



D2.4

Performance & interoperability specifications

- M17 – Roles and responsibilities regarding evaluation and interoperability**
- M18 – Performance and evaluation criteria determination**

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LIST OF ABBREVIATIONS

A	Activity
AEOLIX	Architecture for European Logistics Information exchange
API	Application Program Interface
BRUcargo	Brussels cargo
CCS	Cargo Community System
CEPS	Centre for European Policy Studies
CERTH/HIT	Centre for Research and Technology – Hellas/Hellenic Institute of Transport
DG MOVE	Directorate-General Mobility Transport, MOVE
DIH	Data Intelligence Hub
EIF	European Interoperability Framework
ERTICO	European Road Transport Telematics Implementation Coordination Organisation – Intelligent Transport Systems & Services Europe
FENIX	A European FEderated Network of Information eXchange in Logistics
HPCS	Hellenic Port Community System
HS	Harmonized System
ICCS	Institute of Communication and Computer Systems
ISA	Interoperability solutions for public administrations, businesses and citizens
K+N	Kuehne+Nagel
KPIs	Key Performance Indicators
LCA	Logistik Center Austria
MDLZ	Mondelez
OIA	OIA Global
P&G	Procter & Gamble
PA	Port Authority
PCS	Port Community System
PS	Pilot Site
PNAEAS	Port Network Authority of the Eastern Adriatic Sea
SEA	Società per azioni Esercizi Aeroportuali
SELIS	Shared European Logistics Intelligent Information Space

SMIP	Smart Multimodal Information Platform
SELIS	Shared European Logistics Intelligent Information Space
T&L	Transport and Logistics
TBD	To Be Determined
TEN-T	Trans-European Transport Network
TFA	Telematics Applications for Freight
TMS	Transport Management System
TOS	Terminal Operating System
TM2.0	Traffic Management 2.0 is focused on multimodality and logistics
UPHF	Université Polytechnique Hauts-de-France

1. INTRODUCTION

1.1 Purpose of the document

The deliverable D2.4 – “Performance & interoperability specifications” is part of FENIX Activity 2, which is titled “*Strategic dialogue, cross-corridors collaboration and pilot roll out preparation*”.

The main objective of this activity is to establish the evaluation criteria and the performance objectives on the basis of the requirements of the federated platforms and the KPIs on connector, as defined in the sub-activities 2.1, 2.2 and 2.3. The focus is to determine which data need to be collected during the operational phase of each Pilot Site.

In particular, the main targets of Sub-activity 2.4 “Performance & interoperability specifications” are:

- Define the roles and responsibilities regarding evaluation and interoperability for each PS.
- Define the framework for the evaluation of the performance at local level of the FENIX Federation.
- Determine the evaluation criteria at the interoperability levels.

Being part of the sub-activity 2.4, the deliverable D2.4 represents the input data for the Evaluation activity (Activity 5), with the main topic of “interoperability”.

Pilots should demonstrate the performance according to the validation framework and A5 afterwards will evaluate the degree of performances achieved by each Pilot Site.

In this document, Chapter 3 presents a section for each FENIX Pilot, describing the roles within regarding to the interoperability and evaluation frameworks. Chapter 4 reports the methodology framework and preliminary feedbacks from the Pilot Sites about the performance at the local level (platform level), and the evaluation criteria for the FENIX Federation.

It is important to underline that the activity defines only a methodology in order to identify the expected level of performance. In the activity 5 the defined framework will be used for the real evaluation, by each Pilot Site because the rollout phase is not started. This activity is strictly connected to sub-activity 2.3, because the previous KPIs defined in the D2.3, will be used for the measurement of performance (refer to chapter 4 of D2.3).

1.2 Contractual References

FENIX stands for “A European FEderated Network of Information eXchange in Logistics”. FENIX is an action 2018-EU-TM-0077-S under the Grant Agreement number INEA/CEF/TRAN/M2018/1793401 and the project duration is 36 months, effective from 01 April 2019 until 31 March 2022. It is a contract with the Innovation and Networks Executive Agency (INEA) under the powers delegated by the European Commission.

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2. EXECUTIVE SUMMARY

This document will present a detailed description of the Performance & interoperability specifications of the FENIX federation, by describing the roles regarding the Interoperability and the main evaluation criteria for each platform in the Pilot Sites for the next FENIX activities.

It is important that this deliverable takes place in collaboration with each Pilot Site, as they provide contributions following the model made available through the template.

The deliverable is composed of two thematic chapters: the first shows the organization for each Pilot Site regarding the roles for interoperability, while the second describes the framework for the evaluation of performance.

