlation

- **Cartographic DB**
- **Descriptive DB**
- **Plans DB**
- **Descriptive DB**

**Land Cadastre**

- DB completion: 1998-2015
- Correlation between DB: 2004-2016

**Buildings Cadastre**

- DB completion: 1998-2015
- Correlation between DB: 2004-2016
To monitor the data quality level and assure long-term stability. To achieve maximum performance, it is necessary to have a system to alert
- existent inconsistencies;
- misalignments of correlation indices.

This system, created very recently, is based on two “search engines” that cyclically control the four cadastral databases, updating:
- the list of inconsistencies
- the correlations table
and make it possible for their spatial representation.

The system will make it possible to remove both anomalies through software interventions, and through periodical recovery actions.

Finally, it will be possible to measure and map the level of one or more quality indices, through the aggregation of elementary data.
The cadastral databases monitoring and maintenance

The list of inconsistencies makes it possible to discover the existing anomalies between the territory and the building cadastre, from the point of view of a cadastral database compared to another database.

The elements of the list are grouped in subsets according to their characteristics:

- **1° group** → elements of the LC census database with anomalies in the BC census database or in the cartographic database

- **2° group** → elements of the cartographic database with anomalies in the LC or BC census databases

- **3° group** → elements of the BC census database with anomalies in the LC census database or in the cartographic database

- **4° group** → elements of the BC census database with anomalies in the plans database or in the same BC census database (i.e. address, house number, floor, area, class, etc…)
The correlations table includes the list of all the elements with anomalies in the «relations» between the LC and BC identifiers.

The abnormal elements (the parcels) are grouped in subsets according to their characteristics (non correlated elements, elements with multiple or wrong correlation).

The rules used by search engines, after their implementation in the acceptance procedures for the cadastral updating documents (Pregeo and Docfa), will make it possible to identify inconsistent data (in case of declaration including wrong elements) or to recover them immediately after their input (in case of inconsistencies already existing in the cadastral archives).
The cadastral databases monitoring and maintenance

The activities for recovering data quality have been carried out by the Agency staff through unusual resources, also starting up one of the first remote work experiences between local Offices of a public administration. This remote work experience made it possible to redirect the progressively available resources to the activities up to Offices having a greater workload.

These activities mainly concerned:
- cartographic and census updating
- updating of the holders
- collection of urban real estate units plans
- assessment of the area of urban real estate units
- correlation between land and urban cadastre parcels
- street names recovery and encoding

The mentioned recovery activity made it possible in about 10 years to increase of nearly 20 percentage points a reference index of data quality.

The current general index, as measure of cadastral databases completeness and consistency, is the result of several detailed indicators related to 5 typologies of data: cadastral identification number, owner data, valuation data, address and graphic data. It’s estimated about 95%.
Example of inconsistencies in correlations. In the next future the spatial representation will be carried out in the new Integrated Territorial System (SIT) based on a GIS logic.
MANY THANKS
FOR YOUR KIND ATTENTION