



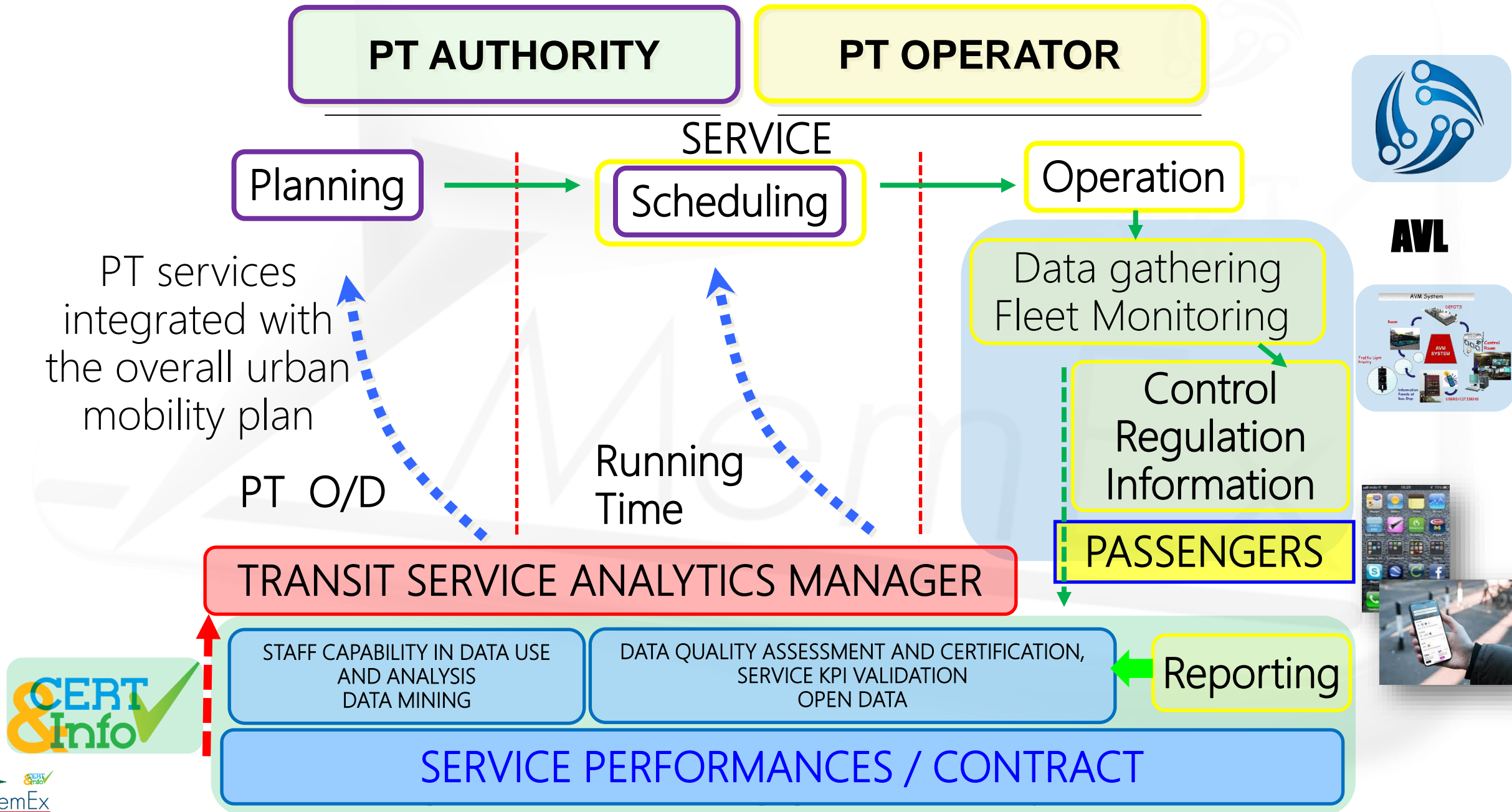
Session 3-C: Data Quality and Governance

CERT&Info module, an advanced tool for the assessment of
Public Transport service performance:
results of two case studies in the Tuscany Region