The involved FENIX Pilot Site in this sub-activity are:

- *Austria*, on Fürnitz Pilot Site (south Austria) the Baltic-Adriatic corridor;
- *Belgium*, Aircargo Pilot Site;
- *Belgium*, multimodal inland hub-Procter & Gamble-Mechelen-Willebroek Pilot Site;
- *France*, French Mediterranean – North Sea Pilot Site;
- *Germany*, Rhine-Alpine corridor;
- *Greece*, Greece Balkan-TEN-T network, Adriatic-Ionian corridor-Cyprus multimodal Pilot Site;
- *Italy*, Trieste Pilot Site: Mediterranean and Baltic-Adriatic and the Motorway of the Sea of South-East;
- *Italy*, Milan/Genova: the Italian Rhine Alpine Pilot Site – Dynamic Synchromodal Logistic Modules;
- *Netherlands* (Dutch Pilot Site, Smart Multimodal Operations Platform (SMIP));
- *Slovakia*, all TEN-T corridors and multimodal Pilot Site;
- *Spain*, the Spanish-Atlantic Corridor Pilot.

The main objective of this activity is to define the framework for the measurement of performance and to recommend a set of measures that will be used for the Activity 5.

This result is the input for Activity 5, in order to complete the Evaluation activity regarding the federated platforms and the FENIX federation, with focus to interoperability.

The proposed frameworks are the same for all Pilots, the first one deals with KPIs on connector at a local level (see ph. 4.2), while the second regards the performance at federation level and it is defined through the evaluation criteria (see ph. 4.3).

3. ROLES FOR INTEROPERABILITY AND EVALUATION IN EACH PILOT SITE

Each Pilot Site provided a list of their internal organization regarding the roles for evaluation activities and the roles for interoperability.

Each partner also provided a characterization regarding the roles category:

- *Data Provider*: it is the owner of the data and can provide it to other stakeholders.
- *Service Provider*: it offers a service to a Data Consumer, using a data provider as a source or its own data.
- *Data Consumer*: it consumes data/service coming from a data/service provider.
- *Other*: it includes all the remaining types.

The figures listed below by each pilot represent the relevant key roles for the Activity 5, as they will be the links between the data collector and data evaluator, in order to guarantee the quality of collected data and to reach a high level of evaluation activities.

Below there are reported the main roles for each PS.

3.1 PS AT - Fürnitz Pilot Site (South Austria) on the Baltic-Adriatic Corridor

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
LCA	Alexandra Spitaler	Alexandra Spitaler	other	yes, Alexandra Spitaler

Table 1: Austrian roles

3.2 PS BE1 - Belgium, Aircargo Pilot Site

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
Air Cargo Belgium	Jeroen Van Wijnsberge Davide Scatorchia	Jeroen Van Wijnsberge Davide Scatorchia	other	Jeroen Van Wijnsberge Davide Scatorchia

Table 2: Belgium Air Cargo roles

3.3 PS BE2 - Belgium, Multimodal Inland Hub-Procter & Gamble-Mechelen-Willebroek Pilot Site

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
P&G	Florian Deschacht	-	Data Consumer	x
P&G	Sergio Barbarino	-	Data Consumer	x
OIA Global	Jelte Tempelaars	David Pereira	Service provider	
Logit One	Frank Knoors	Bernard Van Hoorde	Service provider	

Table 3: Belgium P&G roles

3.4 PS FR - French Mediterranean – North Sea Pilot Site

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
UPHF			Service Provider	

Table 4: French roles

3.5 PS GE - Germany, Rhine-Alpine Corridor

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
T-System	Ralf Grigutsch (responsible)	Ralf Grigutsch (responsible)	Other	Peer Siegemund
PTV	Florian Krietsch (responsible)	Florian Krietsch (responsible)	Service provider	Florian Krietsch
TX Logistics	Sebastian Ruckes (responsible)	Sebastian Ruckes (responsible)	Other	Sebastian Ruckes

JdR	Albert Charrel Ernst (responsible)	Albert Charrel Ernst (responsible)	Service provider	Albert Charrel Ernst Remco Dijkman
TU Eindhoven	Remco Dijkman (responsible)	Remco Dijkman (responsible)	Implementation partner	x
Uniontrasporti	Luca Zanetta (responsible)	Luca Zanetta (responsible)	Other	x

Table 5: German roles

3.6 PS GR - Greece, Greece Balkan-Ten-T Network, Adriatic-Ionian Corridor-Cyprus Multimodal Pilot Site

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
CERTH	Dr. Georgia Ayfantopoulou, Responsible for Evaluation (overall)	Dr. Georgia Ayfantopoulou, Responsible for Interoperability (overall)	other	Dr. Georgia Ayfantopoulou
CERTH	Sofoklis Dais, Responsible for Evaluation (Yellow Pages Platform for freight transport along the corridor)	Thanasis Pachinis, Responsible for Interoperability (re Yellow Pages Platform for freight transport along the corridor)	service provider	Sofoklis Dais, Thanasis Pachinis
ICCS	Giannis Kanellopoulos, Responsible for Evaluation (re Hellenic Port	Giannis Kanellopoulos, Responsible for Interoperability (re Hellenic Port	other	Giannis Kanellopoulos

