



FSR 11th Florence Rail Forum - Digital Single European Railway Area

What has been already achieved in terms of digitalization of the railway sector? Examples of digital solutions

Florence, 27 November 2015

Digitalisation and system interoperability

Customer



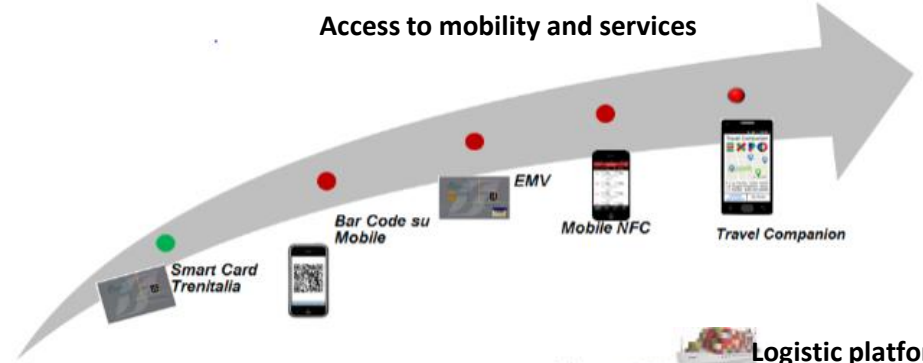
Digital instruments



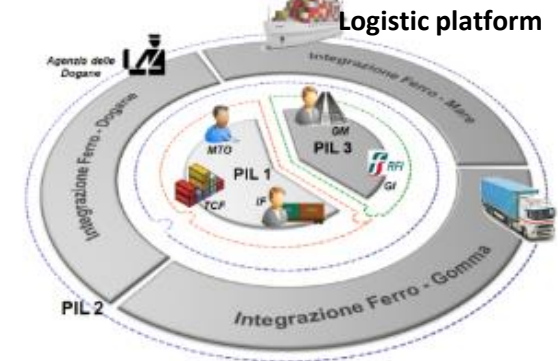
Infrastructure networks



Access to mobility and services



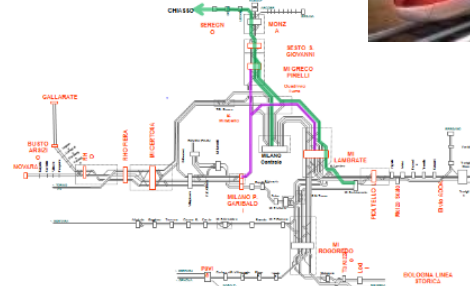
Intermodal integration



Smart trains



Network technologies



Network interoperability

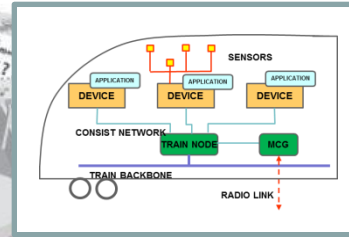


Railway Digitalisation: integrated approach

Train documents digitalisation



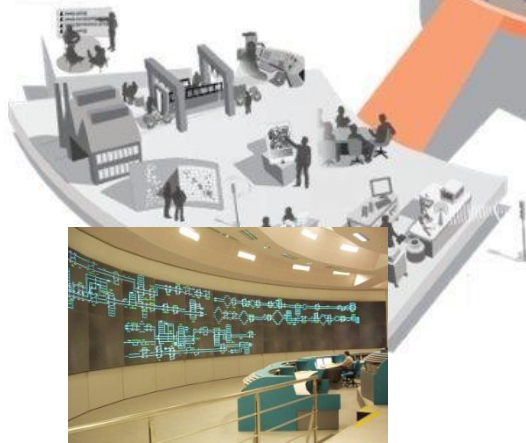
Command & control systems



