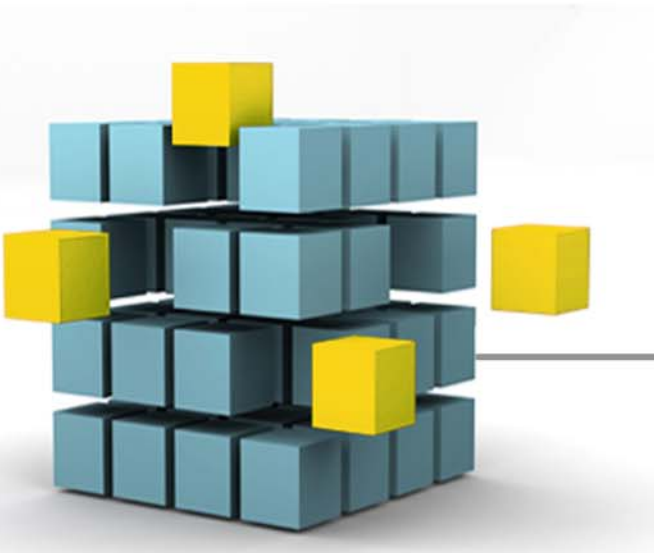


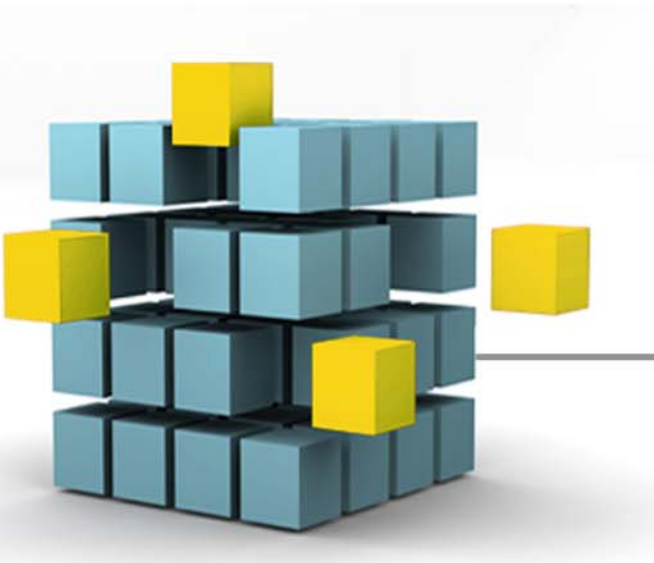
# Upgradeable devices for ticketing as a base for innovation

Gianni Becattini - AEP



# AFC systems market

Some notes





# Critical factors for market development

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## Differences

different companies, even within the same region, set to AFC systems different constraints, either for strategic reasons or for continuity with time consolidated solutions

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## Dynamism

initial requirements, also for external actions (e.g. specifications by Supervision Authorities), are often modified during the implementation work

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# Critical factors for market development

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## Evolution

AFC are not static and naturally evolve to follow Company needs and market requests

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## Timing

Length of tender and startup time can introduce further needs for modifications.

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# So, the picture is that...

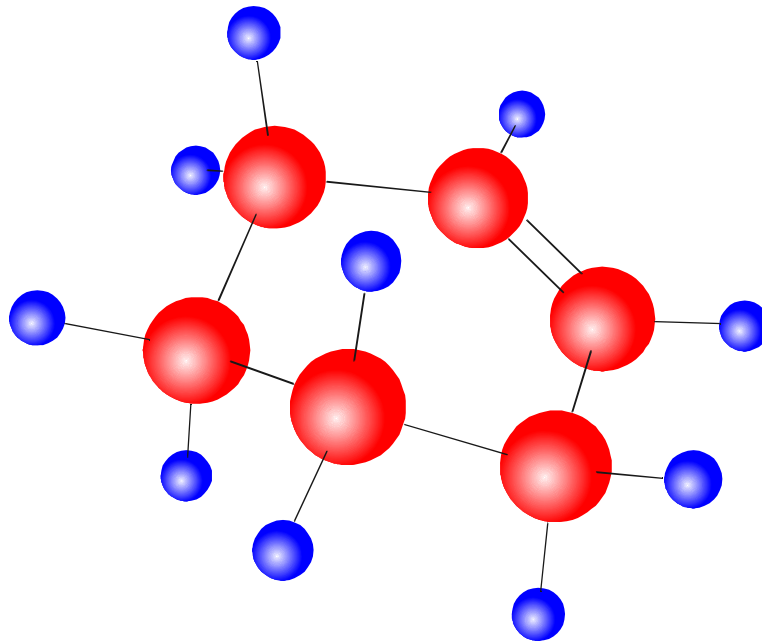
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- Different companies asking for different solutions;
- Companies asking for changes in the initial solutions, sometime also for the length of the startup;
- Companies that in the future shall ask for further evolutions, for example to integrate with other companies.