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and
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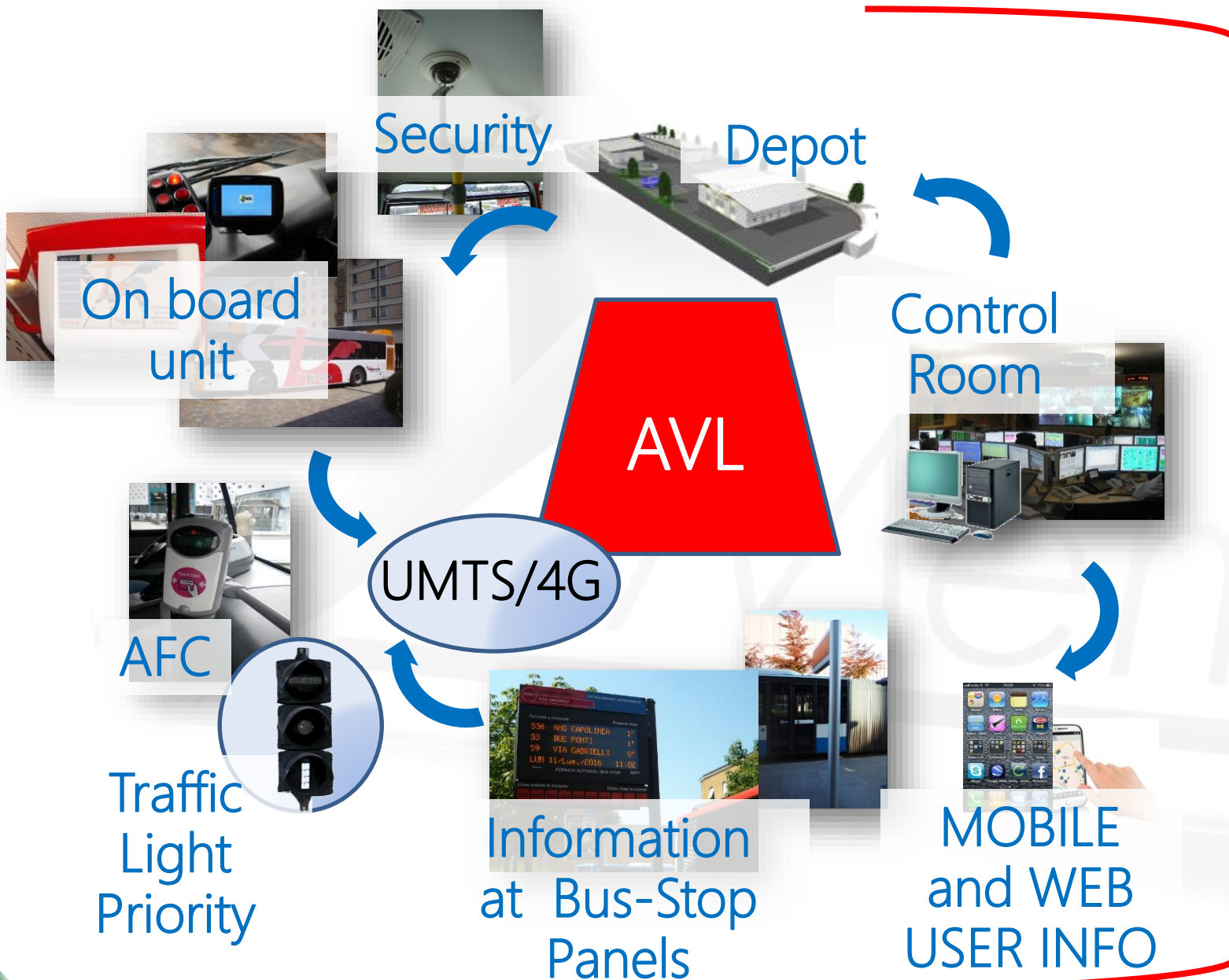
12th August 2020

CERT&Info in the Public Transport chain



AVL

CERT&Info Tool



Data gathered by AVM/AVL system
«**COLLECTED DATA**»