Innovative rolling stock



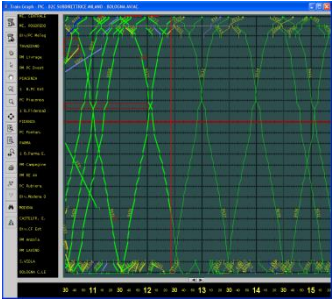
Diagnostic trains



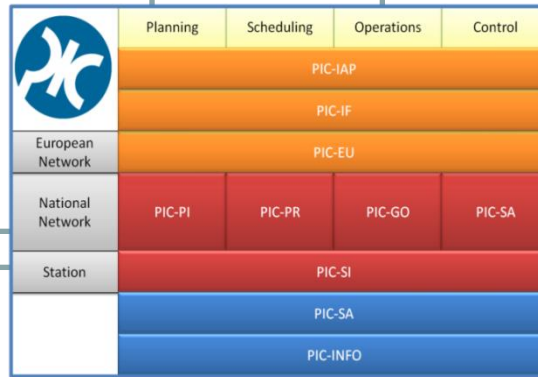
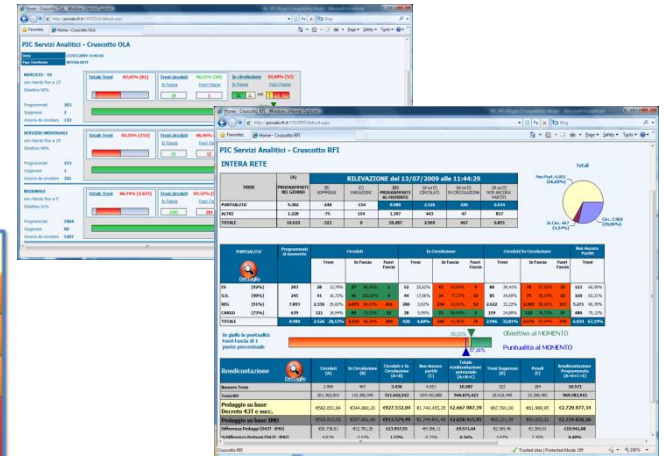
PIC (Piattaforma Integrata Circolazione)

Integrated traffic management platform

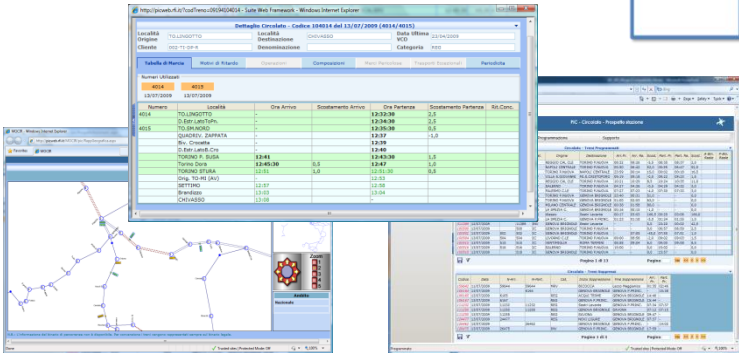
Operation management



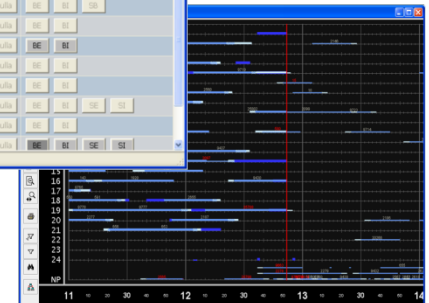
Analysis, monitoring, reporting



Info

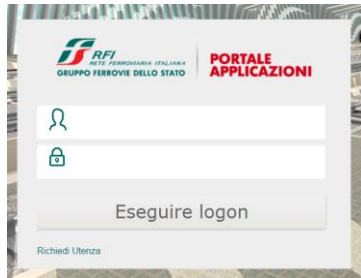


Station service



On-line information systems

Rus info: PIC WEB & PIR WEB on-line network statement



- ✓ TAC
- ✓ Traction System
- ✓ Max axle weight
- ✓ Control-command system
- ✓ GSM-R availability
- ✓ Lines out of commercial service
- ✓ Freight terminals
- ✓ Passenger station
- ✓ Available services
- ✓ Etc.



