IEC INTERNATIONAL

DIGITAL TOOLS

TO SUPPORT BORDER CROSSING AND SMOOTH OPERATIONS

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UIC RAME WEBINAR

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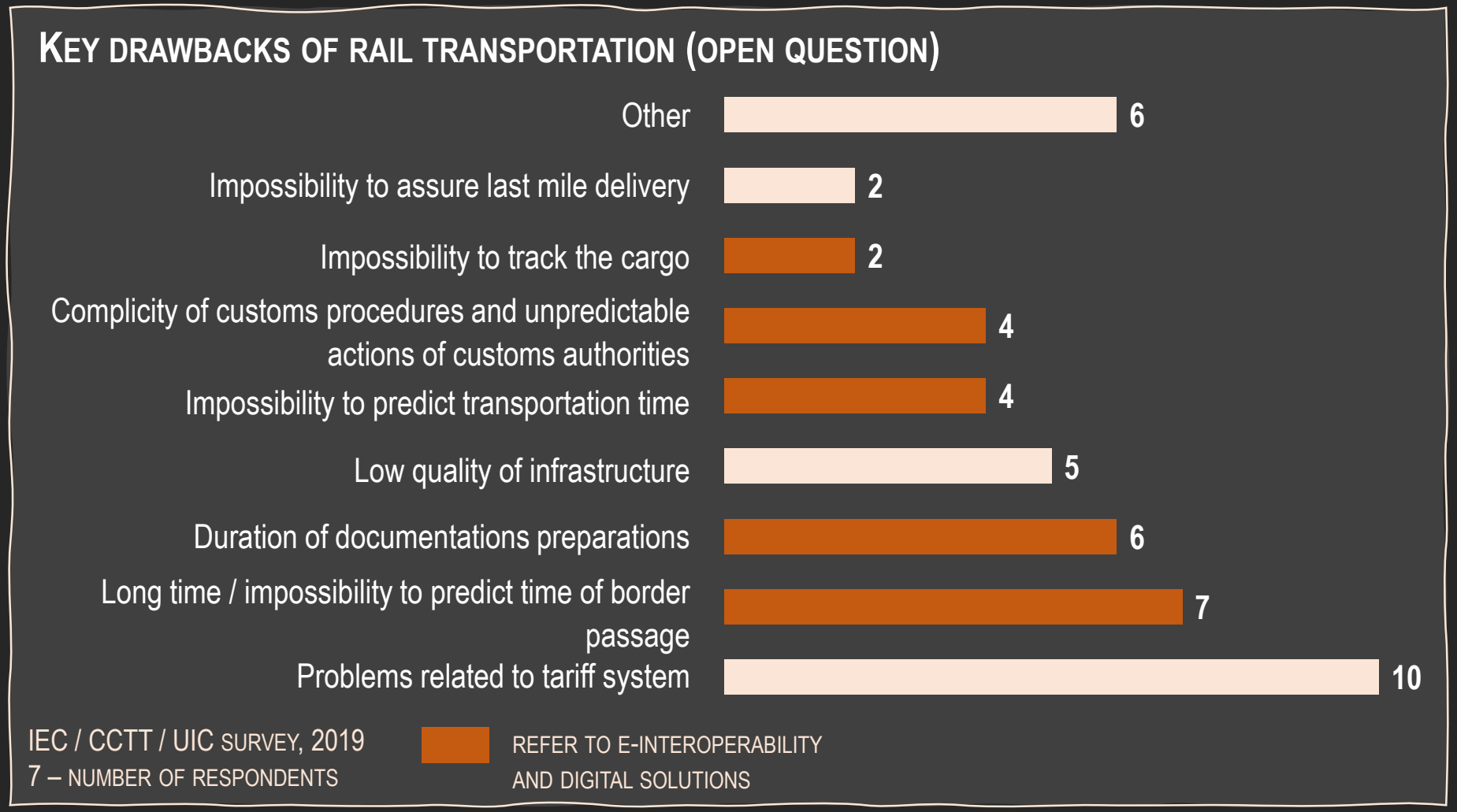
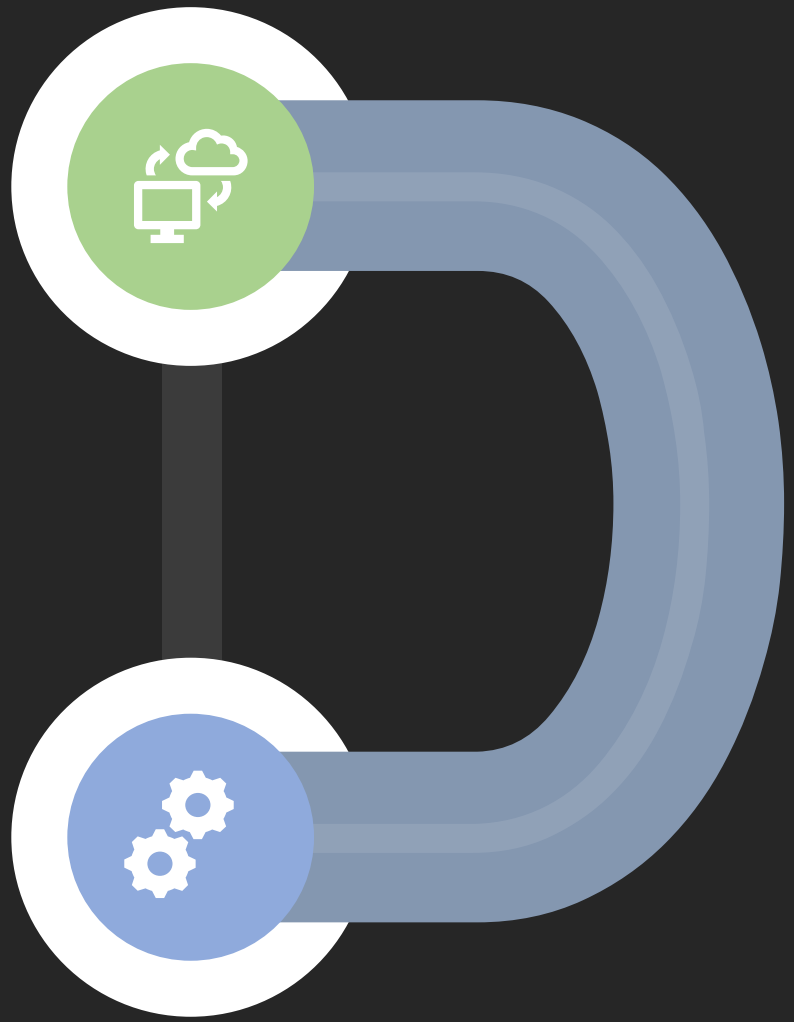
1. The role of digital solutions

