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Abstract

The Regulatory (REG) aims at the identification of regulatory need(s) and to indicate any need to amend the existing regulation or to introduce a completely new regulation regarding SIGN-AIR's Solution namely SIGN-AIR platform.

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SIGN-AIR

[IMPLEMENTED SYNERGIES, DATA SHARING CONTRACTS AND GOALS BETWEEN TRANSPORT MODES AND AIR TRANSPORTATION]

SIGN-AIR

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1. Executive summary

The regulatory document provides a framework to support industrialisation and secure the entry into operations of the corresponding SESAR technological solution consisting into the SIGN-AIR platform. The REG document is produced to cover, in particular, all regulatory contextual information existing at the beginning of the development activities. It also identifies the needs for amendments to the available regulations to support the scope of the SIGN-AIR Solution. An advanced interoperable web platform, the heart of SIGN-AIR platform, encompasses comprehensive templating and communication tools. This platform empowers Transport Service Providers (TSPs) in negotiating and managing contracts (data sharing agreements and/or smart contracts) seamlessly, all while maintaining a live link to a monitoring dashboard. SIGN-AIR platform forms a cohesive ecosystem to streamline collaboration among TSPs of multimodal transport. The aforementioned solution is focused on multimodality which is a relatively new flagship of SESAR.

This report is the initial version of REG, two updates will follow in M19 and in M32. As the exact relation between the SIGN-AIR platform and the ATM system is not yet clear, the identification of the needs for amendments to the available regulations is not yet performed. However, this document detects and details the main components of the solution, and it is a first attempt to capture the regulatory needs.

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2. Introduction

2.1 Purpose of the document

The purpose of this section is to indicate any need to amend the existing regulation or to introduce a completely new regulation regarding SIGN-AIR's Solution. As the SIGN-AIR project will result in one SESAR technological solution (the SIGN-AIR platform), it should be emphasised that the platform will simplify the process of managing Data Sharing Agreements for the transport service providers (TSPs) and legal parties. Since the foundation of the project are the research outputs of the recently finished SYN+AIR project, the development of the platform starts with the TRL2 and at the end the technology that we will develop will reach the TRL7.

To show the progress of the technology from TRL5 to TRL7, a large amount of synthetic data will be created to test the technology in a controlled environment. In the end, in order to show that this technology reaches TRL7, the proposed use cases will be used to test the platform in an operational environment.

All innovations that the SIGN-AIR platform will bring into the TSPs' everyday operations should be regulated in order to enable safe, secure, reliable and smooth data exchange. Therefore, in the REG deliverable, we will refer to all regulations which are in place, but which could be subject to changes by implementation of our Solution. Moreover, if a need for a new type of regulation would be observed, we will suggest it, indicating its purpose. It is important to note that SIGN-AIR will take into account the discussions, regarding to "data spaces" and data privacy which is a key subject that is being addressed explicitly that it is also a key matter in a lot of EU ID-related activities.

2.2 Intended readership

Regarding readership who will be directly or indirectly involved in regulation changes, we can divide them in several categories:

All stakeholders/subjects connected to SIGN-AIR platform (core, direct and indirect stakeholders)

- Transport Service Providers (TSPs) who are registered and use SIGN-AIR platform to establish new collaborations, generate and manage data sharing agreements and smart contracts.
- Travel Companions (TCs) companies connected to SIGN-AIR platform, to show the results of the data sharing agreements to the passengers.
- All stakeholders/subjects indirectly connected to SIGN-AIR platform.
    - Travellers, who are indirectly connected to SIGN-AIR platform through the TCs,
    - Local authorities such as Public transport authorities (PTAs) , indirectly support multimodality.
    - Regulatory bodies (EASA, etc.).

Moreover, this REG deliverable could help those who are interested to understand the new concept of cooperation and to make the decision to join the SIGN-AIR platform.

2.3 Background

At the moment, background is not applicable.

2.4 Structure of the document

This document consists of four sections. After the executive summary, provided in section 1, section 2 introduces the main goal of the REG deliverable, indicates the intended readership, and gives the terminology to be used throughout the document, as well. Section 3 is dedicated to all regulations that apply to THE SIGN-AIR solution, and their connections to the solution, suggesting possible changes in the existing regulation or needs to establish new ones. In the last section, we will provide all references and appendices.