	Community System)	Community System)		
PCT	-	-	service provider	Michael Kotras
TREDIT	Thanos Giannopoulos, Responsible for Evaluation (Collaborative meta-services Platform)	Arrianos Gkikas, Responsible for Interoperability (Collaborative meta-services Platform)	service provider	Thanos Giannopoulos
PEARL	-	-	data provider	Euripides Sakellariou
K+N	-	-	data provider	DiMIMSris Papadopoulos
K+N	DiMIMSris Papadopoulos, Responsible for Evaluation (re Corridor intermodal operations and logistics management platform)	DiMIMSris Papadopoulos, Responsible for Interoperability (re Corridor intermodal operations and logistics management platform)	service provider	DiMIMSris Papadopoulos

Table 6: Greek roles

3.7 PS IT1 - Italy, Trieste Pilot Site: Mediterranean and Baltic-Adriatic and The Motorway of The Sea of South-East

Partner/ Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
POLIBA	M. P. Fanti	M. P. Fanti	Service provider Data provider	M. P. Fanti

INFO.ERA	Miriam Fonda	Lorenzo Cerini	Service provider	Miriam Fonda
ADRIA Intermodale	Alessandro Bano	Alessandro Bano	Data Provider	Alessandro Bano
PLUSERVICE	Daniela Vasari	Daniela Vasari	Service provider	no
PNAEAS	I. Di Santo	I. Di Santo	Service provider	no
SWARCO MIZAR	Silvia Capato Josè Rodriguez	Claudio Griglione	Service Provider	no
MATRAS	Antonio Maiello	-	Data provider	Yes, the truckers will give answers to questionnaire
AUTOVIE	-	Enrico Ferrante	Data Provider	NO

Table 7: Italian Trieste roles

3.8 PS IT2 - Italy, Milan/Genova: The Italian Rhine Alpine Pilot Site – Dynamic Synchromodal Logistic Modules

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
ICOOR	Giulia Renzi	Giulia Renzi	other	Yes, Giulia Renzi
SEA	Mario Alberti	Mario Alberti	other	Yes, Mario Alberti

Table 8: Italian Milan/Genoa roles

3.9 PS NL - Dutch Pilot Site, Smart Multimodal Operations Platform (SMIP)

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
Van Looveren consultancy	Rob van Looveren Responsible for Evaluation (overall)	Rob van Looveren Responsible for Interoperability (overall)	Other	X (UC4 leader)

ESC/Evofenedex	Jan Huisers Project manager		Other	NA
TX Logistik	Sebastian Ruckes		Service provider Data provider Data consumer	X (UC1 leader)
J.A.M. de Rijk	Albert Charrel Ernst		Service provider Data provider Data consumer	X
Interporto Bologna	Giuseppe Dall'Asta		Service provider Data provider Data consumer	X (UC2 leader)
Frigo Breda	Erik Janse		Service provider Data provider Data consumer	With AMD#4 Frigo Breda will join the FENIX project
UIRR	Eric Feyen		Other	X (UC3 leader)
Pionira	Stefan Gevaert		Developer connector	X (connector)
ViaService	Hans Lip		Developer connector	X (connector)
Giventis	Rein Westra		Other	NA

Table 9: Dutch roles

3.10 PS SK - Slovakia, All Ten-T Corridors and Multimodal Pilot Site

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
Mondelēz	Zharko V / Zoltan B / Jaideep P / Robert R	Zharko V / Zoltan B / Jaideep P / Robert R	Data Provider	Mondelēz Load Control Centre Controlling Dept

Magna	Zharko V / Zoltan B / Jaideep P / Robert R	Zharko V / Zoltan B / Jaideep P / Robert R	Service provider	Mondelēz Load Control Centre Controlling Dept
Girteka Logistics	Zharko V / Zoltan B / Jaideep P / Robert R	Zharko V / Zoltan B / Jaideep P / Robert R	Service provider	Mondelēz Load Control Centre Controlling Dept
DB Schenker	Zharko V / Zoltan B / Jaideep P / Robert R	Zharko V / Zoltan B / Jaideep P / Robert R	Service provider	Mondelēz Load Control Centre Controlling Dept
Accenture [and to a certain extend Alpega]	Zharko V / Zoltan B / Jaideep P / Robert R	Zharko V / Zoltan B / Jaideep P / Robert R	IT services provider [programming, cloud hosting, etc]	Mondelēz Load Control Centre Controlling Dept