Focus on digital tools, e-interoperability is a trend originating from growth of container transportation by rail.

Transportation of containers is sensitive to both time and cost, and electronic data interchange, as well as internal digital solutions, may result in reducing both costs and time of shipment.



2. What are digital solutions?



01

Internal solutions

Digital tools applied within railway company, usually aimed at:

- automation;
- decrease of human factor impact;
- use of dagta-driven analytics.

02

Integrative solutions

Digital tools applied within between different railways or with third parties aimed at:

- pre-informing and interchange of information;
- acceleration of procedures
- time economy.

3. Role of digital and data-driven solutions. Smart solutions chart*

Traffic operations

Automation of terminals
Automated traffic management systems
Estimated time of arrival
Interoperability
E-interoperability

Border crossing

Bogies change at one side
Combined (joint) control procedures
E-data interchange between railways and border agencies
E-seals with customs information
Non-intrusive inspections
Non-stop border crossing
Standard time targets
Simultaneous scheduled transshipment
Use of combined rail consignment as customs documents

Intermodality and customer relations

Electronic sales
Single window
Tracking applications

Maintenance, safety, security

Predictive maintenance
On the go data on cargo state (containers)
Drones
Energy-efficient LED systems
Energy recuperation and resource reuse

Rolling stock

Automation of train driving
Fuel cells and hydrogen trains
Battery trains
Hybrid trains

