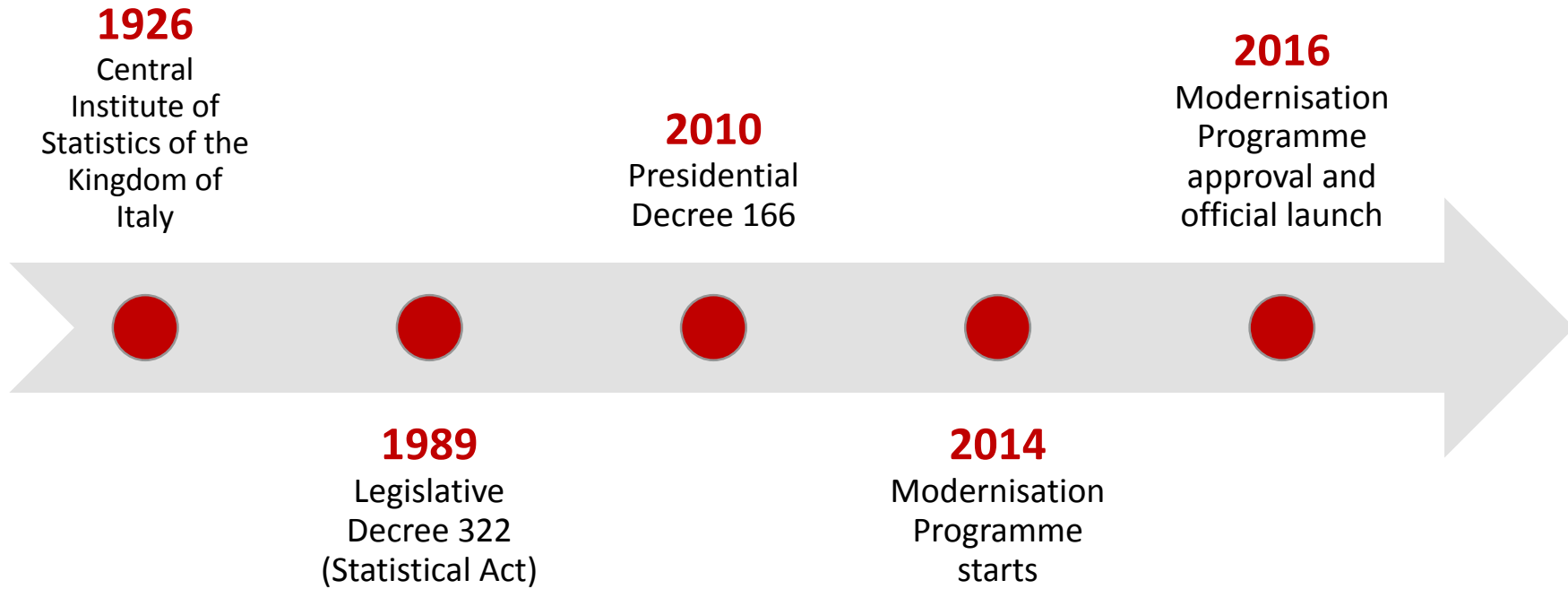# Modernisation in Istat: main achievements in a continued evolution

Giorgio Alleva | President of the Italian National Institute of Statistics

Bilateral meeting Istat and Fso - Rome, 11th January 2018

Istat | Istituto Nazionale di Statistica

Outline

- Main Challenges

- Modernisation process in Istat: main drivers

- Pillars of the modernisation programme

  - Integrated system of statistical registers

  - Permanent censuses

  - Dissemination

- Methodological and thematic research at Istat

Istat | Istituto Nazionale di Statistica

The National Institute of Statistics

1926
Central Institute of Statistics of the Kingdom of Italy

1989
Legislative Decree 322 (Statistical Act)

2010
Presidential Decree 166

2014
Modernisation Programme starts

2016
Modernisation Programme approval and official launch

Istat is a public research institution, scientifically, organisationally, financially and accounting **independent**

Istat | Istituto Nazionale di Statistica

Drivers of Istat's Modernisation: external environment

- Measuring a more complex and diverse society

- Wealth of information, new unstructured sources

- New methodological and technological tools available

- Crisis of traditional data collection systems (high costs and response burden, lower response rates)