Table 10: Slovakian roles

3.11 PS SP - SPAIN, The Spanish-Atlantic Corridor Pilot

Partner/Company	Name and Roles for Evaluation	Name and Roles for Interoperability	Roles Category	Are you able to identify who will measure the KPIs in your PS?
MLC ITS	Nerea Rojas Leire Balzategui	Nerea Rojas Leire Balzategui	OTHER	NO
Indra	Juan Castro (TBU)	Juan Castro (TBU)	Technology provider	Constantino Benito
Bilbao Port	Ana Ahedo Oscar Santamaria	Ana Ahedo Oscar Santamaria	Data consumer Data provider	Ana Ahedo
ATOS	Alejandro García	Alejandro García	Technology provider	Partially Yes Alejandro García

Table 11: Spanish roles

4. PERFORMANCE

4.1 Performance methodology

The performance of FENIX federation is estimated through a definition of KPIs and criteria. The individuation of these criteria is the main objective of this chapter.

It is important to underline that in the FENIX project, two levels of integration are considered: local level and interoperability level. The local level includes the connection through platforms not using the FENIX Connector. The interoperability level represents the connection of platforms using the connector to the federation. Within the FENIX ecosystem, the deployment of the **FENIX Connector** is the preferred strategy to connect platforms to the Federation. Instead, platform owners may choose to connect its services through another platform, which is operating the FENIX Connector for them. Technically speaking, these platforms are handled as “satellites”.

Considering the local level of connection, the interoperability performance of platforms is measured through the KPIs defined in the sub-activity 2.3. For each pilot, partners quantify the relevance of the KPIs in the context of the interoperability.

In the paragraph 4.3 it is reported the evaluation methodology for the performance at the federation level, considering the Connector as the most important solutions for the interoperability.

This study has been carried out with the collaboration of all Pilot leaders and technical partners of FENIX, and it is only a preliminary step for the Evaluation Activities.

4.2 Performance at local level

With reference to the different interoperability KPIs on connector selected from sub-activity 2.3, Pilot Sites were asked to express the relevance of the measured KPIs in terms of interoperability.

In detail, Pilot Sites assigned weights with values ranging from 1-5 for each KPI, in order to better understand the expected relevance regarding the platform’s interoperability.

To support this objective, the question is indeed:

How much does this KPI weigh on the evaluation of the overall Platform’s Interoperability?

The indicated values by each PS will be classified using three degrees of relevance, as follows:

- 1-2: low degree;
- 3: medium degree;
- 4-5: high degree.

To assess these measurements, the template regarding the performance at local level was sent to all Pilot Sites and their feedbacks are reported in the next paragraphs. The table confirms the list of KPIs

to be measured in each Pilot Site and indicates how much the KPIs should weigh in the context of interoperability during the evaluation activity.

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform's performance? Please select from the list a value in the range 1-5
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	1-5
	Conceptual compatibility	1-5
	Number of standards used	1-5
	Standardised Information Exchanges	1-5
Organizational and Legal interoperability	Organizational compatibility	1-5
	Interoperability between two or more different rules and/or legal (regulatory) systems	1-5
Technical interoperability	Number of architectural revisions	1-5
	Number of functionalities	1-5
	FENIX Connectivity Index	1-5
	Time of interoperation	1-5
	Standardised interfaces	1-5

Table 9: Template for performance at local level

4.2.1 PS AT - Fürnitz Pilot Site (South Austria) on the Baltic-Adriatic Corridor

Austrian Pilot will federate only one platform through DIH platform of German Pilot Site. The Pilot will not implement the FENIX Connector, and in this context the evaluation of the connector is not meaningful in the Austrian Pilot.

4.2.2 PS BE1 – Belgium, AirCargo Pilot Site

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	1
	Number of standards used (for Service providers)	4
	Standardised Information Exchanges	3
Technical interoperability	Standardised interfaces	3

Table 10: PS BE1 KPIs relevance

4.2.3 PS BE2 – Belgium, Multimodal Inland Hub-Procter & Gamble-Mechelen-Willebroek Pilot Site

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	1
	Conceptual compatibility	5
	Number of standards used (for Service providers)	1
	Standardised Information Exchanges	3
Technical interoperability	Standardised interfaces	3

Table 11: PS BE2 KPIs relevance

4.2.4 PS FR - French Mediterranean – North Sea Pilot Site

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	4
Technical interoperability	FENIX Connectivity Index (for data exchange)	4
	Time of interoperation (for synchronous UCs)	3

	Standardised interfaces	4
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Table 12: PS FR KPIs relevance

4.2.5 PS GE - Germany, Rhine-Alpine Corridor

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	3
Organizational and Legal interoperability	Organizational compatibility	4
	Interoperability between two or more different rules and/or legal (regulatory) systems	3
Technical interoperability	Number of functionalities	2
	FENIX Connectivity Index (for data exchange)	1