# A limit to technological evolution

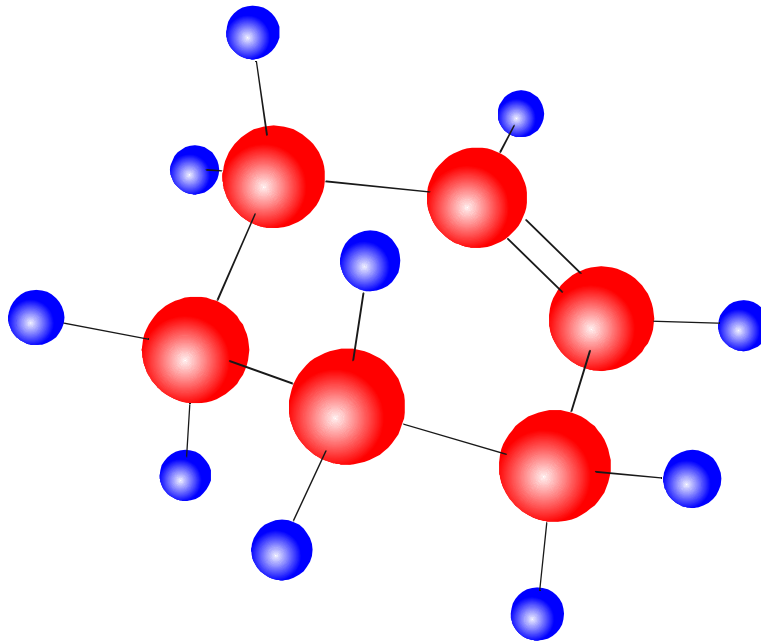
- In closed and proprietary systems “atoms of software” and “atoms of hardware” are often indissolubly linked in rigid structure.





# A limit to the system life

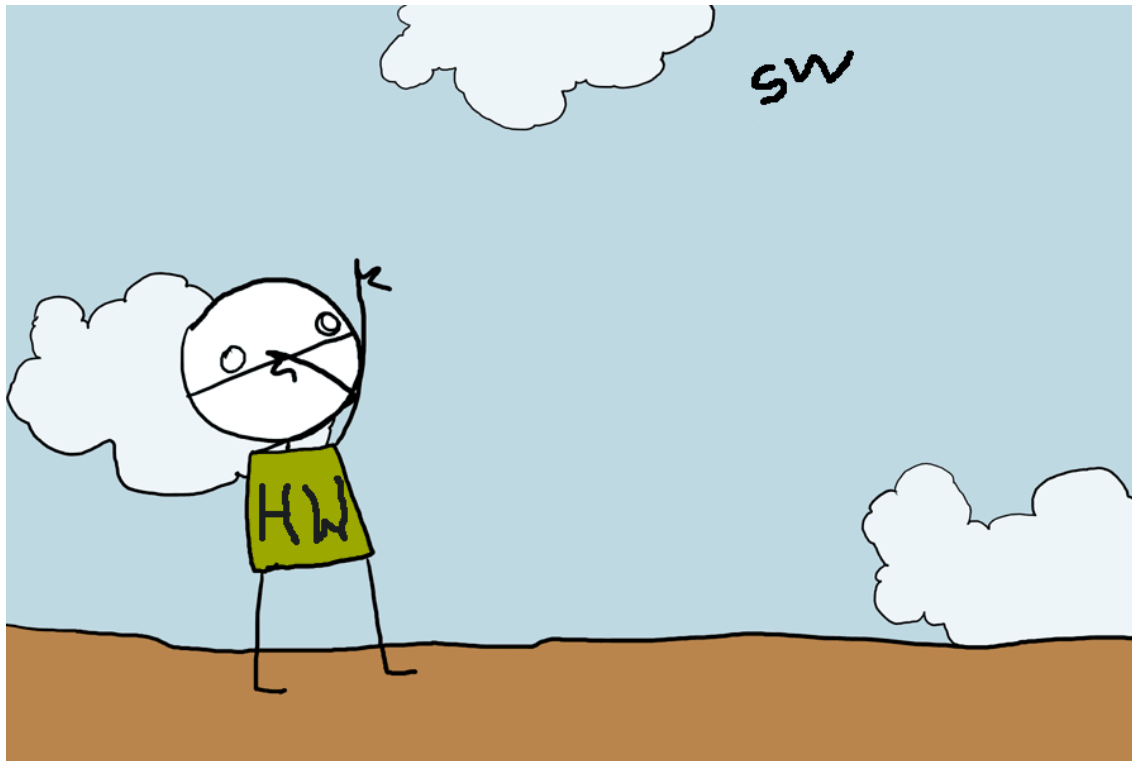
- In closed and proprietary systems such a strong link makes it difficult and expensive any further evolution.