- More flexible, agile and cost efficient NSIs
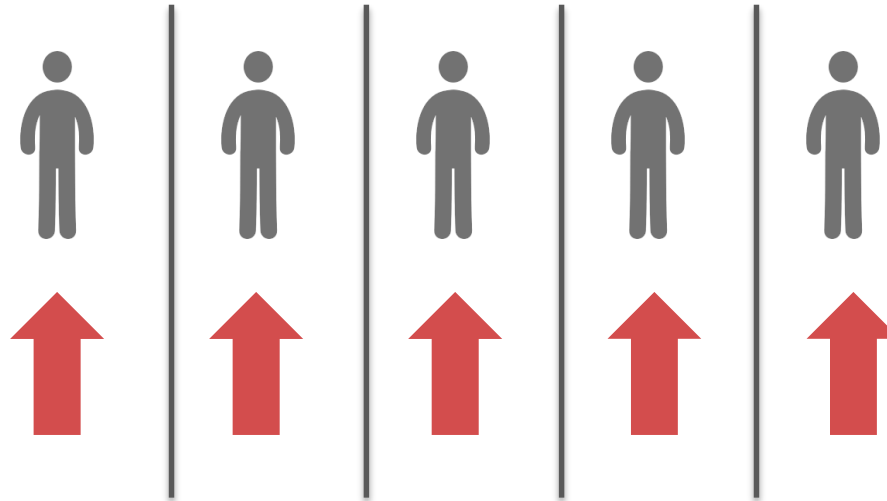
- New competitors on the market

The outside world is changing rapidly

Istat | Istituto Nazionale di Statistica

Drivers of Istat's Modernisation: internal environment

- Organisational silos:
    - Local or vertical *know-hows* do not promote **reuse**;
    - Duplicate and mutually **inconsistent solutions**;
    - Limited **interoperability**;
    - Limited capacity to exploit methodological and technological **opportunities** ;
    - Research and innovation at departmental rather than **corporate level**.
- Segmentation
- Weak governance system:
    - Difficult access to existing **general services**;
    - Costly efforts to obtain services at the local level, generating **redundancies and inefficiencies**.

Istat | Istituto Nazionale di Statistica

From divisional…

Divisional structure:
silos «tied» to people

- DUPLICATED WORK AND INEFFICIENCIES
- WORK «TIED» TO SPECIFIC PERSONS
- BARRIERS

Istat | Istituto Nazionale di Statistica

A thorough review of the organisational structure

...to a process-based structure

Centralised Organisational Structures

Horizontal integration
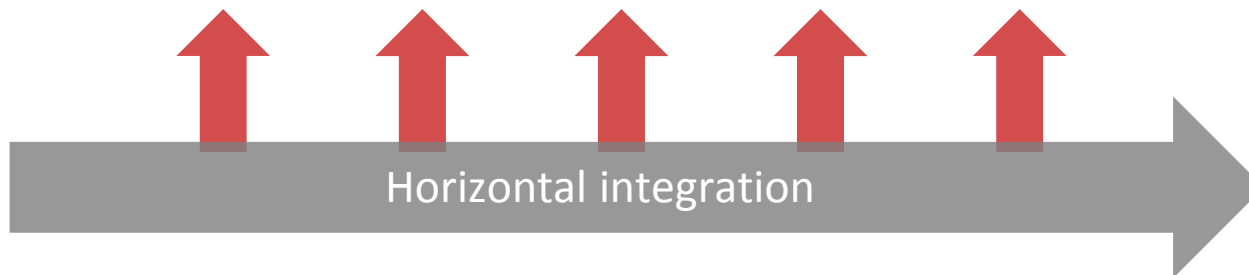
Process-based structure:
business-like approach