Table 13: PS GE KPIs relevance

4.2.6 PS GR - Greece, Greece Balkan-TEN-T Network, Adriatic-Ionian Corridor-Cyprus

Multimodal Pilot Site

Hellenic Port Community System

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	4
	Number of standards used	2

Table 14: PS GR KPIs relevance 1

Yellow Pages Platform for freight transport along the corridor

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	4
	Conceptual compatibility	3
	Number of standards used	3
	Standardised Information Exchanges	2
Organizational and	Organizational compatibility	1
	Interoperability between two or more different rules and/or legal (regulatory) systems	2

Legal interoperability		
Technical interoperability	Number of architectural revisions	1
	Number of functionalities	1
	FENIX Connectivity Index	5
	Time of interoperation (for synchronous UCs)	4
	Standardised interfaces	2

Table 15: PS GR KPIs relevance 2

Cargo Bundling Market Place Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems	5
	Number of standards used	1
Organizational and Legal interoperability	Interoperability between two or more different rules and/or legal (regulatory) systems	2
Technical interoperability	Standardised interfaces	3

Table 16: PS GR KPIs relevance 3

4.2.7 PS IT1 - Italy, Trieste Pilot Site: Mediterranean and Baltic-Adriatic and the Motorway of the Sea of South-East

AEOLIX Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance? Please select from the list a value in the range 1-5
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	3
	Conceptual compatibility	4
	Number of standards used	1
	Standardised Information Exchanges	3
Technical interoperability	Number of architectural revisions	4
	Number of functionalities	2
	FENIX Connectivity Index	5
	Standardised interfaces	1

INTERNATIONAL FEDERATIVE MODULE – INFO.ERA Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems	5
	Conceptual compatibility	2
	Number of standards used	5
	Standardised Information Exchanges	4
Organizational and Legal interoperability	Organizational compatibility	2
Technical interoperability	Number of architectural revisions	3
	Number of functionalities	2
	FENIX Connectivity Index	4
	Time of interoperation	2
	Standardised interfaces	1

SINFOMODAL - ADRIA Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems	5
	Conceptual compatibility	3
	Number of standards used	5
	Standardised Information Exchanges	5
Organizational and Legal interoperability	Organizational compatibility	2
	Interoperability between two or more different rules and/or legal (regulatory) systems	2
Technical interoperability	Number of architectural revisions	3
	Number of functionalities	2
	FENIX Connectivity Index	3
	Time of interoperation	2
	Standardised interfaces	1

TM2.0 Service Centre - SWARCO Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems	1
	Conceptual compatibility	3
	Number of standards used	3
	Standardised Information Exchanges	3
Organizational and Legal interoperability	Organizational compatibility	4
Technical interoperability	Number of architectural revisions	2
	Number of functionalities	2
	FENIX Connectivity Index	3
	Standardised interfaces	3

MYCICERO – PLUSERVICE Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems	5
	Conceptual compatibility	4
	Number of standards used	4
Technical interoperability	Number of architectural revisions	4
	Number of functionalities	2
	Standardised interfaces	4

eCMR platform - CODOGNOTTO Platform

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems	4
	Conceptual compatibility	4
	Number of standards used	5
	Standardised Information Exchanges	5
	Organizational compatibility	3

Organizational and Legal interoperability	Interoperability between two or more different rules and/or legal (regulatory) systems	2
Technical interoperability	Number of architectural revisions	4
	Number of functionalities	2
	FENIX Connectivity Index	2
	Time of interoperation	4
	Standardised interfaces	5

**4.2.8 PS IT2 - Italy, Milan/Genova: The Italian Rhine Alpine Pilot Site – Dynamic
Sychromodal Logistic Modules**

Milos Federative Services

Interoperability Layers	KPIs GENOA	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	4
	Conceptual compatibility	4
	Number of standards used	2
	Standardised Information Exchanges	4
Organizational and Legal interoperability	Organizational compatibility	4
	Interoperability between two or more different rules and/or legal (regulatory) systems	2
Technical interoperability	Number of architectural revisions	1
	Number of functionalities	3
	Time of interoperation (for synchronous UCs)	3
	Standardised interfaces	4

Table 17: PS IT2 Genoa KPIs relevance

Malpensa Smart City delle merci

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	4
	Conceptual compatibility	5
	Number of standards used	3
	Standardised Information Exchanges	4

Organizational and Legal interoperability	Organizational compatibility	4
	Interoperability between two or more different rules and/or legal (regulatory) systems	4
Technical interoperability	Number of functionalities	4
	Time of interoperation (for synchronous UCs)	3

Table 18: PS IT2 Milan KPIs relevance

4.2.9 PS NL - Dutch Pilot Site, Smart Multimodal Operations Platform (SMIP)

Dutch PS has declared that the KPIs on Connector are not applicable for operational parties of the Pilot Site. The full list of the available KPIs is reported as a template in the paragraph 3.4.2 of D2.3. Since the mentioned KPIs on connector in deliverable 2.4 are not applicable for operational parties of the Dutch PS, the weight of KPIs could not be defined.