Multi-use tools and technologies

- Data integration
- AI and machine learning
- Blockchain
- Digital ecosystems
- Smart sensors
- Satellite data

Decision-making tools

- GIS
- Transportation modeling

Applicability

- National
- International
- International and national

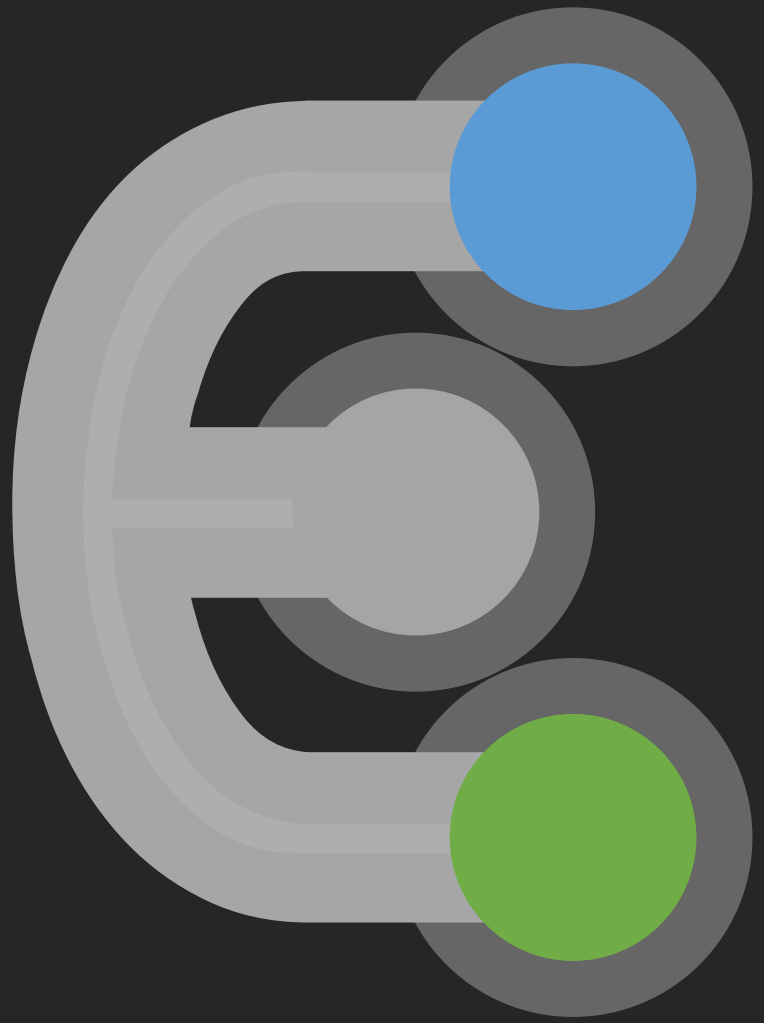
Type of solutions

- Technological
- Institutional
- Mixed

* UNESCAP – OSJD Virtual meeting, April 2020

- Recommended for use during COVID-19 pandemic and at recovery phase
- Solutions aimed at environmental sustainability

4. KEY PRINCIPLE OF E-INTEROPERABILITY: FROM DOCUMENTS TO DATA INTERCHANGE



Documents to data

E-interoperability supposes both data and e-documents interchange, but key idea is to shift from documents (both paper and electronic) to data.

Data integration

E-interoperability supposes data integration to form credible digital ecosystem, that allows switching many processes to digital (including contract performance, payments, etc.)

Data interchange principles

E-interoperability does not necessarily suppose changing local systems. It is focused on creating Application Programming Interfaces (APIs) to connect different systems based on uniform protocols for data interchange.