Istat | Istituto Nazionale di Statistica

Istat's New Organisational Structure
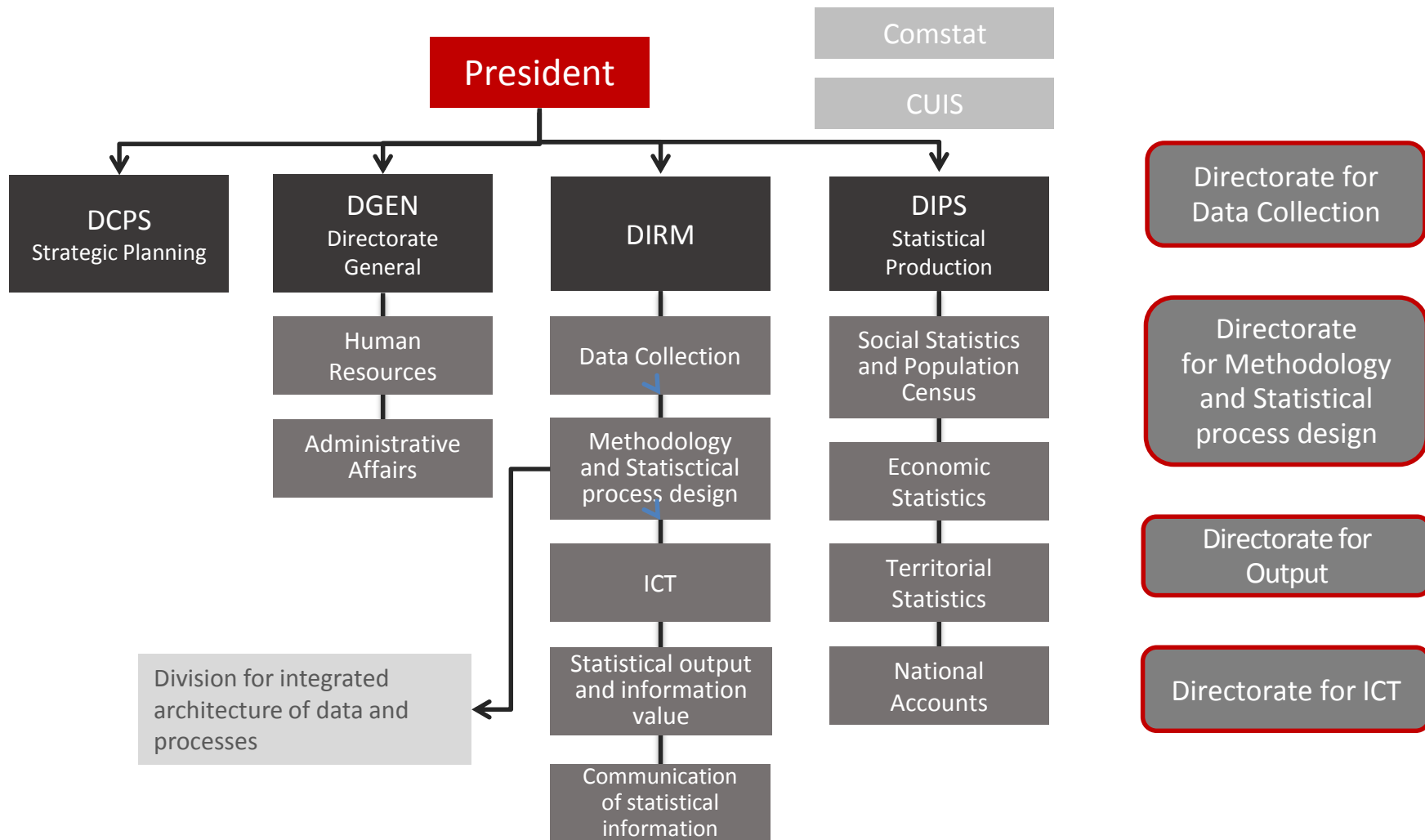
Process revision: main features

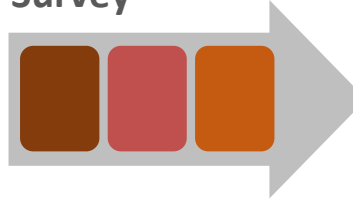**Undefined process**
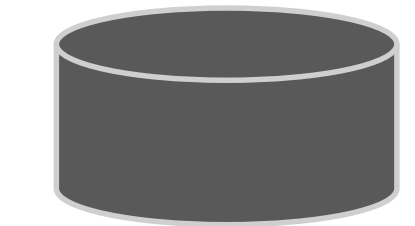
Defined process

Survey 1
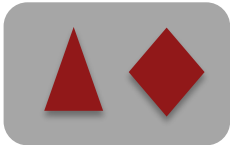
Survey
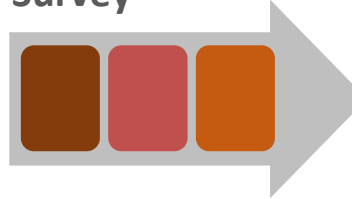
Survey 2

Survey
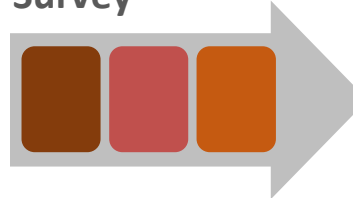
Survey 3

Survey

Centralised assets

Integrated System of Statistical Registers

A single logical data asset resulting from the **integration** of survey data, administrative data and new sources

Consistency in the **identification** and **estimation** of units and variables for the system as a whole