# History teaches...

- The world of PCs had a strong speed up when hardware and software separated their paths to evolution





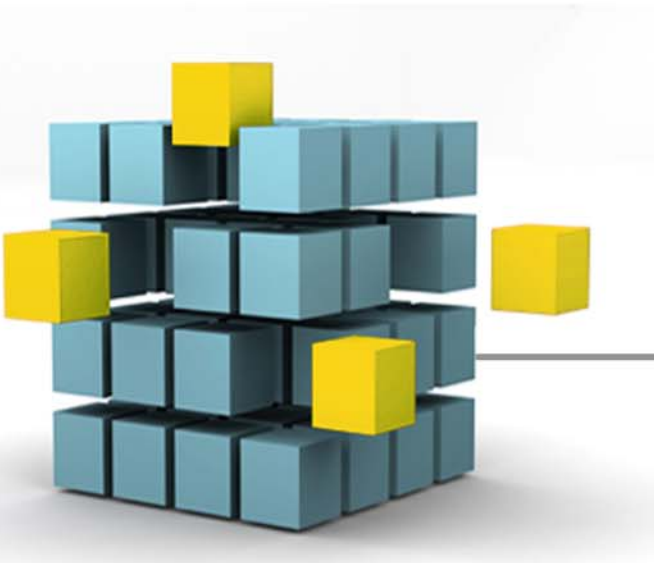


# Independency

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- software should achieve less dependency from devices
- and about hardware...

# Four points to guarantee flexibility to the systems





# Devices that are...

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open

an open architecture make it possible software development and updating even to subjects different from the manufacturer

---

easy to  
interface

interfacing with other devices, not necessarily from the same brand, is possible and not too much difficult

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# Devices that are...

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easy to  
introduce

i.e. that have a low entry level, both for the cost and for the effort, to permit a gradual introduction of new technologies

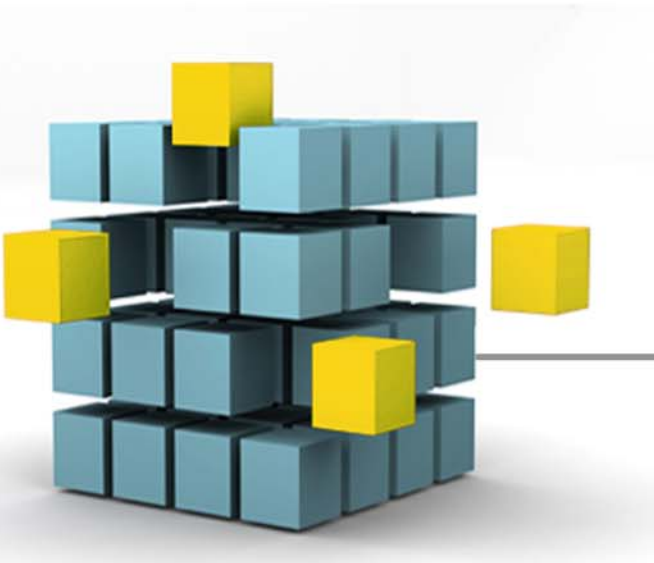
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upgradeable