2.5 Glossary of terms

This section identifies terms and their definition and includes a reference to the source of the definition. For this first version of REG, there are no specific glossary terms that need to be mentioned.

2.6 List of acronyms

Table 1: List of acronyms

Acronym	Definition
ATM	Air Traffic Management
FTI&U	Fast Track Innovation and Uptake
KPA	Key Performance Area
REG	Regulatory deliverable
SESAR 3 JU	SESAR 3 Joint Undertaking
TRL	Technology Readiness Level
TSPs	Transport Service Providers
TC	Travel Companion
DSA	Data Sharing Agreement
SC	Smart Contract

3. Regulation needs capture

Each SESAR Solution must develop a REG deliverable according to the target level of maturity (it refers to corresponding Maturity Criteria). In particular, fast track innovation & uptake (FTI&U) aiming at the highest maturity level must be able to provide a complete document, with attachments. However, the connection the of SIGN-AIR platform with the ATM system cannot be clearly defined yet, but during the project lifetime, the regulation needs will be captured. As a starting point the following sections present the main components/enablers that will be examined for, potentially, identifying the new and amended rules.

3.1 Need for a new or amended rule(s)

As it has already been mentioned, the SIGN-AIR project will result in **one** SESAR technological solution, the SIGN-AIR platform. The SIGN-AIR platform consists of various components/enablers that will be developed or extended from an existing mature level. It is important to mention that the components per se might not affect existing regulation but the content of the data sharing agreements and/or smart contracts might. For example, if a trigger in a smart contract suggests the change of a route, then the need to amend rules might be examined.

The components that will be developed/extended/tested in SIGN-AIR are:

- Catalogue of Catalogues,
- Matching Mechanism,
- Contract Templates,
- SIGN-AIR platform,
- Standardisation Algorithms,
- Optimization Algorithms and
- Monitoring Dashboard.

Since the SIGN-AIR platform will simplify the process of managing Data Sharing Agreements for the TSPs and legal parties, its connection with the ATM is still blurry. However, based on the technology description specific elements have been identified that might affect regulation. For each of the listed elements, some remarks regarding regulations are given.

Catalogue of Catalogues. The Catalogue of Catalogues contains data attributes provided by TSPs.

Matching Mechanism. In the Matching Mechanism data sharing between two TSPs should be regulated. Since data will be shared online, special attention should be paid to data protection and cybersecurity.

Contract Templates. At the core of the SIGN-AIR project are the contracts signed between two TSPs. The SIGN-AIR platform will provide templates for both Data Sharing Agreements (DSA) and Smart Contracts (SC). Since the DSAs and the SCs should be signed, it implies the need for compliance with legal requirements to secure all these documents from missuses. By signing a DSA, the datasets (what) and the objective of sharing them (why) will be clear, while by signing an SC, the way operational obligations (actions) (how) and when to execute them (when) will be clear and continuity of data sharing will be secured with a proof statement.

SIGN-AIR platform. The SIGN-AIR platform brings innovation which lies in the fact that it will digitize a process that is dominantly manual up to today. This will lead to the determination of completely new issues increasing the need for new regulations.

Standardisation Algorithms. The data exchange should be executed with standardised datasets. The SIGN-AIR will develop algorithms and processes to facilitate and execute standardisation, to assist operators who may have non-standardised data to share, which further must be in accordance with the law.

Optimization Algorithms. Both the Intermodal Timetable Synchronisation solution and the Intermodal Disruption Management Tool (please refer at TRANSIT project) have variables related to the time schedule. The aim of these algorithms is to facilitate the decision-making process of airlines or train operators.

Monitoring Dashboard. The Monitoring Dashboard aims to monitor the contracts signed in SIGN-AIR. To achieve this, the contracts are fully digitized, and each contract defines quantifiable triggers and actions that the Monitoring Dashboard will use. And again, legal background should be provided.