A "**system**", rather than a set of registers
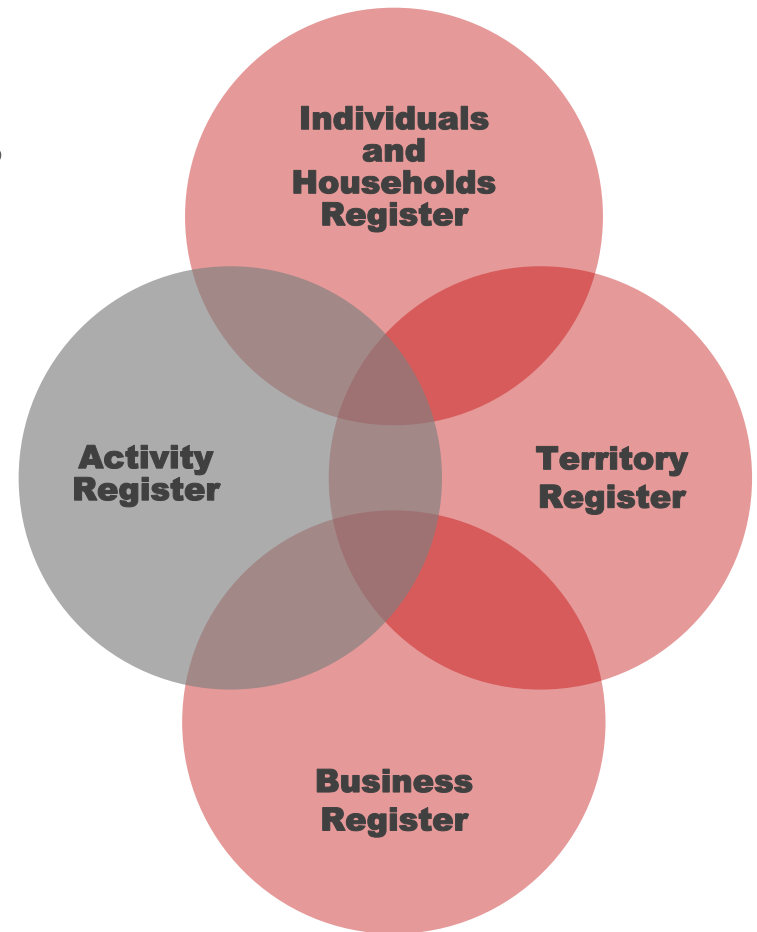
To connect people, business, places and their relations

Individuals and Households Register

Activity Register

Territory Register

Business Register

Traditional role

New challenges of the traditional role

- Observe elusive or hard to reach populations not captured in the ISSRs

- Integrated survey framework

Enhancing quality and contents of the ISSRs

- Units

- Variables

- Census

Supporting the statistical process using new data sources

Istat | Istituto Nazionale di Statistica

How to deal with uncertainty

1. **Simply ignore** (traditional solution): simple, but at risk of severe bias.
2. **Evaluate** the sources of errors to inform users (Eg. PES): lack of consistency of different production lines, 2 lines of production.
3. **Identify improvements** in the register building process : continuous improvement/ the identified bias is still present.
4. **Correct bias** in the main estimates (External Benchmarks) without modifying the register: lack of consistency of different production lines, 2 lines of production.
5. **Modify units and variables in the register to correct bias** in the main estimates: consistency of different outputs, relevant computable efforts, some outputs may be inaccurate (transfer the uncertainty to the microdata level).

A strategic issue for NSIs (responsibility and transparency)

Istat | Istituto Nazionale di Statistica

Istat's new permanent censuses

According to the modernization strategy, Istat has launched the permanent censuses project

2016
Public institutions

Non-profit institutions

Results for the year 2015 published in 2017

2018 Population and housings

2019 Enterprises

The permanent censuses will cost less about 40% less than the old censuses
(around 270million)

The Census and Social Surveys Integrated System (CSSIS)

The CSSIS consists of two phases:

1. **the phase supporting the objectives of the Population Census;**

2. **the phase supporting the objectives of Social Surveys.**

The first phase (Master sample)

Planned to be held, yearly, in Autumn (starting from 2018), with the aim of:

- **correcting** the Base Register of individuals for under and over coverage, thus improving the quality of the population totals produced;
- **collecting** information for not replaceable variables by means of an ad hoc sample survey (Master Sample)

The first phase can be carried out following two different schemes: the component based on an area sample (A) and the component based on a sample list (L).