4.2.10 PS SK - Slovakia, All TEN-T Corridors and Multimodal Pilot Site

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	1
	Conceptual compatibility	5
	Number of standards used	1
	Standardised Information Exchanges	2
Organizational and Legal interoperability	Organizational compatibility	4
	Interoperability between two or more different rules and/or legal (regulatory) systems	4
Technical interoperability	Number of architectural revisions	4
	Number of functionalities	4
	FENIX Connectivity Index	5
	Time of interoperation	4
	Standardised interfaces	5

Table 19: PS SK KPIs relevance

4.2.11 PS SP - Spain, The Spanish-Atlantic Corridor Pilot

Interoperability Layers	KPIs	How much does this KPI weight on the evaluation of the overall Platform performance?
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	5
	Conceptual compatibility	1
	Number of standards used	5
	Standardised Information Exchanges	5
Organizational and Legal interoperability	Organizational compatibility	3
	Interoperability between two or more different rules and/or legal (regulatory) systems	1
Technical interoperability	Number of architectural revisions	1
	Number of functionalities	4
	FENIX Connectivity Index	1
	Time of interoperation	1
	Standardised interfaces	1

Table 20: PS SP KPIs relevance

For the AEOLIX platform, refer to the Trieste Italian pilot (IT1).

4.2.1 Preliminary Results

On the basis of the preliminary feedback about KPIs on connectors from each Pilot Site, the analysis of data collection is presented below. Figure 1 graphically represents the number of measurements for the evaluations about every KPI.

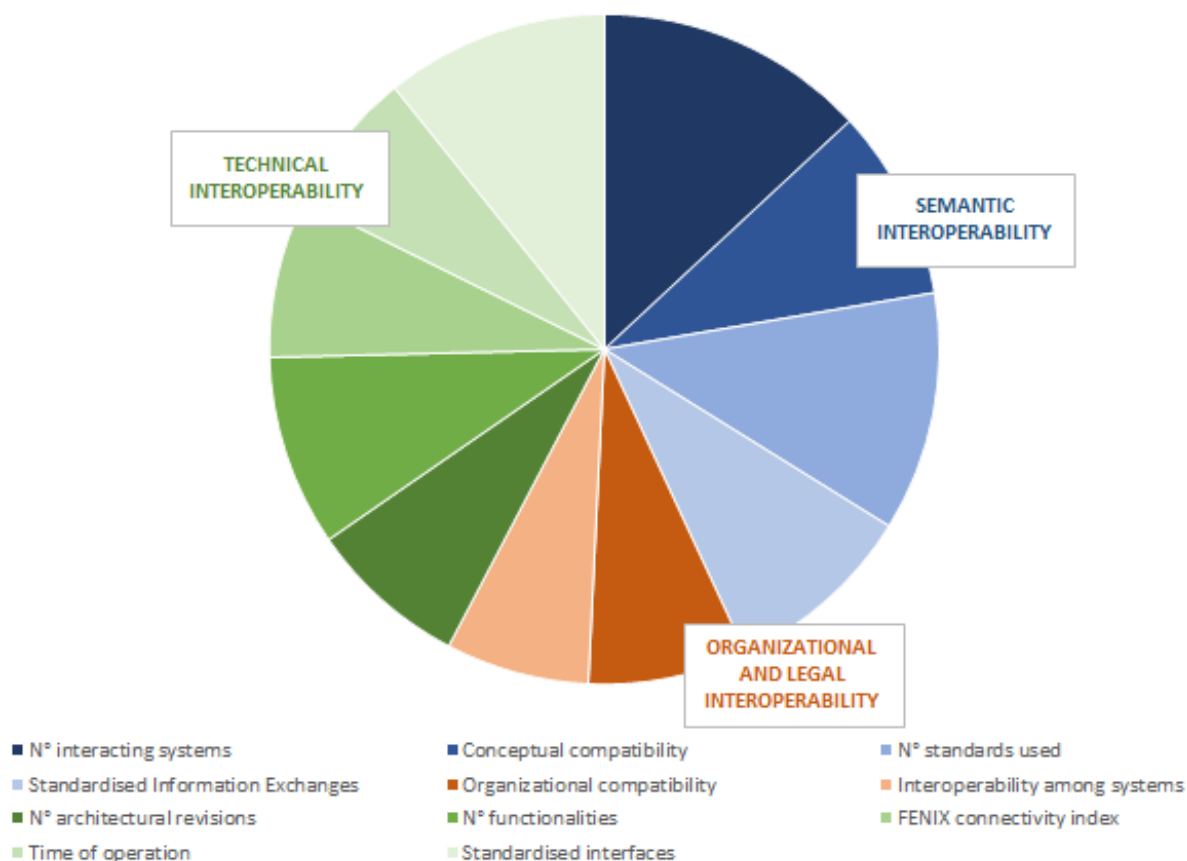


Figure 1: Number of platforms evaluating each KPIs

Generally, the KPIs related to the Semantic Interoperability present a higher frequency of choices of measurements (from 12 and 17 observations), followed by the Technical interoperability (from 9 and 14 observations) and lastly by the Organizational and legal interoperability (9/10 observations).