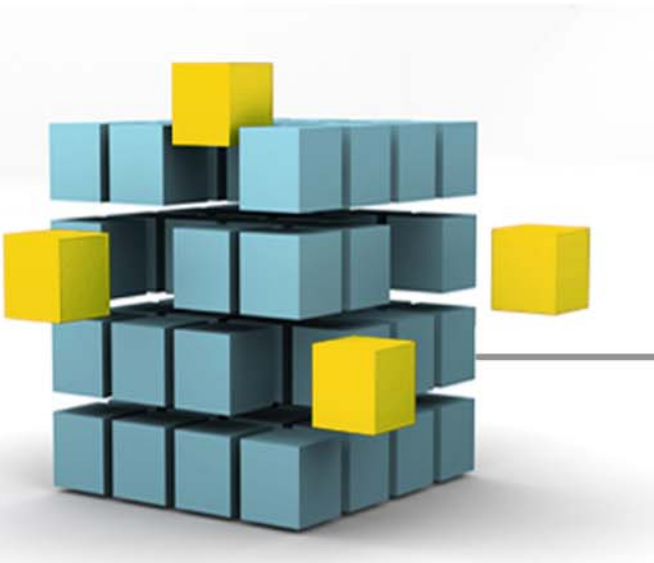
able to evolve, also at a later time, toward more advanced technology, thanks to a modular structure

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# What AEP is doing in this direction



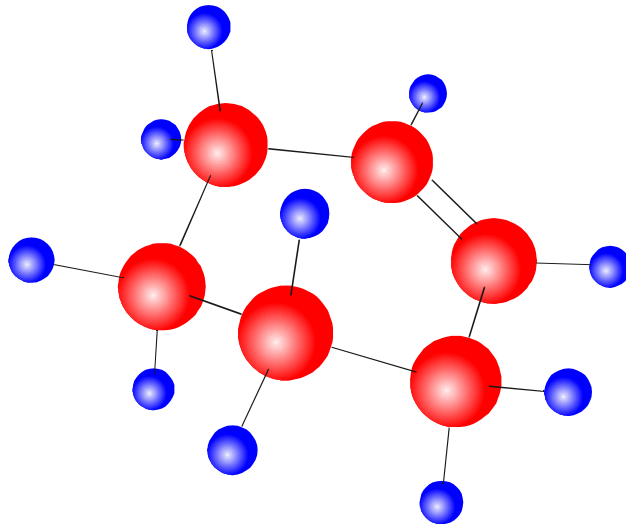
# First: opening





# Closed and proprietary systems

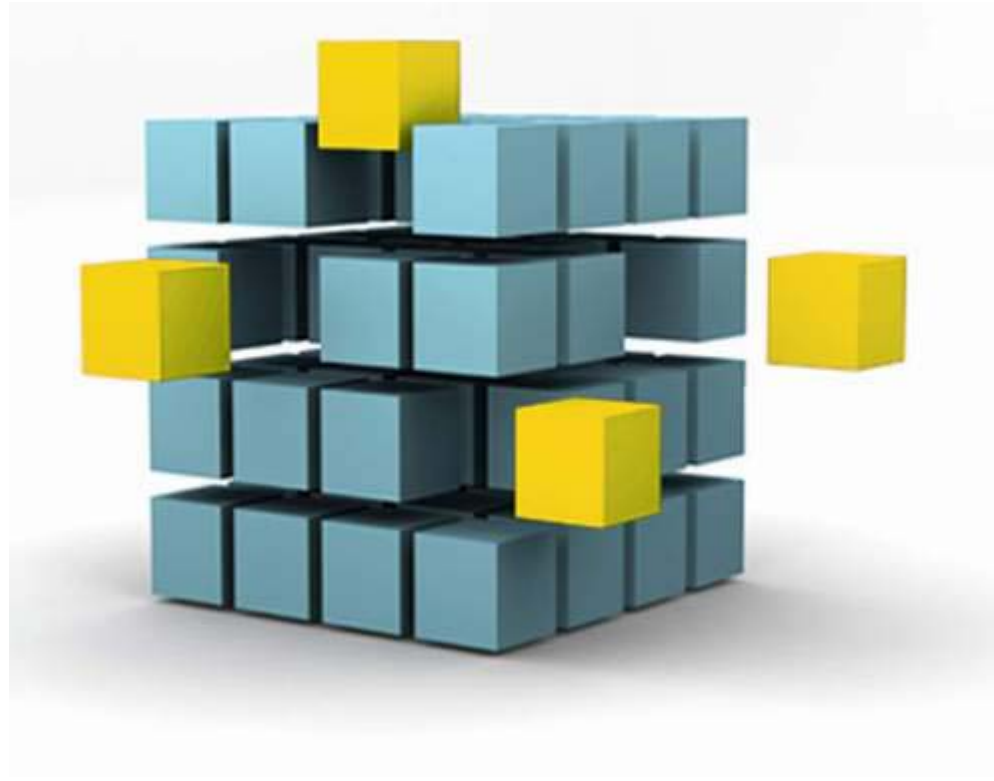
- As many directly experienced, in closed and proprietary systems the substitution of an element with another from a different source is often practically impossible