Apart of these components SIGN-AIR has a legal layer which is presented briefly in the following table (Table 2). This legal layer will consider all existing and proposed regulations applicable to each developed component as well as to the content of the DSAs et the SCs. Hence the following version of REG might contain suggestions of amendments to some particular pieces of legislation. To tackle this challenging process, SIGN-AIR has two dedicated tasks that aim to identify applicable regulations: T2.7 Legal drafting of Contracts and T2.17 Conclusions about the pilots and Policy recommendations.

As the project progresses, and certain scenarios/use cases are developed and tested, the connection of the SIGN-AIR platform with the ATM will be clarified. Most probably, it will affect the disruption management, since the real-time data regarding possible delays in the multimodal chain could help TSPs to provide seamless transport, and also ATM to reduce potential delays and increase the throughput.

Therefore, we will be able to propose suggestions for amending existing regulations after the finalization of the contacts templates (data sharing agreements and smart contracts) and the small-scale pilots of SIGN-AIR.

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Table 2: SIGN-AIR's platform legal layer

Terms & Conditions	User agreement	Data Sharing Agreements	Smart Contracts
The provision of the SIGN-AIR platform • Rules between platform and TSPs • The obligations, warranties, rights of the platform operator vis a vis the users (TSPs) • The obligations, warranties, rights of the TSPs vis a vis the platform operator • Framework for Data Sharing Agreements and Smart Contracts **Rules between the TSPs** • Default rights and obligations concerning data processing. • Essential rights and obligations concerning Smart Contracts • These contracts will incorporate the T&Cs • Rules of precedence between documents in case of contradictions	**Identification of the authorized users of the TSP** • Signing representative, administrative (negotiator), technical (data catalogues) • Privacy policy will protect their personal data. • Acknowledgement of application of T&Cs	**Between Data Provider TSP and Data Consumer TSP** • Terms and conditions for the allowed use of data • Set out a Multimodal Transport Objective for the data sharing (e.g., Single Ticketing, Synchronization of timetables etc.) • The objective determines the required datasets. • The objective determines the Triggers and Actions of the Smart Contract and the issues of Revenue Sharing and Responsibility Sharing • Legal principles already included in Terms & Conditions (incorporated) • Specific obligations of DSA will prevail (negotiation and drafting) • Mandatory law must be taken into consideration	**Based on "external smarter contract model"** **Operational contract that details the Objective of the DSA** • Will define specific Triggers and Actions • Trigger: a certain condition, event, choice • Action: obligation that must be fulfilled in case a Trigger is realized • Contains terms of Revenue Sharing and Responsibility Sharing • Revenue Sharing: how the revenue or benefit of Actions are shared between TSPs • Responsibility Sharing: how liability is shared (e.g., who will pay delay/cancellation compensation to a traveler in case of certain Triggers)

3.2 Objectives to be achieved

The main objective of the SIGN-AIR platform is to enable safe, secure, reliable, and smooth data exchange between two TSPs. To achieve this objective data should be standardised and all processes should be regulated. During the progress of the project more information will be available.

3.3 Expected benefits

The benefits of the SIGN-AIR platform are twofold. Firstly, it will give an opportunity to TSPs to have the needed data at the right time, to have better situational awareness and to react in an appropriate way, proactively. On the other hand, passengers will benefit from TSPs' reaction, which will reflect in seamless door-to-door transport.

Additionally, expected benefits could be perceived by ATM, through better use of resources based on the real-time data. During the progress of the project expected benefits will be elaborated in more detail.

3.4 Identify new or amended regulatory material

New or amended regulatory material will be identified during the SIGN-AIR project as the project will progress and the connection of SIGN-AIR and ATM will be clearer.

3.5 Standard development support

The standardisation activities associated to the SESAR Solution - SIGN-AIR platform, can be divided into two streams:

1) To be able to exchange the needed data, TSPs should have the data in digital form and in standard format, so, to generate in a correct way the DSA and SC (Task 2.2).
2) To be able to establish connection between SIGN-AIR platform and ATM system standard will be identified. Thus, as project progresses, these standards development will support the future deliverable of regulation (in M19 – D2.6 and in M32 – D2.13).

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