5. From international corridors to digital ecosystems

Digital ecosystem is based not on paper documents flows, but on e-data flows only, where data are accessible for all participants, but are verified and cannot be changed without consequences.

all participants can be informed on the freight flows in advance and during transportation process

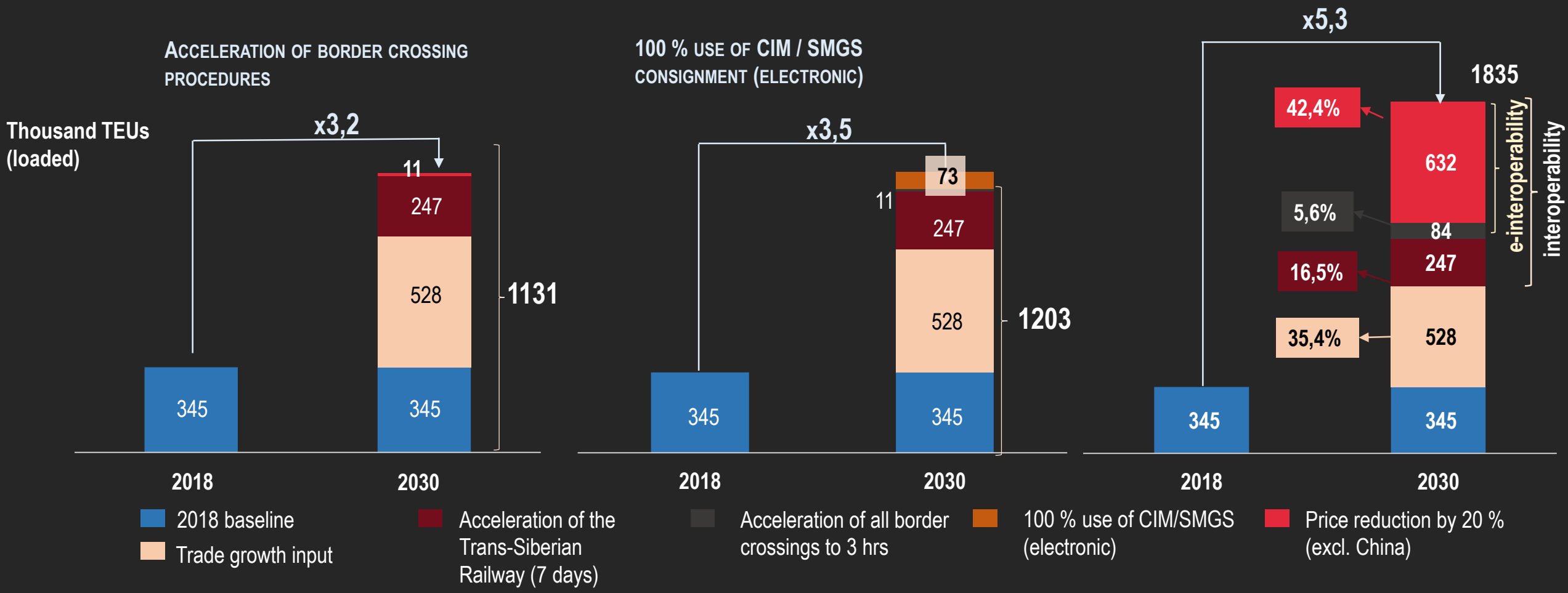
use of e-data instead of paper documents or scanned documents (=>no need to unify documentary forms = no need to have separate customs and transportation documents)

accessible verified information which would be enough to assure faster payments between the participants of transportation process

easier integration for different countries, as no language problem is applicable for data

6. Measuring the e-interoperability

Cases from UIC study Eurasian corridors: development potential



7. CHOICE OF DIGITAL TOOLS AND DIGITAL TRANSFORMATION OF RAILWAYS

Repeating the experience of largest railway companies with complicated digital systems is not compulsory.

01 The first and compulsory step is an **audit** of internal and external elements of rail digital systems and the state of there integration.

02 Definition of key priorities for digitalization and / or integration (for external links) based on (1) modelling of economic and operational impact and (2) assessment of external context.