# A solution for opening

- AEP studied a possible solution to help the interchangeability of devices







# That is...

- the definition of an **abstract layer** that offers freedom to system software and future upgradeability to users
- a **configuration language**, called **VCL** (*Validator Configuration Language*), to define devices behaviour in an hardware independent way



Supervision and  
management center



VCL DEFINITIONS



Operational periphery



- Software capable to produce VCL definitions can operate, with minimal modifications, with any VCL device
- different VCL devices can operate together with any VCL capable system software

TRIPS 0 // Maximum number of  
PROC 0x100 // Processes  
DUR 0  
MU 0  
XBD 3 // maximum transfers



# VCL can, for example, define...

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- data maps and formats
- fare titles
- processing rules for fare titles
- transfer rules
- timeslot tables
- print rules for ticket validations
- zone and zone set tables
- data format for activity files
- operating parameters
- etc.



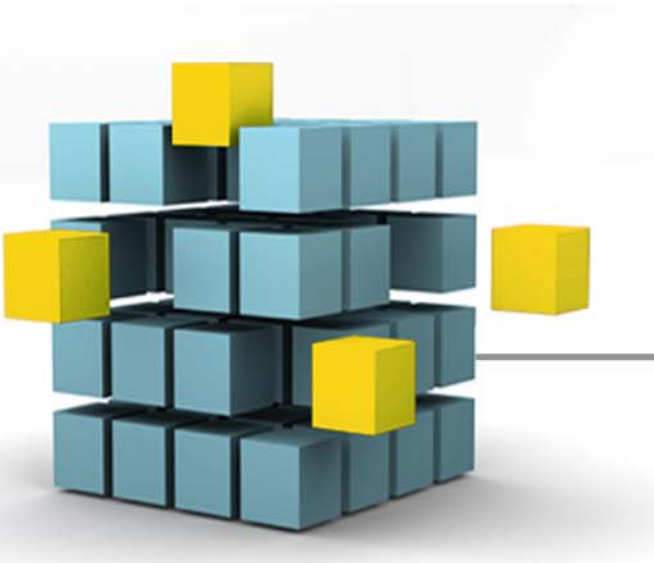
- VCL is standard on any AEP validator
- AEP proposal has been accepted and used by important system integrators



- **Application SDK** – C/C++ developer's kit with all the tools to develop custom applications