The second phase

It takes place throughout the year, following the first phase (i.e. from January 2019) Sample households are selected as a sub-sample of those already involved in the first phase sample

Research at Istat

Balancing the **independence** of research and its **relevance** for responding to the effective needs of production is crucial for NSIs (Fellegi, 2010)

Legislative Decree no. 218/2016 lists Istat among the **public research bodies**

A renewed role for research, thanks also to the Programme **"Development of the methodological and thematic research"** included in the **2017-2019 Three-year Strategic Plan** and strengthened in the **2018-2020** Plan

Istat's new **Statute** emphasises research activity

Deep investment on methodological and thematic research

Istat | Istituto Nazionale di Statistica

Istat has recently set up some **infrastructures** for managing research activities

☐ **Three-year plan of thematic and methodological research**

☐ **Innovation Lab** (Blue Sky Research)

☐ **Advisory Board** (for methodological research projects) and **Scientific Committee** (for thematic research projects)

☐ **Laboratories** for thematic research

Launch of two **Call for research projects** in 2017

Methodological research questions

① How to **integrate new and old sources** and to **increase the effectiveness of direct surveys?**

② How to ensure the necessary **cross-cutting and longitudinal consistency** of register-based estimates?

③ How to measure the **quality of a big data founded statistics,** or, in other words, how must the classic inferential statistical approaches (design, model, or Bayesian) be modified to make the construction of robust inferences possible from the new databases?

④ What is the necessary **technological/information architecture** to make the best of the new data bases?

⑤ How to modify the traditional approach to **quality evaluation in a multi-source environment**?

Methodological research areas and projects

| Research areas	Project
1. Integrated system of registers	Integration of administrative sources and survey data through Hidden Markov Models for the production of labour statistics
	Balancing Methods for Ensuring Time and Space Consistency of Demographic Estimates in the Italian Integrated System of Statistical Registers
	The Italian integrated system of statistical registers: design and implementation of an ontology-based data integration architecture
	The anticipated variance as a measure for the accuracy of complex multisource statistics
2. Census obtained by data integration	Census and social surveys integrated system
	Methods for treating bias deriving from different sources of non-sampling errors in mixed mode social surveys
3. Big Data	Text mining and machine learning techniques for text classification, with application to the automatic categorisation of websites
	Use of internet data in Official Statistics: a proposal for a methodological framework
4. Unique process	On the design and implementation of a generalised process for business statistics

Thematic research topics

1. Low Italian growth: causes, consequences and policies
2. The productive system: selective effects of competition
3. Labour market: trends and transitions
4. Population and family structure and dynamics: emerging models and behaviour continuity
5. Social transformations, behaviours, cohesion and exclusion
6. Economic and social aspects of inequality and poverty
7. Health conditions, survival and access to care
8. Equity and sustainability of Well being
9. Environment, territory and networks: man-made pressures, climate changes, territory specialisation, sustainable development

Thematic research call for projects

77 research proposals (all the topics are covered)