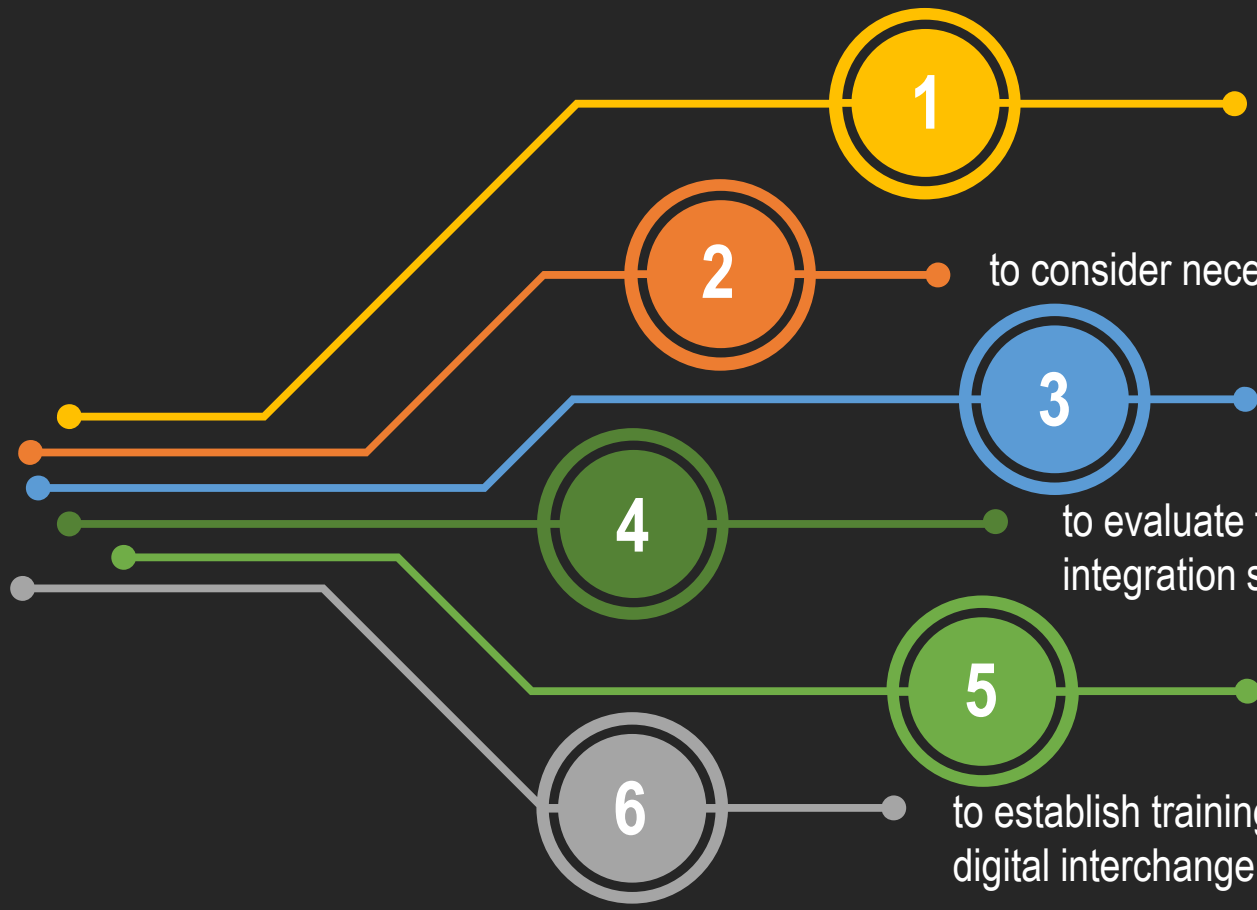
03 Elaboration of architecture: business processes and IT – one does not work without another one. Necessary internal projects are born at this stage.

04 Elaboration of integration architecture: internal and / or external.

05 Link to necessary documentary (or legal) framework.

8. INTERNATIONAL ACTIVITIES.

What can be done in international collaboration (e.g. by a dedicated digital freight consortium, with participation of UIC).



1. to propose practical and simply applicable documents and guidelines by types of rail business
2. to consider necessary IRS and to develop them from practical experience
3. to support further harmonization of legal framework
4. to evaluate the economic impact of different (a) digital solutions; (b) inter-system integration solutions; (c) use of specific technologies
5. to propose new financing tools for implementation of digital solutions
6. to establish training courses on rail digital transformation and digital interchange

THANK YOU FOR ATTENTION!

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