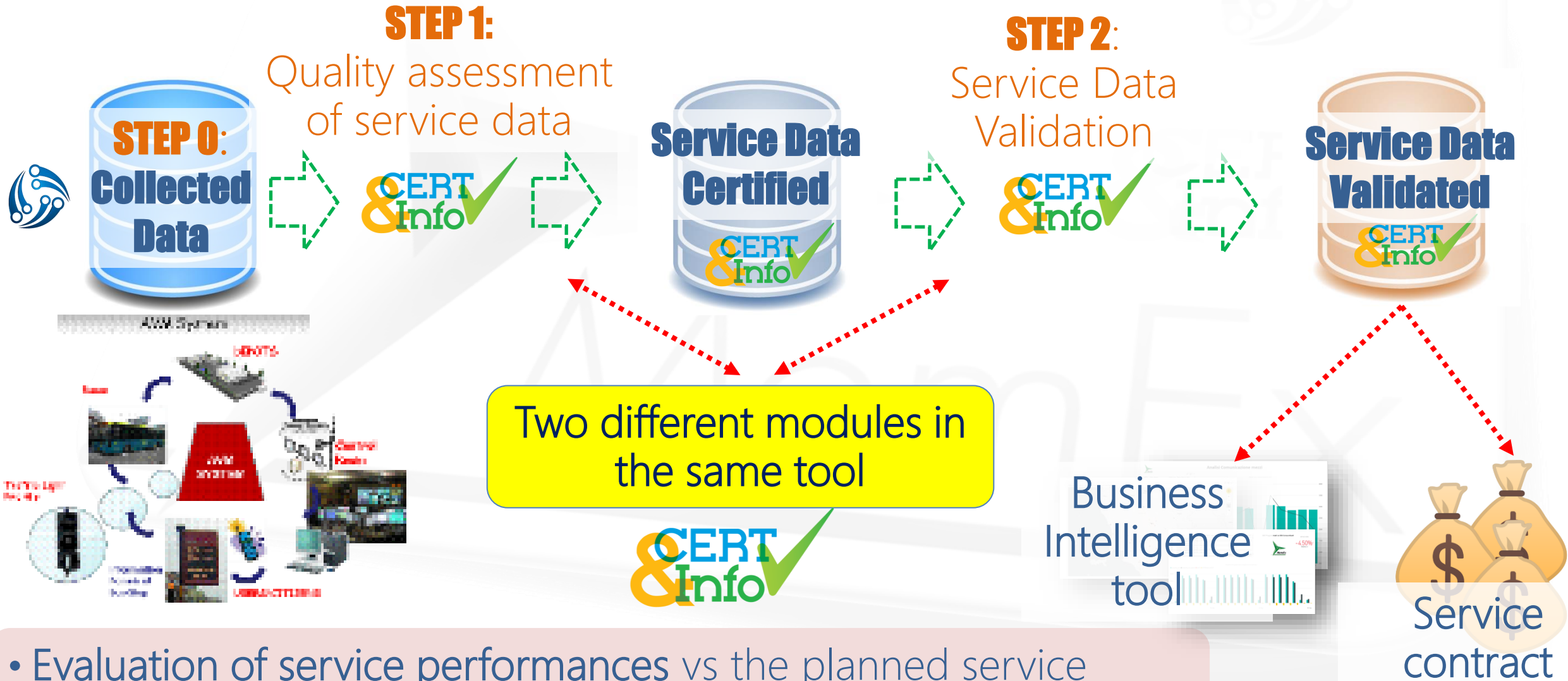
Data collected are verified from the technical point of view
«**CERTIFIED DATA**»



Once certified, data are assessed from the operational point of view
«**VALIDATED DATA**»

