

## **RICCARDO CARRARO**

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**CMDBuild for the management of inventory,  
monitoring and inspections of  
motorway infrastructure assets**



# Outline

1. Our company
2. Main use areas
  1. IT and Road assets inventory
  2. Ministerial reports (AINOP)
  3. Road assets geolocation
  4. Periodical inspection plans
  5. Portal for ticketing
3. External systems' integration (connectors)
4. BIM projects management
5. Conclusions



# Our company

- Founded in 2008
  - Motorway company
  - 220+ employees



- Ensure users' safety on the infrastructures under management
  - Perform periodic inspections over the main artworks
  - Keep trace of over hundreds of thousands of assets
  - Maintain high levels of conservation and maintenance of the artworks



# Company needs

- Have an organized land registry of everything the company manages
- Being able to organize:
  - Inspection and maintenance plans for the work
  - Preventive and corrective interventions
- Being able to historicize the information and be able to easily use it for reporting and ministerial obligations.



# IT and Road Asset inventory

- Detailed catalog
  - Road assets
    - Artworks/Structures,
    - Artworks/Structures single components (slabs, spans, beams, ...)
    - Systems (traffic control, electrical, network, ...)
    - Elements (punctual, linear)
  - IT assets
    - Desktop, Notebook
    - Client peripheral
    - Infrastructure assets (physical and virtual servers, clusters, switch, ...)

The screenshot shows the CAV SpA software interface. On the left is a navigation tree with 'Bridge' selected. On the right is a table of bridge assets.

Structure name	Asset ID	Road section
Ponte su Fiume M...	102	A4 Passante di Mestre
Ponte su Fiume D...	112	A4 Passante di Mestre
Ponte su Fiume Br...	11	A4 Padova-Dolo
Ponte su Fiume D...	124	A4 Passante di Mestre
Ponte su Fiume D...	131	A4 Passante di Mestre
Ponte su Fiume Z...	144	A4 Passante di Mestre
Ponte su Rio Fium...	19	A4 Padova-Dolo
Ponte su Scolo Vol...	210	A57 Tangenziale di Mestre (
Ponte su Canale T...	229	A57 Tangenziale di Mestre (
Ponte su Scolo Ze...	231	A57 Tangenziale di Mestre (
Ponte su Scolo Lu...	233	A57 Tangenziale di Mestre (
Ponte su Fiume Te...	24	A4 Padova-Dolo
Ponte su Canale C...	250	A57 Tangenziale di Mestre (
Ponte su Fiume M...	270	A57 Tangenziale di Mestre (
Ponte su Collettor...	281	Raccordo Marco Polo
Ponte su Collettor...	282	Raccordo Marco Polo
Ponte su Canalet...	286	Raccordo Marco Polo
Ponte su Fiume D...	288	Raccordo Marco Polo
Ponte su Collettor...	289	Raccordo Marco Polo
Ponte su Scolo Pla...	307	Raccordo Marco Polo
Ponte su Scolo Pla...	312	Raccordo Marco Polo





# Road asset geolocation

- Map location (GIS):
  - Structures location
  - Multiple layers (Bridge, Viaduct, ...)
  - ...

The screenshot shows a web-based GIS application titled 'Cards Structure' for 'CAV SpA'. The main area is a map of the Venetian region, showing a network of roads with various colored markers (green, orange, blue, purple) representing different road structures. The map includes labels for cities like Treviso, Venezia, and Padova, and roads like the A4. On the right side, there is a 'Cards Menu' and a 'Geo Attributes' panel. The 'Geo Attributes' panel shows 'Position (Underpass)' and 'General Data' for a selected structure.

General Data	
Structure name	Asset ID
Sottopasso Via Cimitero	133
Name	Use contact person
Sottopasso Via Cimitero	
Designer	Works supervisor
Ing. Massimo Raccosta	Ergotema Servizi Integrati di Ingegneria
Builder contractor	Commissioning cert. year
Alissa Costruzioni Spa	anno 2008
Carriageway extension date	Viaduct code
	-
IOP Code	Infrastructure type
STAU0004PN78LG6QAK	Autostrada
Road section	Structure type
A4 Passante di Mestre	Sottopasso
Identifier	Construction works start date
CAV_133	
Construction works end date	Commissioning date
Entry into operation	Initial milestone
anno 1900	389+650
Final milestone	Length
	6
State	Category
Operazione pienamente agibile	
Operation year	Planning year



# Periodical inspection plans

- Plan management:
  - Modify a single inspection instance
  - Manually start a specific intervention
  - Re-plan inspections
  - Automatic alarm (email)  $n$  days before start date
- Inspection filling
  - Customized page to easily compile the checklist
  - Outcomes pre-set with the last completed inspection
  - Easy to define and extend the checklist
  - Automatic TSR (structure condition index) calculation
  - Upload photos to single defect measure (check)
  - Mobile ready

The screenshot shows a mobile application interface for a inspection plan titled "Campata 1". The interface is organized into sections for different components:

