Transition to JDemetra+ in a centralised system for seasonal adjustment: issues and benefits

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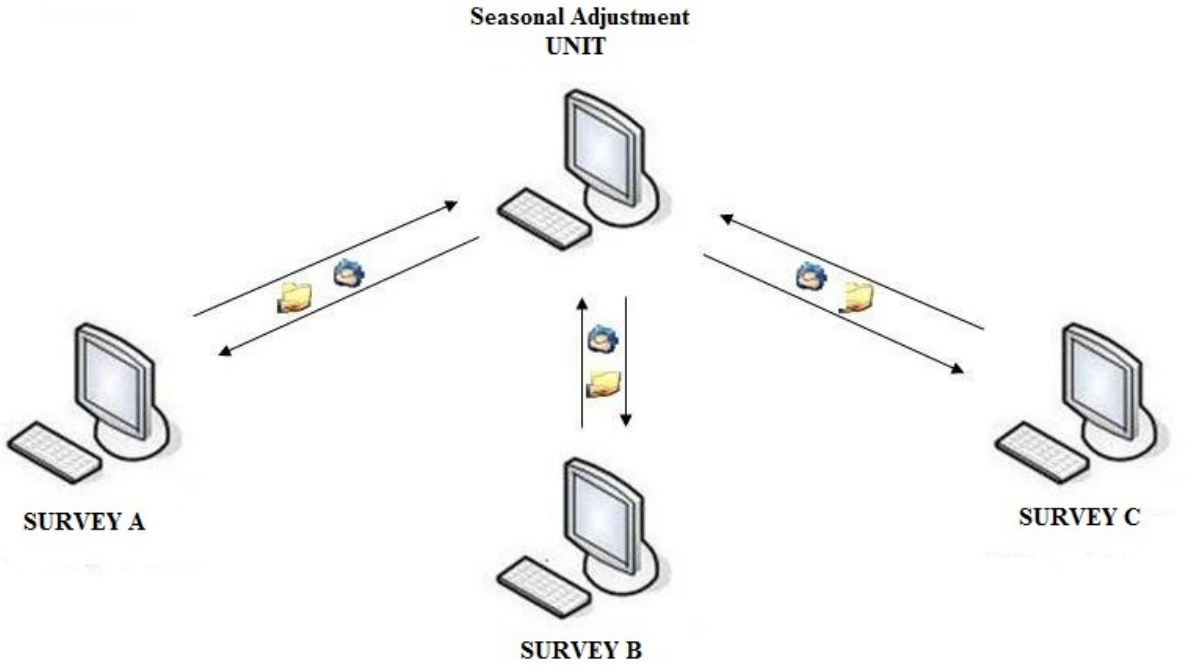
Seasonal adjustment: a producer's point of view

- Seasonal adjustment is a complex and highly specialised activity especially when model based approach is used
- In addition to technical and dissemination issues there are also other constraints, like those deriving from international recommendations or, in the EU case, by the European harmonization framework laid out in the ESS guidelines (tools, pre-treatment, decomposition, diagnostics, revision policies, dissemination)