335 people involved, the 15,3% of the whole Istat's personnel

| Topic	Value
The productive system	29,1
Health conditions, survival and access to care	17,7
Population and family structure and dynamics	17,7
Low Italian growth	17,7
Environment, territory and networks	16,5
Social transformations	16,5
Equity and sustainability of Well being	10,1
Economic and social aspects of inequality and poverty	8,9
Labour market	8,9
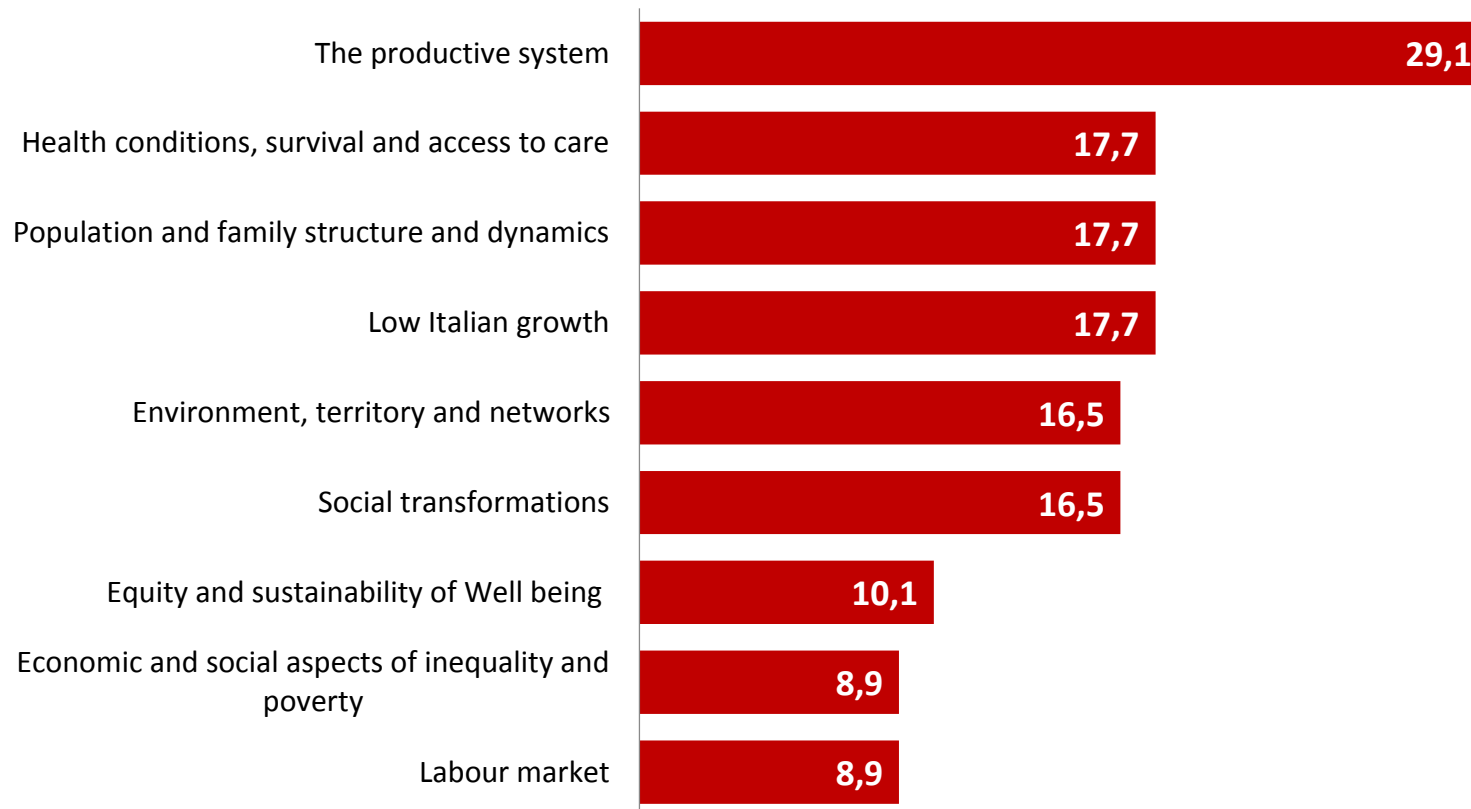
The Linked Open Data portal

The portal is the **single access point t**o Istat's open data and part of the Italian national data cloud

Main features

- machine-to-machine data

- access at the finest granularity level

- flexible querying

- advanced navigation mechanisms

- direct access to data via Web Services
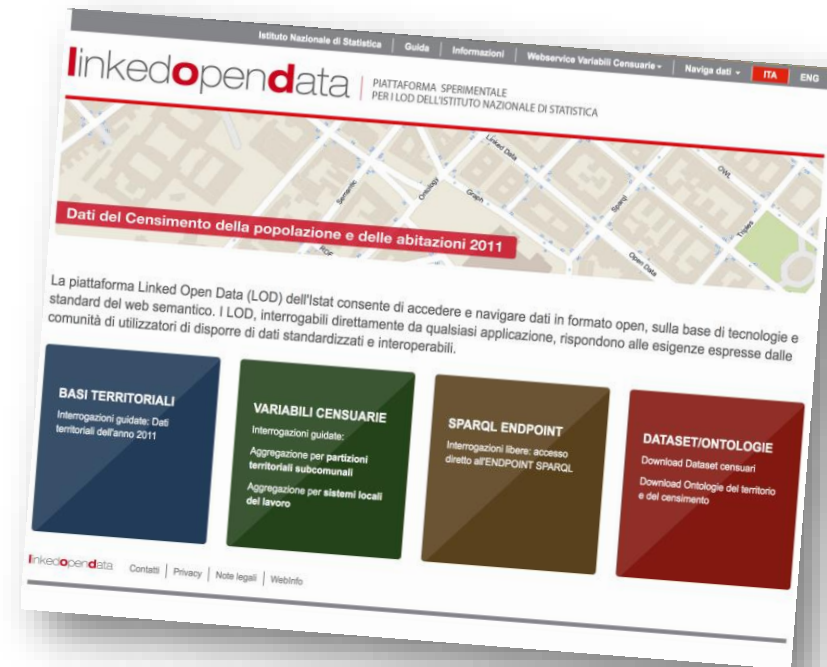
Open data is a key enabler of data-driven innovation