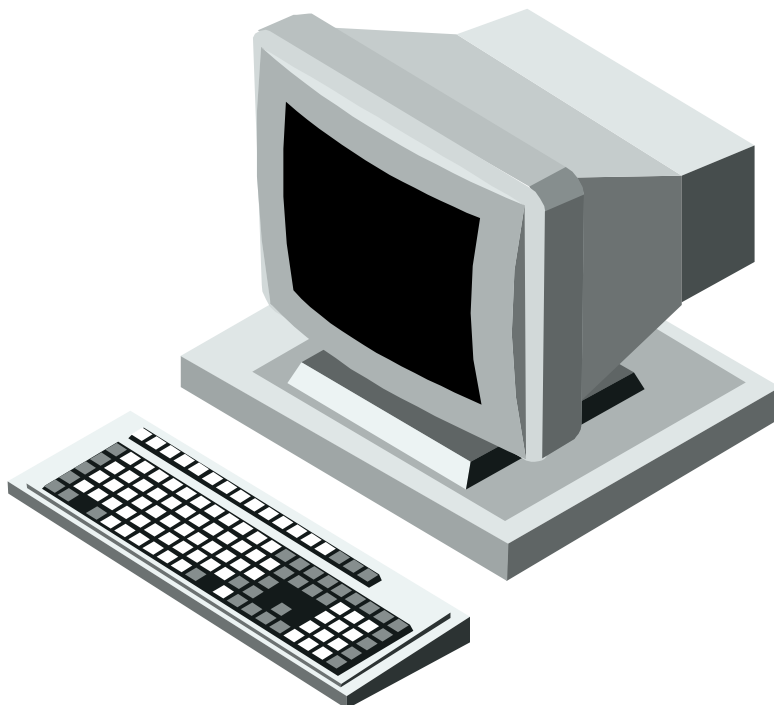
Second: easy to interface





# Hard to ...

- ... imagine a world where PCs can be interfaced only to devices from the same brand...







# Easy to interface

- **Interface kit** – to interface devices with others from different manufacturers

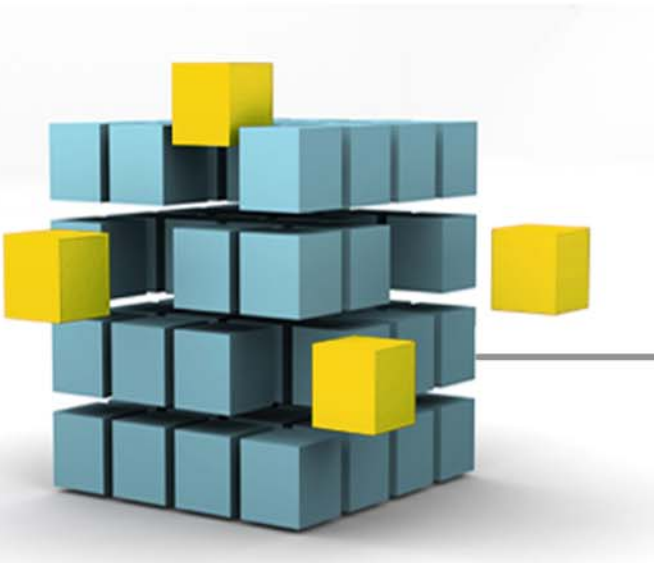




# Easy to interface

- ready to use libraries for:
  - Windows
  - Linux
  - Ingenico
  - SAGEM
  - Mxm
  - DOS
- more than ten important Italian system integrator use AEP developing tools and interface kits

Third: easy to introduce





# Easy to introduce

- devices that are able to **cover today needs** and that can be **softly upgraded** to a wide range of tomorrow requirements avoid discontinuity and reduce costs
- e.g. an upgradeable puncher with functions and costs comparable to old electromechanical devices. That, when needed, can become an intelligent validator without substitution.
- e.g. a smart card validator with puncher functions can optimally manage the transition from the paper ticket to smart cards

# Example: AEP F240 validator

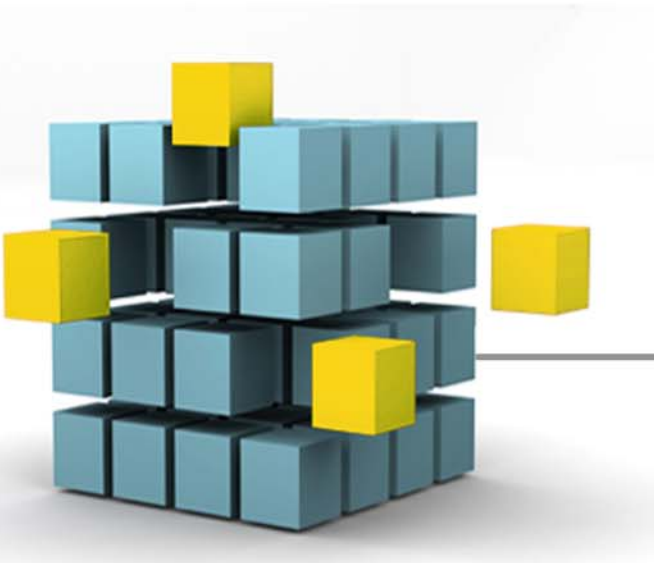






Example: AEP ATVM  
from TVM, to s.c. validator, and more

# Fourth: upgradeability





# Upgradeability

- devices that can be modified to follow customer's requirements.
- An existing example in Florence. About 1,000 ATAF devices were born as validators for contact Viapass smart cards (from soc. Autostrade) and paper tickets; then they were modified to get a SAM module for processing MiniPAY (TSP/SSB) electronic purse; today they use contactless ISO 14443B smart cards.