Former Istat organisational scheme for seasonal adjustment



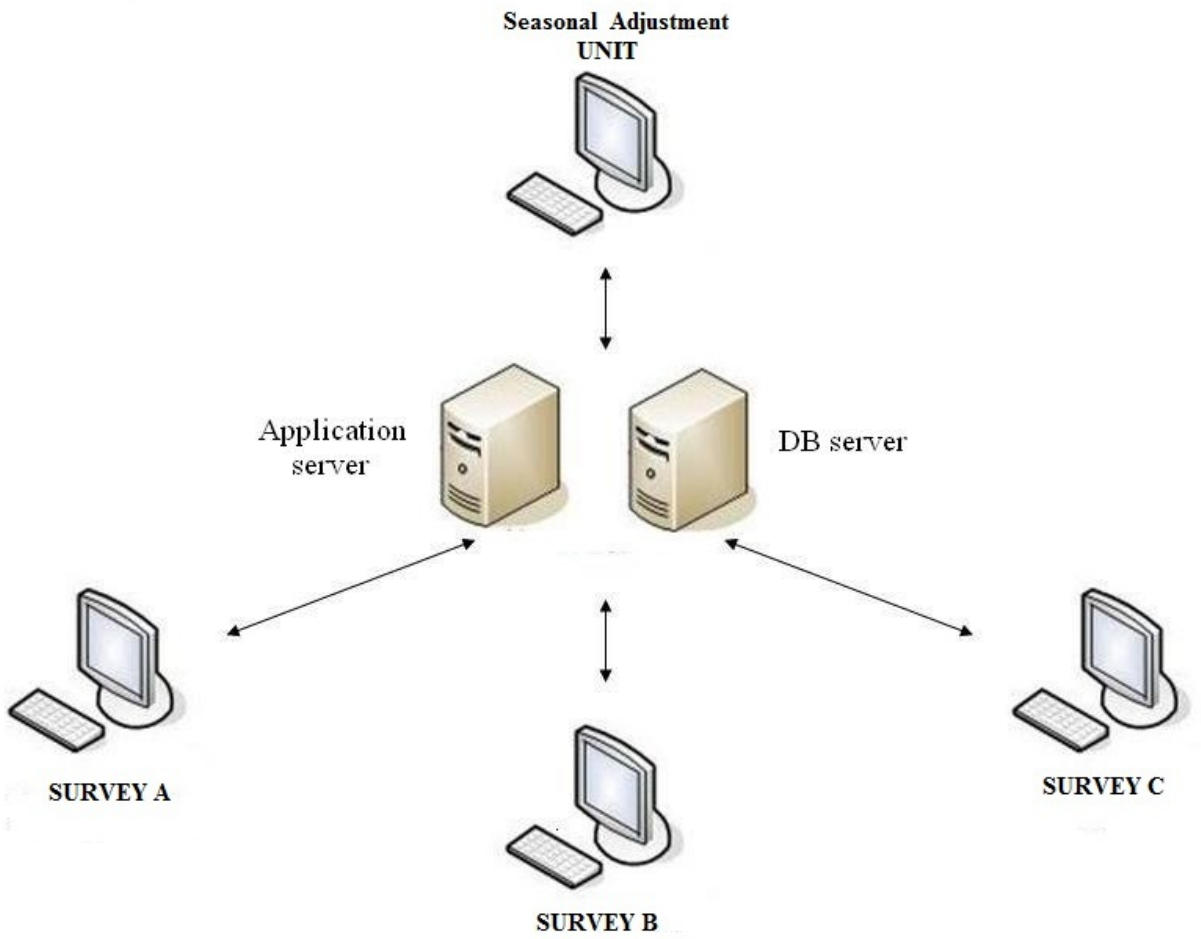
Main events and features of sa in Istat in the last decade

- Increase of domains and number of time series adjusted
- New requests from the ESS guidelines on seasonal adjustment
- Continuous updates of the seasonal adjustment software TRAMO-SEATS
- Few human resources involved in the seasonal adjustment process

Two main needs:

- Efficient data organization and storing
- A general interface to TRAMO-SEATS usable by everyone everywhere

SITIC, a centralised information system



SITIC, a centralised information system

Benefits

- Standardization
- Efficiency
- Cost reduction
- Common practices among different domains
- Easier implementation of European guidelines

Costs

- HR intensive project (both statisticians and IT experts)
- Rigidity in treatment of peculiar and limiting situations