Passenger info: on-line train station time-table (PRM compliant)



Stazione: BOLOGNA CENTRALE
ultimo aggiornamento: 24/11/2015 17:19:16

treno	provenienza	orario	ritardo	informazioni	binario
AV 9576	SALERNO	17:20		NESS IN CODA	17
AV 11572	BAZZANO	17:20			1 OVEST
AV 9022	ANCONA	17:21			
AV 9640	NAPOLI C.LE	17:25		NUOVO FRECCIAROSE	16
AV 9243	MILANO GLE	17:27		NUOVO FRECCIAROSE	16
AV 11545	PIACENZA	17:28			
AV 9221	ROTTOMAGGIO	17:31			4 EST
AV 9358	FORRETTA	17:32			3 OVEST
AV 11179	FERRARA	17:34			10
AV 9540	NAPOLI C.LE	17:35		NESS IN TESTA	17
AV 9393	MILANO GLE	17:37			1
AV 2241	VENEZIA S.L.	17:40			PR1
AV 9481	BOZZANO	17:40			PR
AV 11459	VIGONZA	17:40			1 OVEST
AV 11638	PRATO G.LE	17:49			1 EST
AV 9443	VENEZIA S.L.	17:50			PR1
AV 9537	DIODIO	17:51			3 EST
AV 2261	BRENNERO	17:54			1
AV 11650	MAVENNA	17:54			1
AV 9445	VENEZIA S.L.	18:00			PR1
AV 0938	SALERNO	18:00	5'	A	17
AV 11642	MACASOTTO	18:02			6 OVEST
AV 9435	FIUMICINO A.	18:07	10'		PR1
AV 2281	MILANO C.LE	18:08			3 OVEST
AV 9413	ROMA EUR	18:12	10'		PR1
AV 9335	S.PIETRO C.	18:13			7
AV 9624	LECCE	18:14			6
AV 9549	MILANO C.LE	18:17		NESS IN CODA	16
AV 9433	POGGIO RUSCO	18:18			2 OVEST
AV 11409	PIACENZA	18:18			4 OVEST