Furthermore, the data analysis explains that only the ‘Number of interacting systems’ have been considered by the total amount of Platforms (17 observations). Conversely, the least considered are the ‘Interoperability among systems’ (9 observations) and the ‘Time of interoperation’ (9 observations). However, every KPI is evaluated by most of the Pilots’ platforms.

Considering the interoperability performance of platforms based on the expressed measurement by the Pilot Sites, it is resulted that, the ‘Number of interacting systems’ (3.5), the ‘Conceptual

compatibility' (3.6), the 'Standardised Information Exchange' (3.6) and the 'FENIX Connectivity Index' (3.3) present the higher average.

The real value of KPIs will be measured during the Activity 5. At the moment, an important common understanding from all Pilot Site about the importance of KPIs related to interoperability has been reached.

The following table represents the averages of KPIs weights indicated by all pilots.

Interoperability Layers	KPIs	Obs.	Mean	Std. Dev.	Min	Max
Semantic interoperability	Number of interacting systems at semantic level (minimum 2)	17	3.5	1.55	1	5
	Conceptual compatibility	12	3.6	1.24	1	5
	Number of standards used	15	3	1.60	1	5
	Standardised Information Exchanges	12	3.6	1.08	2	5
Organizational and Legal interoperability	Organizational compatibility	10	3.1	1.10	1	4
	Interoperability between two or more different rules and/or legal (regulatory) systems	9	2.4	1.01	1	4
Technical interoperability	Number of architectural revisions	10	2.7	1.34	1	4
	Number of functionalities	12	2.5	1.00	1	4
	FENIX Connectivity Index	10	3.3	1.57	1	5
	Time of interoperation	9	2.9	1.05	1	4
	Standardised interfaces	14	2.9	1.46	1	5

Table 21: Averages of KPIs weights related to Platform performance

Through data analysis, the importance of the above mentioned KPIs (Number of interacting systems at semantic level, Conceptual compatibility, Standardised Information Exchanges, FENIX Connectivity Index) is evident not only because they show the highest averages, but also because they are the only four KPIs that overcome the medium scale of importance during the evaluation.

It is possible to observe this result also in Table 24, where the evaluation assigned to number of interacting systems at semantic level, Conceptual compatibility, Standardised Information Exchanges and FENIX Connectivity Index is greater than or equal to 3 for the majority of pilots.

KPIs	Level of Platform performance					
	1	2	3	4	5	Total
Number of interacting systems at semantic level (minimum 2)	4	0	2	6	5	17
Conceptual compatibility	1	1	3	4	3	12
Standardised Information Exchanges	0	2	4	3	3	12
FENIX Connectivity Index	2	1	2	2	3	10

Table 22: Total KPIs evaluations related to Platform performance

Definitely, the four KPIs considered in the previous table represent a fundamental starting point to evaluate the interoperability of the Pilot Sites, giving us important information to be considered as the basis of Activity 5 measurements.

4.3 Performance at federation level

To measure the level of performance of federation, some criteria has been defined for evaluation. Each Pilot Site has provided preliminary feedback about this framework that will be used during the Activity 5 (Evaluation Activity).

The framework shares some elements with ISA² Programme. ISA² represents the current edition of a series of five European Commission programmes providing and promoting interoperability solutions for public administrations in the European Union. This deliverable was aligned with this Programme. The performance measurement framework was performed on the basis of six evaluation criteria, five of these are derived from ISA Programme, and also with references to the cooperation taking place with technical partners and Pilot Sites.

The six evaluation criteria are described below:

- **Effectiveness:** Considers how successful the Federation has been in achieving or progressing towards its objectives.
- **Efficiency:** Considers the relationship between the resources used by an intervention and the changes generated by the intervention.
- **Relevance:** Refers to the relationship between the needs and problems in the T&L sector and the objectives of the federation application.
- **Utility:** This defines how the federation does (or does not) contribute to meeting stakeholders' needs. Hence, the utility criterion is a proxy for measuring users' satisfaction (in this case the user is the T&L companies).
- **Adaptability:** Explains the capability of the Federation to evolve in relation to emerging new needs and problems.
- **Sustainability:** Measures the capability of the Federation to be maintained after the project without the fund resources.