Conclusions. Key concepts

Modernisation to produce high quality data

A new organisational and production approach

Multiple use of data sources: integration

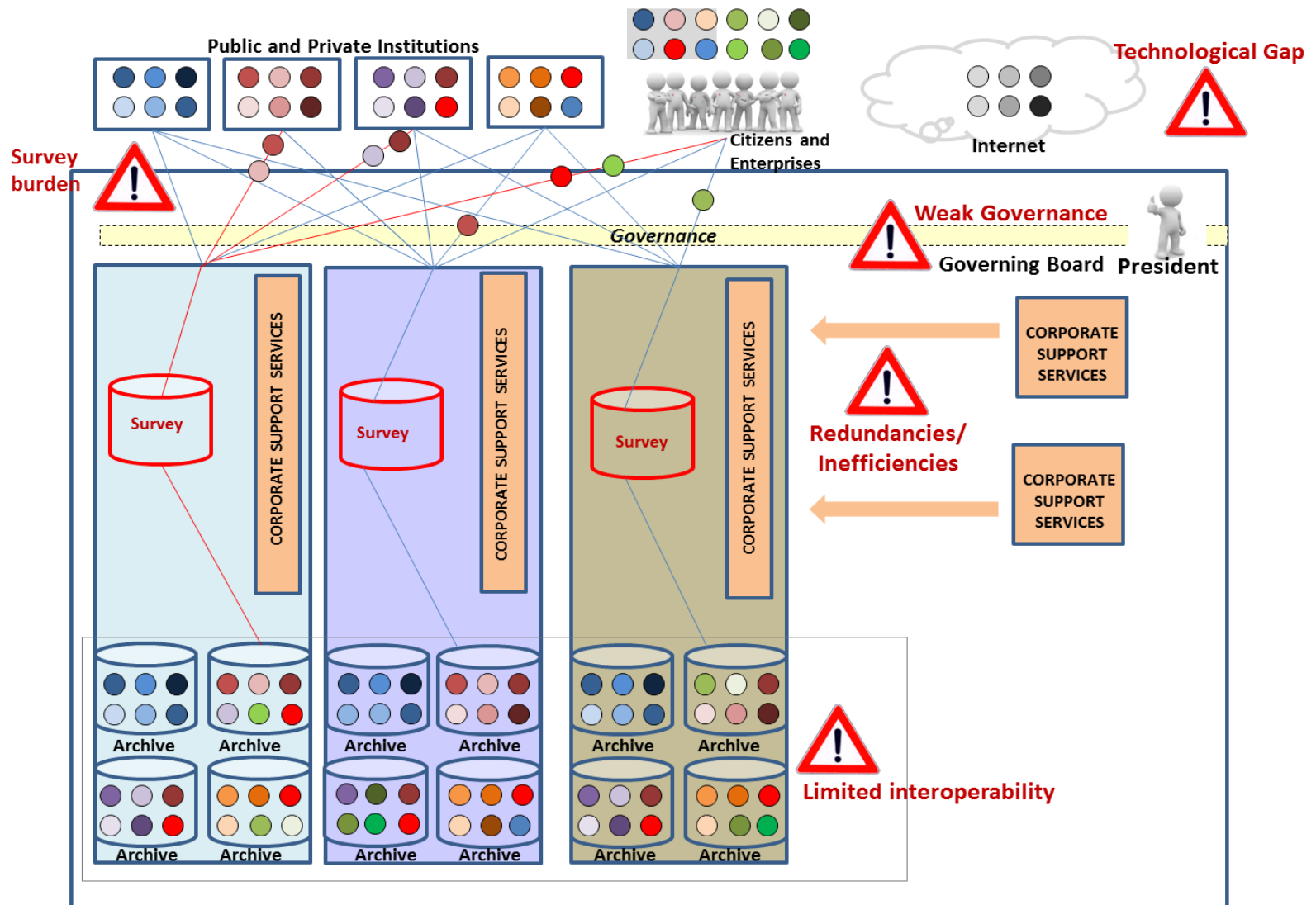Improve data release for all users

Skills and competencies

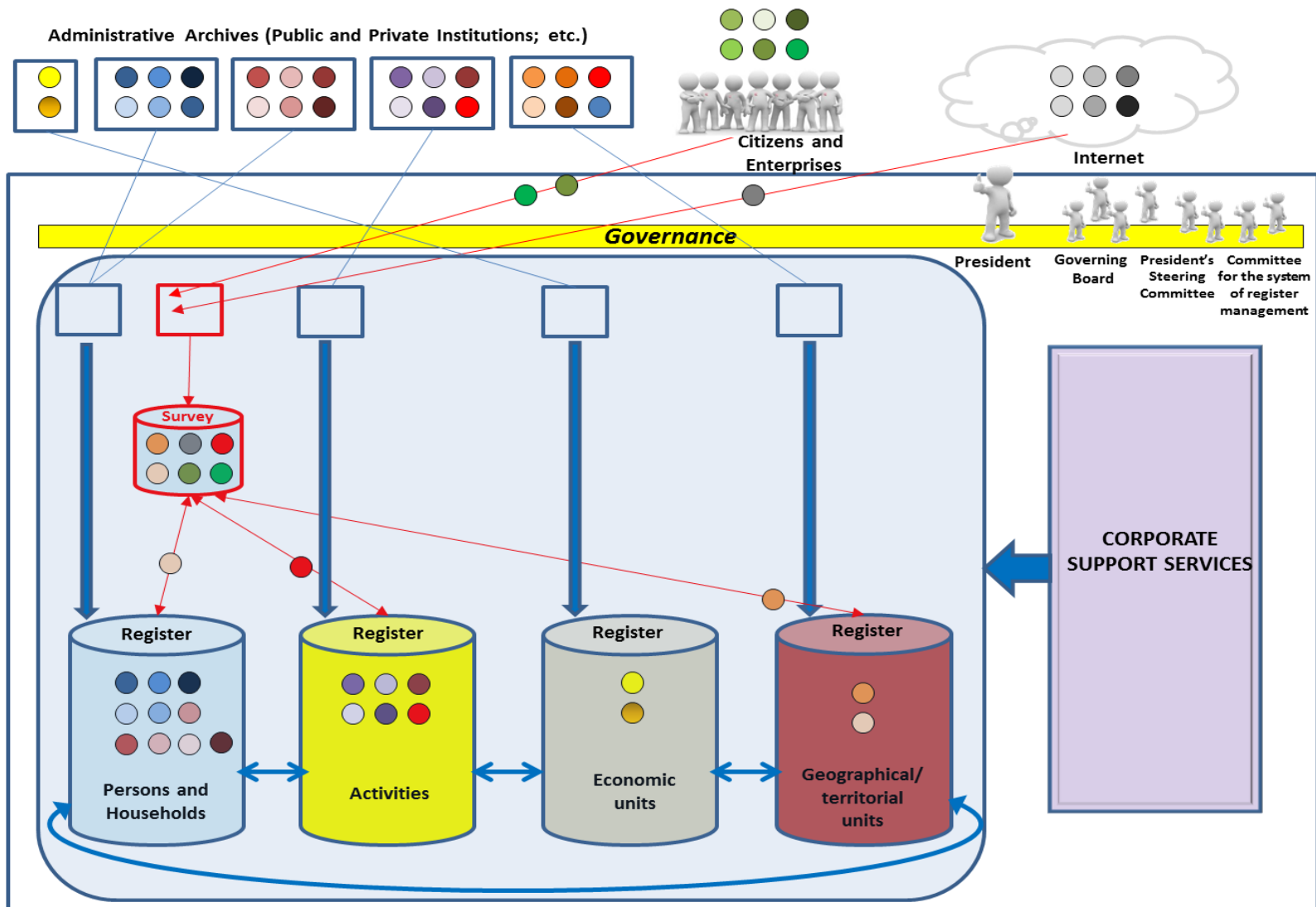Innovation and Research

Change-oriented culture

Modernisation in Istat: main achievements in a continued evolution

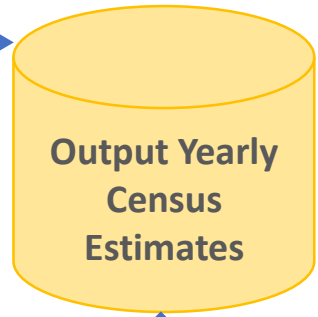**Giorgio Alleva** | President of the Italian National Institute of Statistics

Istat | Istituto Nazionale di Statistica

Administrative Archives (Public and Private Institutions; etc.)

Citizens and Enterprises

Internet

Governance

President
Governing Board
President's Steering Committee
Committee for the system of register management

CORPORATE SUPPORT SERVICES

Survey

Register
Persons and Households

Register
Activities

Register
Economic units

Register
Geographical/ territorial units

Istat | Istituto Nazionale di Statistica

The Census and Social Surveys Integrated System

Population & PR

Census and Social Surveys Integrated System (CSSIS)

Master Sample

Output Yearly Census Estimates

Over-coverage

Under-coverage

First phase survey round

Second phase survey round

Population

Prototype RBI Replaceable Variables

?

Areal Population Coverage

List

Not replaceable Variables & Over-coverage indicators

L F S

L C S

E U S I L C

Partially Replaceable

Harmonised

Specific

C E S

Variables

RBI

?

Population

From prototype...

...to Register