ATTENZIONI! E' SEVERAMENTE VIETATO OI TRAPASSARE I A I INFA GIALI A F SALIRE C

RFI - Diagnostic Trains

Archimede

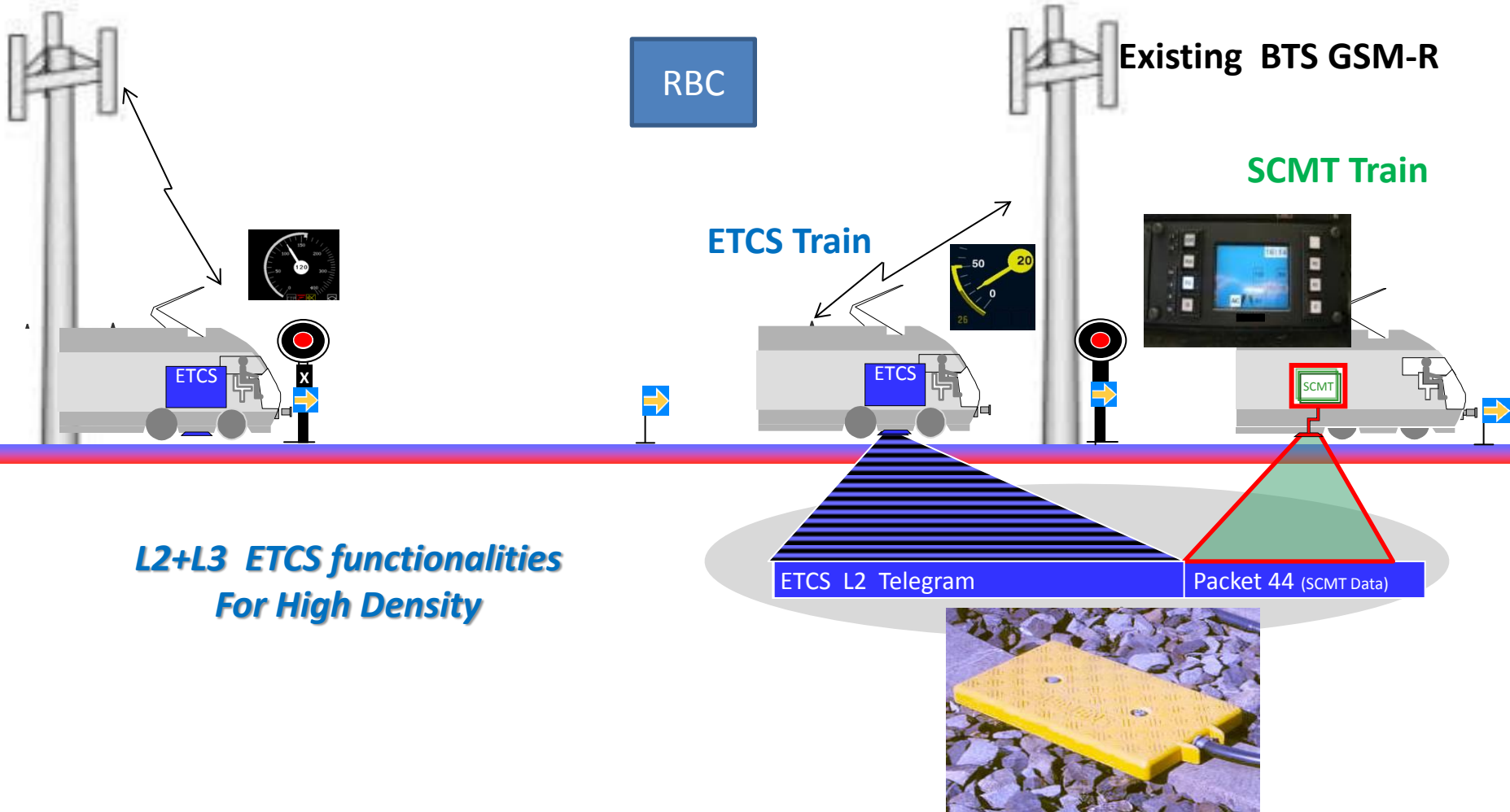


Diamante



ERTMS/ETCS L2 overlapped at (Class B) SCMT

For CNCs and High Density (HD) in Urban Nodes



**L2+L3 ETCS functionalities
For High Density**

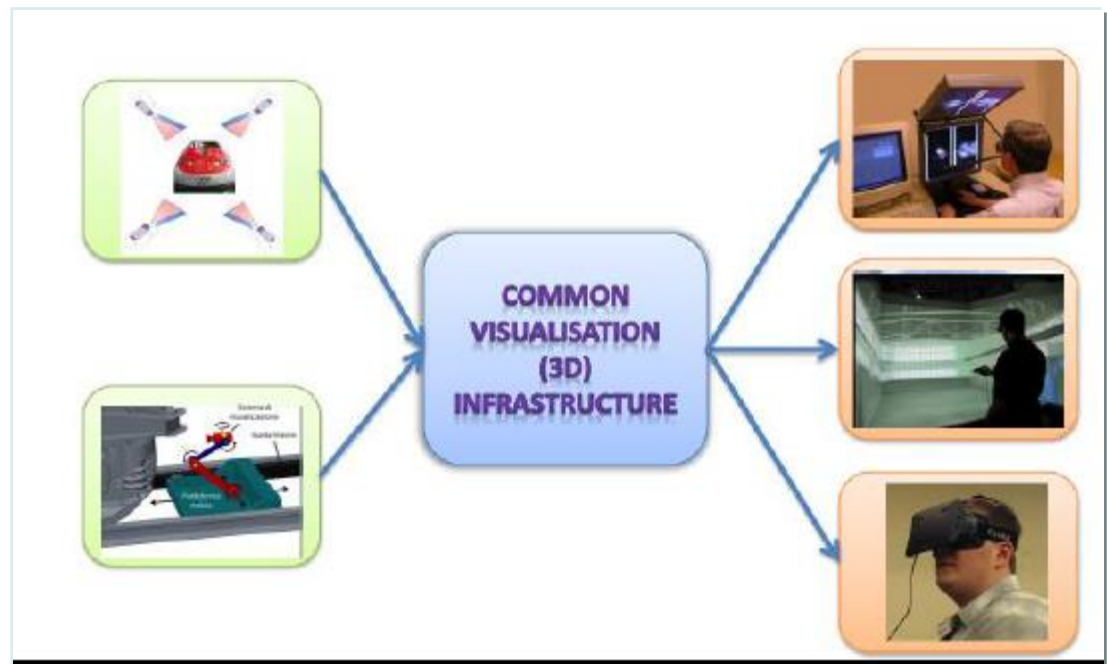
Existing Class B (SCMT) Eurobalises and Encoder

Dynamic Maintenance Management System (DMMS)



- ✓ On-board diagnostic
- ✓ Interoperable with maintenance planning
- ✓ Dynamic maintenance planning

- ✓ Smart testing devices
- ✓ Big Data
- ✓ Internet of Things
- ✓ Remote control
- ✓ Cost reduction

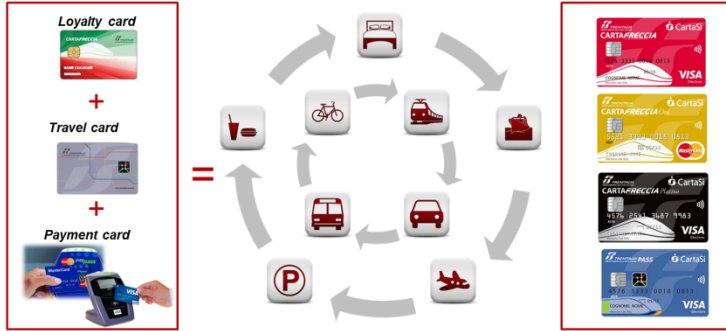


Ticketing digitalisation

Benefits for customers and company innovation

Smart card

One card for the whole travel experience



On-line ticketing



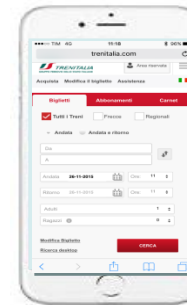
On-line train traffic information



Integrated sale system

App: ticketing, info, travel companion

Mobile ticketing



Digitalisation of train documentation



Single platform on tablet for train drivers and conductors

Digitalisation of:

- ✓ regulatory documents
- ✓ technical documents
- ✓ formative documents
- ✓ technical movement documentations

Benefits for environment, cost reduction, paper load and communication improvement

Shift to Rail



IP 4 IT Solutions for Attractive Railway Services

- ✓ Real time re-adaptation addressing multimodal travel
- ✓ To interoperate railway across “smart” region and city environment
- ✓ Multimodal ticketing
- ✓ Travel companion
- ✓ Travel shopping
- ✓ Payment system

Open points

- ✓ Mobile broadband to cover the whole Core-Network (Railway, Road, Ports, Airports). PSO?
- ✓ Cyber security (NISD)
- ✓ Big data
- ✓ Access policy
- ✓ Consumer protection
- ✓ Privacy protection
- ✓ Safety