These criteria cover several aspects such as economic, social and technical. They are related to other activities of FENIX Project, such as: Activity 3 is related to technical interoperability, Activity 5 is related to Evaluation and sub-Activity 6.6 is related to business model.

In the following chapter, for each criterion, a framework methodology is proposed to be used for Performance Evaluation. Also, each criterion is associated with one KPI, its description and measurement.

CRITERIA	KPIs	KPIs description	Measurement
EFFECTIVENESS	Degree of effectiveness	At what extent has the Federation achieved or progressed towards its objectives?	Questionnaire/Survey
EFFICIENCY	Cost-effectiveness of the federation	Cost-effectiveness analysis to assess the ratio between allocated funds and actual results of the federation, by taking into account: - Costs of project; - Costs of development; - Operational costs.	Cost-effectiveness analysis
RELEVANCE	Degree of relevance	To the stakeholder's perception, to which degree the Federation address the logistics needs and problems?	Questionnaire/Survey
UTILITY	Degree of utility for each Stakeholder group	To what extent does the Federation satisfy (or not) stakeholders' needs? How much does the degree of satisfaction differ according to the different stakeholder groups? Stakeholder: Public Authority Operator within the FENIX Project Operator not in the FENIX Project	Questionnaire/Survey
ADAPTABILITY	Degree of adaptability	To what extent does the Federation evolve in relation to emerging new needs and problems?	Questionnaire/Survey

SUSTAINABILITY	Degree of financial, technical and operational sustainability	<p>To what extent is the financial, technical and operational sustainability of the developed solutions ensured?</p> <p>-Share of stakeholders expecting that results achieved so far would last when funding for the project would not be available in the future.</p> <p>-Share of solutions requiring operation and maintenance costs to keep running.</p> <p>-Share of stakeholders who would pay to keep on using specific solutions.</p>	Questionnaire/Survey
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Table 23: Template for performance at federation level

Following the previous framework, during Activity 5, each Pilot Site will provide feedback related to the questionnaires and surveys in order to validate the KPIs.

The data collection phase related to questionnaires will involve a mix of quantitative and qualitative data collection methods, aiming to ensure an adequate level of response to the evaluation questions spelled out in the evaluation framework.

The questions or surveys are not available at this time. Considering that not all pilot have the same maturity level of FENIX connector deployment, the main measurement (survey or questionnaire) will be defined during the pilot roll out, in order to have a better quality of data collection, because Pilots are not fully aware of the potential of Federation.

In activity 2, they will be provided with partners and pilot partners and also will be available via Pilot Leaders targeting different stakeholder groups: i.e technical, T&L operators, Member State, standardisation organisations.

It is generally more important to identify a good set of evaluation questions, than to be too concerned about how to categorise the question, so long as the different criteria are addressed.

It will be necessary to discuss and fix the evaluation questions with the Pilot Leaders and technical groups. Since the evaluation questions do not need to be set at this time.

CONCLUSIONS

This deliverable is part of the validation process in order to measure the interoperability in the FENIX federation and specify the interoperability roles for each Pilot Site.

Pilots provided a list of their internal organization regarding the roles for evaluation activities and the responsibility for interoperability. In some pilots the responsible for evaluation and for interoperability are overlapping. In most of the cases, there is a responsible for each Pilot partner, while in other pilots, such as in the Austrian, there is only one responsible for the whole pilot.

These figures will play a key role in the evaluation activities to guarantee a better quality of data collection.

Regarding the performance, two methods of evaluation related to different levels of integration have been defined. These activities are strictly connected to sub-activity 2.3, in fact the previous KPIs defined in the D2.3 will be used for the evaluation of the performance at the local level (platform level).

Each Pilot Site provided a weighted value about the KPIs on the connector following the template validation. In some cases, the provided values are the same for each pilot platforms, while in others the pilots indicated different values for different platforms. For example, Greek Pilot defined different values for its platforms.

A first common understanding from Pilot Sites about the performance validation has been defined through the assigned values at KPIs in chapter 4.2. KPIs mostly affecting interoperability are: Number of interacting systems, the Conceptual compatibility, the Standardised Information Exchange and the FENIX Connectivity Index.

It is significant to underline that in the Dutch pilot, the measures about the maturity of the interoperability and the mentioned KPIs are not applicable for operational parties. Therefore, in this deliverable the contribution from Dutch Pilot Site is missing.

Regarding the performance at federation level, the defined framework will be used during Activity 5 for the evaluation process. It will be generally more important to identify a good set of evaluation questions according to technical partners and pilot sites.

At this stage, this deliverable only investigates the evaluation methodology to be used in the next activities after the start of pilots roll out and not real evaluation values.

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