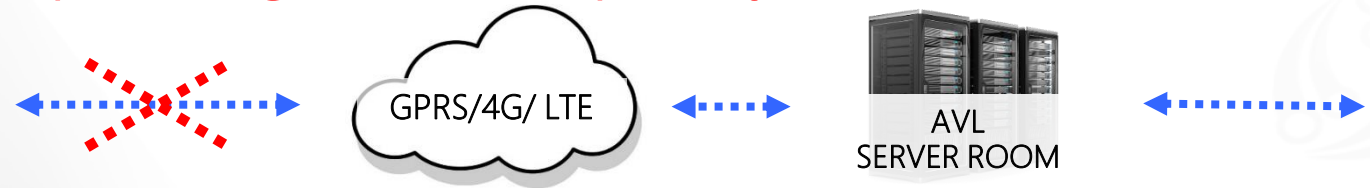


CERT&Info: main steps

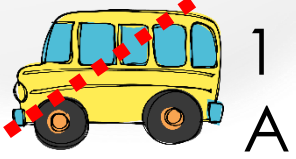


- Evaluation of service performances vs the planned service
- Evaluation of service contract commitments and indicators

Problems impacting on the quality of AVL collected data



Problem Category	Generating factor	Problem occurring	Required Actions on AVM reported data
Technical	Failure blocking on-board system running	Lack of data	Use planned data
Technical	Temporary failure of communication with central system	Lack of real-time data	Use of off-line data collected by the onboard T Ex-post certification of positioning and delay
Technical	AVM failure in identification of bus on the service	Lack of on-board data on vehicle positioning and delay at timing points	Use of off-line collected by the onboard T Ex-post certification of positioning and delay
Technical Operational	Inconsistent geo-located data of network nodes (in service programming)	Lack of on-board data on transits at network nodes	Use of off-line data
Operational	Failure assignment of bus to next service	Lack of on-board localization data on operated service	Use off line data Reporting of positioning data



Case Study 1: Piombino area

129,88 Km2 - 34.000 inh.
TIEMME Fleet size: \approx 100 buses

**CERT&Info
STEP 0**

**CERT&Info
STEP 1-2**

Total number of daily scheduled rides	773	
Detected “Anomalies” by CERT&Info		
Advanced departure time	28 (3,6%)	18 (2,3%)
Arrival and the scheduled time diff.	9 (1,2%)	4 (0,5%)
Ride and the scheduled length diff.	25 (3,2%)	25 (3,2%)
Ride and the scheduled duration diff.	168 (21,7%)	36 (4,7%)
Rides unreported by the AVL	157 (20,2%)	53 (6,9%)
Operated and scheduled service data compliance	50,0%	82,5%

TIEMME S.p.A.
Main Transport
Operator in the
South of
Tuscany



Problems
identified:
90% operational
10% technical

Team efforts reduction over the 25%

Case Study 2: Siena area

118,53 Km2 - 52.000 inh.
TIEMME Fleet size: \approx 250 buses

**CERT&Info
STEP 0**

**CERT&Info
STEP 1-2**

Total number of daily scheduled rides

3118

Detected “Anomalies” by CERT&Info

Advanced departure time

42 (1,3%)

27 (0,9%)

Arrival and the scheduled time diff.

47 (1,5%)

19 (0,6%)

Ride and the scheduled length diff.

14 (0,4%)

11 (0,3%)

Ride and the scheduled duration diff.

57 (1,8%)

45 (1,4%)

Rides unreported by the AVL

321 (10,3%)

112 (3,6%)

Operated and scheduled service data
compliance

84,6%

93,2%

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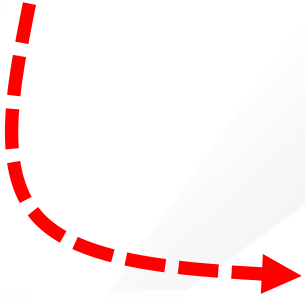


Problems
identified:
25% operational
75% technical

Team efforts reduction over the 25%



Conclusions



Service data
quality
assessment
and validation
to detect:

Failure of on-board system running

Temporary failure of communication
between on-board and central systems

AVL failure in the identification of
vehicle localization

Inconsistent geo-located data of
network nodes (in service
programming)

Failure assignment of bus to next
service

Technological level

Problem types solved:

- AVM System
- Communication system

Operational Level

Fields of interest:

- Planning (service optimization)
- Service and resources management

Thank you!

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