more than 10 years working  
3 major updates

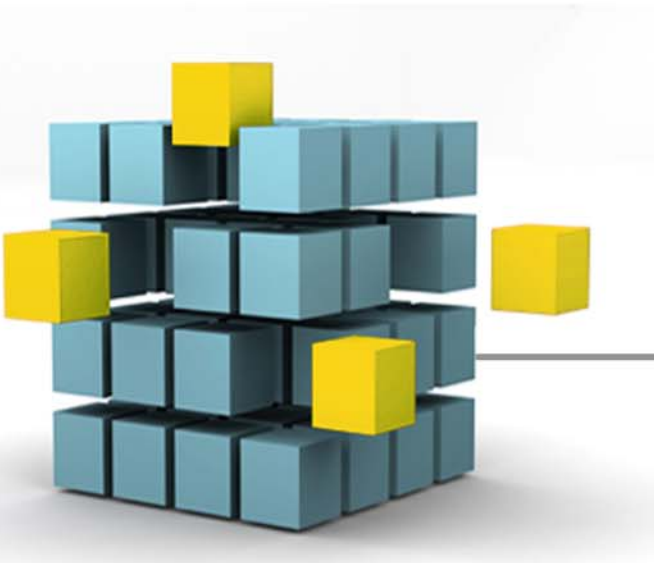
*Agile*

la carta contactless  
per la città di Firenze



**ATAF**

... with attention to new  
technologies





# Evolutions from the banks world



- MiniPAY contactless
- Easycard
- Volocard
- EMV contactless
- EMV + applet Calypso
- POS validators





# Cellular phone payment



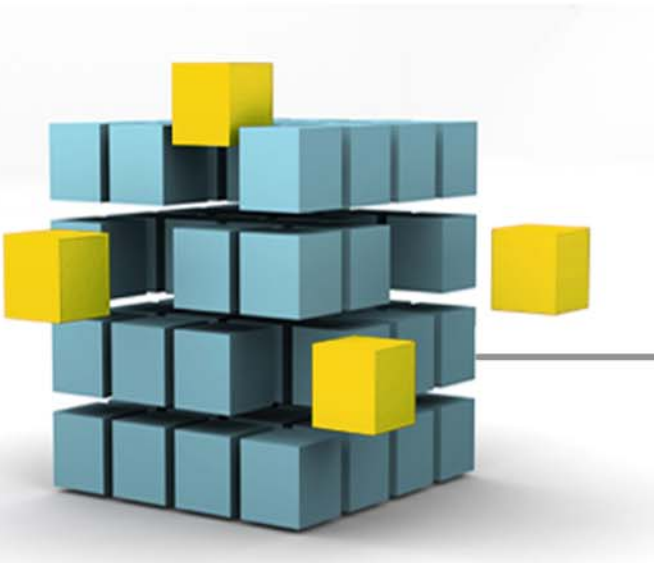
- Near Field Communication (NFC)
- Other solutions seem not to be granted by the market