SITIC: the centralised information system in ISTAT for sa

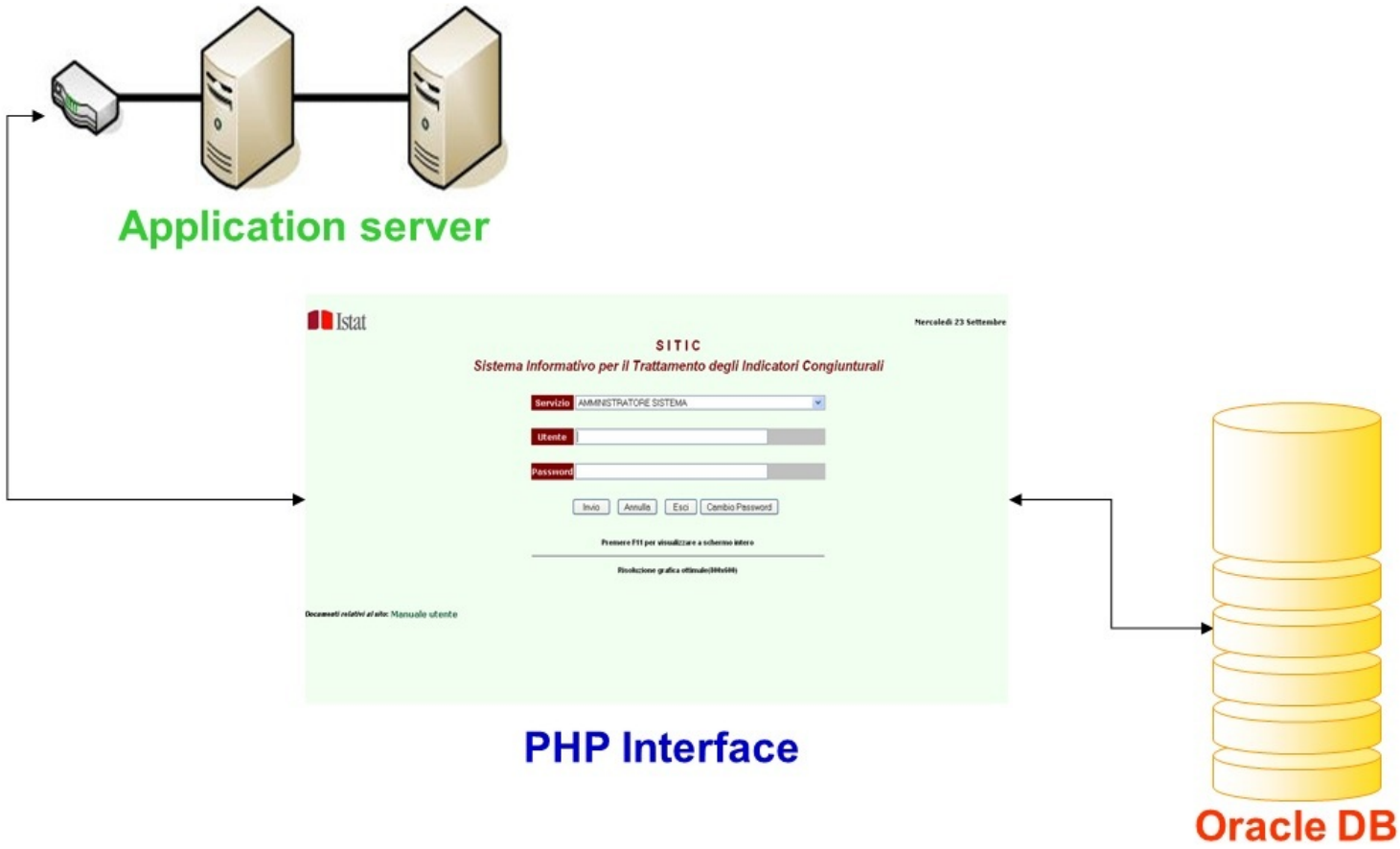
Able to handle all the downstream stages following the validation of unadjusted data

- Seasonal adjustment implementing
  - direct approach as well as indirect approach
  - concurrent, partial concurrent and current adjustment
- Vintages storage of original, seasonally adjusted and calendar adjusted data
- Vintages storage of Reg-Arima models
- Generation of SDMX objects for feeding to Istat and Eurostat data warehouses.