- Apparecchi d'appoggio (4)**: Includes items like "Deformazioni apparecchio/rigonfiamento gomma/mal posizionamento" (SI), "Formazione di ruggine nell'acciaio" (NO), "Presenza di detriti/ramaglie" (SI), and "Ristagno di acqua" (NO).
- Dispositivo antisismico (4)**: Includes "Presente" and "Ispezionabile" checkboxes.
- Giunto (5)**: Includes items like "Ammaloramento/rottura degli elementi costituenti" (NO), "Disallineamento longitudinale" (NO), "Dislivello giunto-pavimentazione" (NO), "Fessure adiacenti al giunto/sul massetto" (NO), and "Presenza di detriti/ramaglie" (NO).
- Guard rail (3)**: Includes "Presente" and "Ispezionabile" checkboxes.
- Muro andatore C.A. (7)**: Includes items like "Danni da urto/possibile deformazione armatura" (0% to >75%), "Distacco copriferro/fenomeni di spalling" (0% to >75%), and "Fessure diagonali/trasversali" (0% to >75%).





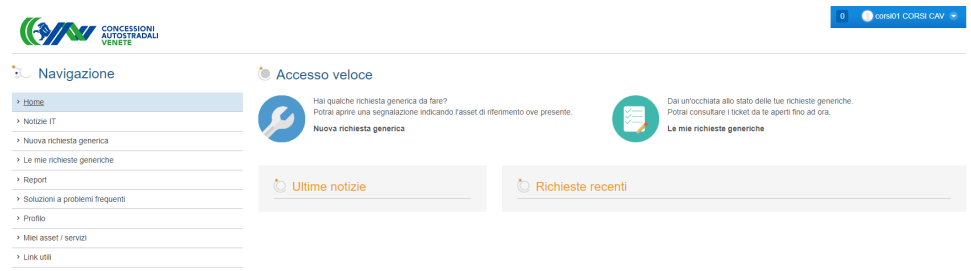
# External systems' integration

- CMDBuild collects data from multiple sources.
- Connector's updates data automatically:
  - vSphere (VMWare) – Physical and virtual servers
  - Samsung Knox – Smartphones and wearables
  - Active Directory – Employees data
- Other integrations:
  - SAP – Contracts



# Portal for ticketing

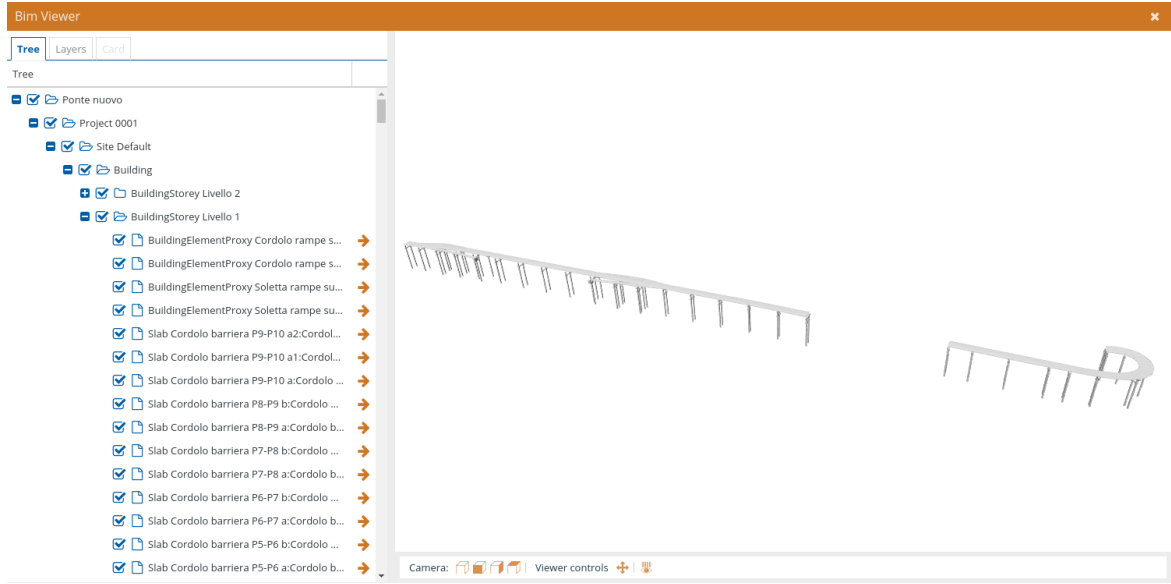
- All employees can open a ticket easily from the portal
- No need to be registered neither to be aware of CMDBuild existence.
- Active Directory authentication





# BIM projects management

- Easy IFC files import and link some or all object to real CMDBuild cards
- Handle multiple IFCs for a single card/structure





# Conclusions

- Company activities management centralization
  - Adopting an incremental approach
- Procedures improvement and speed up
  - Checked and steered via processes
- Instantaneous information availability
  - Automatically calculated
  - Updated in real time
  - Aggregated according to the desired criteria



28 October 2020  
#cmdbuildday2020

Virtual Conference



# Thank you