# Resuming, AEP proposal is...

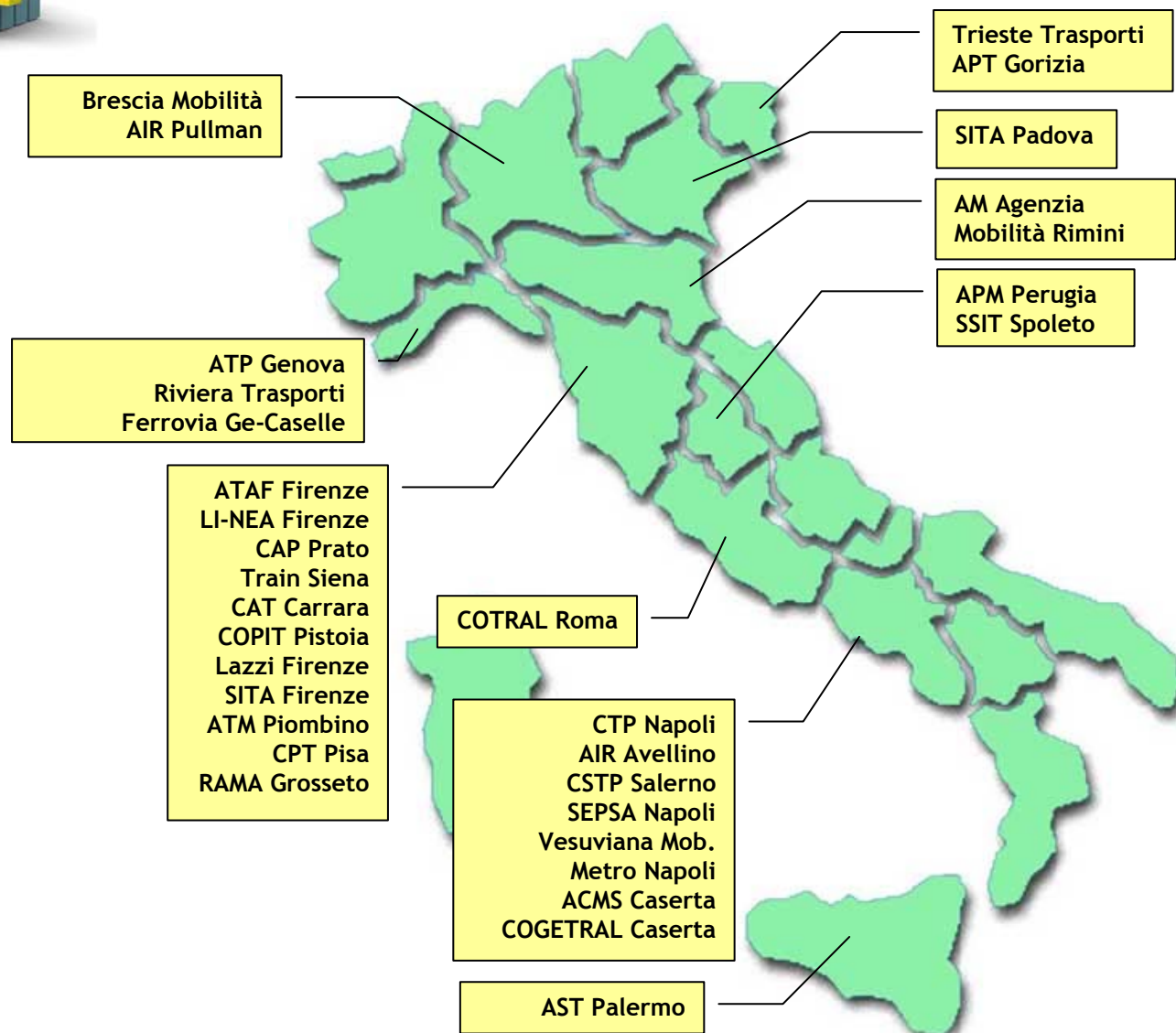
- **open architecture**, to guarantee that devices can follow the evolutions of the system with limited bounds to the supplier
- **easiness in interfacing**, to mix devices from different manufacturers in the same system when needed
- **easiness in introducing**, not being an obstacle for existing reality and for easy startup processes
- **upgradeability**, to add functions even at a later time and to follow future users needs

AEP proposal gets assent...





# Wide market acceptance





# AEP important partners



- Elsag
- TSF
- Siemens Italdata
- IPM Group
- T & T
- Mediamobile
- TAG
- Delta Sistemi
- CAP Research
- Italsime
- ecc.





# OEM agreements



- AEP signed a cooperation agreement with Olivetti for the OEM supply of magnetic and contactless validators (V@lida 300 e V@lida 500)
- A first system is already under installation in a foreign city



# OEM products

# TSF

VIOLA  
Validatrici elettroniche  
per impieghi  
ferroviari e veicolari



Thanks for your attention  
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