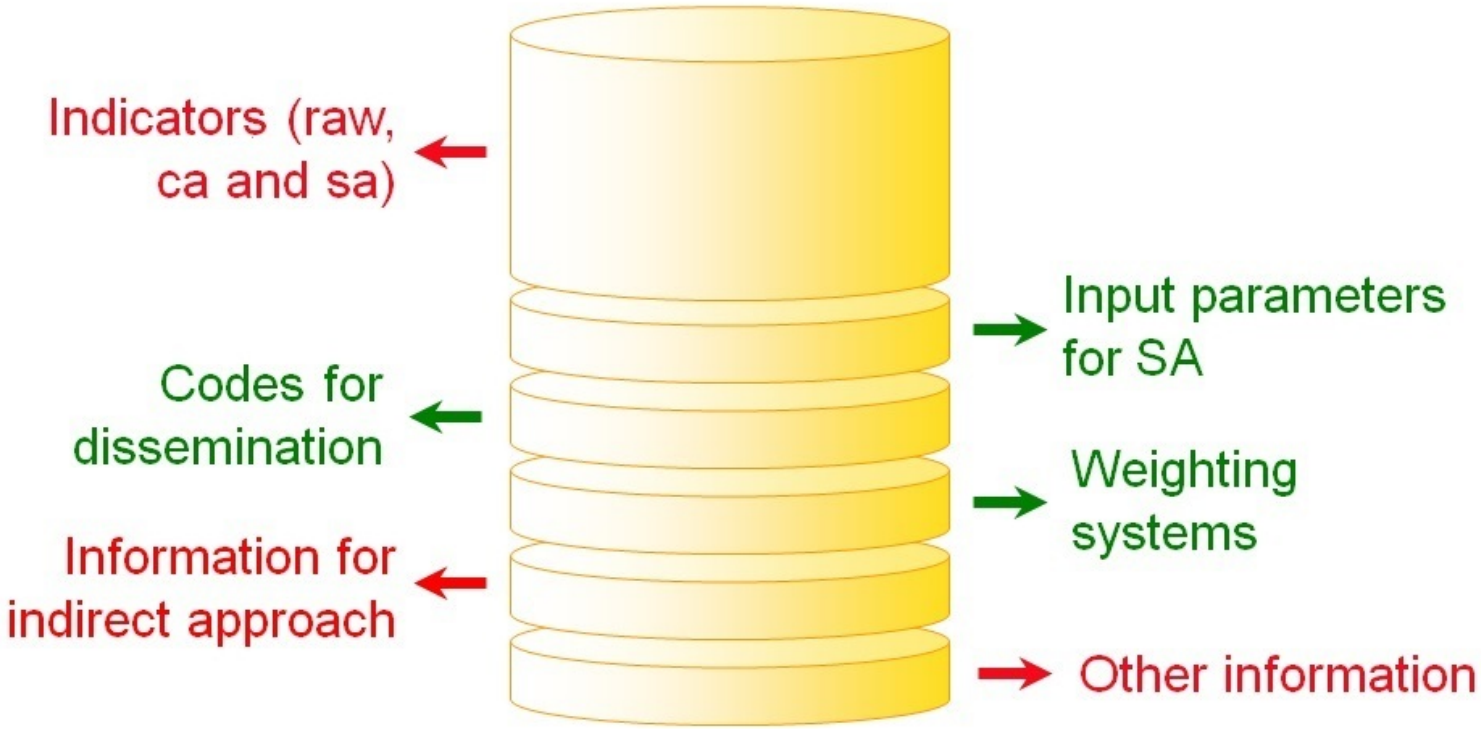
SITIC building blocks

1. ORACLE database
2. Seasonal adjustment software
3. Web application accessed by users via web browsers

A synthetic representation



A representation of the ORACLE repository



The ORACLE repository for seasonal adjustment

- Connections with surveys' databases
- Main tables containing: models, dissemination, type of adjustment, aggregation, weights
- 26 surveys using SITIC, approximately 40 000 unadjusted time series and 1 200 adjusted series ($\approx$ 1 000 through the direct approach and $\approx$ 200 through the indirect approach). Almost 200 non seasonal series periodically checked for seasonality.

The web application

- Data download/upload
- TRAMO-SEATS input generation, execution and output recovery
- Aggregation
- File generation to feed Eurostat and Istat datawarehouse

The seasonal adjustment software

- Several versions of TRAMO-SEATS
- Latest versions of TRAMO+ and SEATS+

A focus on the indirect approach

- Several aggregation functions implemented: sum, difference, ratio, weighted averages, etc.
- Several weighting systems supported: fixed, changing every 5 years and annual
- Aggregation of both rebased and chain linked indices

The indirect approach of chain linked indices according to SA guidelines

$$\text{Unchaining} \rightarrow \text{Aggregation} \rightarrow \text{Chaining}$$

- Pros
  - Easy to be implemented
  - Annual weights used to aggregate both unadjusted and calendar/seasonally adjusted indices
- Cons
  - Inefficiency
  - Calendar adjustment of annual weights when calendar effects are statistically significant

The indirect approach of chain linked indices in SITIC

Ad hoc annual weights $\rightarrow$ Aggregation

- Pros
  - Aggregation of chain linked indices
  - Efficiency
- Cons
  - *Ad hoc* annual weights: dependency on the aggregation level and lack of additivity

JDemetra+: Istat experience

Present use in seasonal adjustment:

1. Specification of ARIMA models, calendar variables, outliers, auxiliary variables through JD+ on personal PC during the annual models revision
2. *Translation* of the identified options into Tramo-Seats syntax
3. Uploading of the new specifications to Sitic
4. Routine seasonal adjustment through Tramo-Seats at centralised level (Sitic)

Introducing JDemetra+ into Sitic

- Goal is to introduce JD+ as a further sa engine into Sitic for use in batch mode
- This would allow batch execution of sa, and recovery of adjusted data
- At the same time we need to use JD+ GUI for the annual models revision, with the possibility to save JD+ interactive work sessions, decoding JD+ specifications and storing them in Sitic
- Generation of customized quality reports and standard metadata reports

Benefits and costs of the project

Benefits

- Increased safety on the software side
- Closeness between specification stage and routinely seasonal adjustment
- Better quality control of seasonal adjustment
- Availability of both Tramo-Seats and X13-Arima-Seats
- Opportunity to use and develop JD+ plug-ins to cope with benchmarking and reconciliation.

Costs

- Add a dependence on Java
- Weaker process control due to lack of expertise about Java among statisticians
- Lack of expertise on seasonal adjustment among IT Java experts

Final remarks

- Performing SA in a centralised system offers several advantages: standardization of procedures, cost reduction, efficiency, flexibility
- A centralised information system is a powerful tool for many goals other than SA: revision analysis, dissemination policy, storage of data, implementation of best practices of European Guidelines.
- Transition to JD+ in the Italian Centralised System will offer several practical benefits
- Main obstacles to the implementation of this project: high costs in terms of specialized HR, needs of a high cooperation among statisticians and JAVA experts