

TAMIS in TEMS - Setting up the basis for an Audiovisual data hub

ISAN International Agency
France Télévisions

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1. Introduction

a. *Brief overview of organisation and Industry*

The Trusted European Media Data Space (TEMS) is a consortium of 42 partners from 12 European countries aiming to set up and deploy a secure and trusted data space to enable Audiovisual and Media organisations to work together to share and access data in a mutually advantageous manner, in full compliance with the data protection legislation.

The media industry can be defined as a varied collection of organisations that share the production, publication and distribution of media including broadcast television, radio broadcasting, consumer books and magazines, newspapers, film, and business-to-business communications.

The media industry has changed profoundly in recent years, driven by new digital technologies. The COVID-19 crisis has accelerated these changes and led to the adoption of streaming services, which has shaken up the business models of traditional operators in the media sector. TEMS is seizing the opportunity to create additional value from existing assets currently held by media players to develop new business models.

TEMS has articulated a forward-looking vision: “to create a secure and reliable European Data Space specifically designed for the media sector—a dynamic ecosystem where collaboration and innovation thrive”.

Establishing a Data Space for any industry sector is a complex, multi-layered endeavour that necessitates a cooperative approach, drawing together a diverse array of stakeholders with unique perspectives and expertise. In the short term, the Data Space must be practical and ready for implementation, and it must address the requirements of a carefully selected set of key Use Cases, which for TEMS involves eight distinct trials. Beyond initial deployment, the Data Space should be inherently scalable and adaptable, enabling the inclusion of new participants, data products, and services, as well as the seamless incorporation of future use cases. To ensure long-term viability, the design must incorporate modular and interchangeable Building Block implementations, promoting openness, adaptability, and flexibility to meet emerging needs and incorporate innovative solutions over time.

TAMIS (Traçabilité dans l’Audiovisuel des Métadonnées de manière Distribuée et Sécurisée) is one of the eight trials mentioned above, dedicated to the Audiovisual production ecosystem. It will showcase the benefits of TEMS – the European Media data Space co-funded by the Digital Europe Programme of the European Union under grant agreement n° 101123423.

b. *Main stakeholders and the roles they play in designing the use-case*

CST

CST is the first ever association of French film and audio-visual technicians (with more than 700

members), also the Film Technicians' Club (more than 20 member associations), mainly funded by the CNC (French cinema state agency). The CST hosts working groups to define recommended practices and drives French standardisation activities in the cinema sector. The association is responsible for the technical management of several festivals, including Cannes. The CST has many years of experience with compliance checks in cinemas and also advises cinemas on how to ensure the best possible experience. It is organised into eight departments: Production-Direction, Image, Sets-Costumes-Accessories, Sound, Post-production, Diffusion-Distribution-Exhibition, Immersion, Broadcast. CST knows the ecosystem very well and will be able to test the solution with many stakeholders to finetune the use-case. As part of the process, CST will label the status of eligible participants.

PROCIREP

PROCIREP (Société des Producteurs de Cinéma et de Télévision) is the French Collective Management Organisation (CMO) for audiovisual works' producers, representing circa 900 French producers and managing (including through its sister company ANGOA) a yearly consolidated amount of €70M in producers' royalties (mainly private copy remuneration and retransmission rights) and cultural funds. As a CMO, PROCIREP is a privileged contact point to French producers and their professional organisations, and a permanent contact with similar producers' organisations throughout Europe, notably through its association EUROCOPYA (the European Association of Audiovisual & Film Producers' private copy collective management organisations).

PROCIREP is also in charge of the operational management of the French ISAN Agency, a not-for-profit association co-founded with French author societies, and as such regularly exchanges with other national ISAN Agencies in Europe, under the supervision of ISO's ISAN International Agency (ISAN-IA).

As audiovisual producers are the cornerstone of metadata exchange processes (they are in charge of the financing, artistic development and shooting of the audiovisual work project, and responsible for the delivery of the final version's master copy to the broadcasters and distribution platforms, in relation to post-production companies), it is of prime importance that they are associated to – and endorse – the metadata exchange process that will be set up under the TAMIS service offer.

In the context of the trial, PROCIREP will drive the developments of mandatory services to onboard producers and share datasets (it manages an extensive database of producers' rights that could be made available through the dataspace).

ISAN International Agency (ISA)

ISAN International Agency (ISAN-IA) is a non-profit association founded in 2003 by representatives of audiovisual producers, authors, and content owners (AGICOA, CISAC, and FIAPF). ISAN-IA has been appointed by ISO to serve as the registration authority for ISO 15706 (International Standard Audiovisual Number) also known as ISAN.

The ISAN system counts 20'000+ users from 81 countries, including audiovisual producers, right holders, broadcasters, VoD platforms, metadata providers, film archives and other audiovisual databases.

ISAN operates through a network of authorised registration agencies that offer services to local ISAN users. 11 European countries have so far an appointed ISAN registration agency: Belgium, Denmark, France, Germany, Italy, The Netherlands, Poland, Portugal, Serbia, Spain, Switzerland.

ISAN-IA has developed and continues to maintain the ISAN central registry for allocating new ISAN identifiers and resolving existing ISAN, storing audiovisual metadata related to ISAN, and providing online access to this data to the industry. The ISAN registry operates within a scalable distributed micro-services architecture exposing rest APIs to its users.

The ISAN standard identifier supports audiovisual data interoperability within the TEMS dataspace, enabling seamless data exchange and valorisation for stakeholders in production, distribution, rights management, AI, and other emerging audiovisual use cases.

France Télévisions

France Télévisions is a French public broadcaster. Its mission is information, education and entertainment. France Télévisions supports movie and audiovisual creation and performing Arts. With its four national channels, 24 regional channels, and nine overseas channels (TV and radio), one news channel completed by a wide digital offer, France Télévisions is the first French audiovisual group. FTV produces content especially for live sporting events and performing Arts and covers most major news events. France Télévisions will coordinate the development of the Tamis use-case, ensuring it will benefit from a variety of stakeholders along the data value chain.

France's national audiovisual institute (INA)

As a leading institution in the field of digital audiovisual content, INA is renowned for its commitment to enhancing collections and facilitating access for diverse audiences. With recognised expertise in archiving, cataloguing and managing heritage content, INA's mission as a public service entity encompasses the promotion, digitisation and preservation efforts of millions of hours of valuable content. In particular, the institute preserves historical archives covering more than 70 years of television and 80 years of radio, as well as recent productions by public broadcasting organisations, which are made available for commercial and in-house use.

INA will provide datasets or corpora that could serve as demonstrators or test components. The sharing of datasets is intended to improve the resources available for Tamis development and testing.

Lum::Invent

Lum::invent is a company founded in early 2019. Its expertise covers the following fields:

- process of digital audio-visual content
- validation and delivery of master files
- artificial intelligence
- live processing
- high performance processing in web browser environment

Lum::Invent will develop software components to enable data transactions within the use case.

Startin'blox

Startin'blox provides a data search engine technology enabling any actor to easily integrate data space into their daily applications. It is based on the latest interoperability standards and enables the creation of reusable plugins that ease the use of all data in the data space in many use cases.

Startin'blox brings its expertise in decentralised web applications to the Tamis use-case enabling seamless data sharing and interoperability. Startin'blox will provide the technical components needed for the use case and further provide plugins that can be used out of the box to interact with these components.

2. Context & Challenge

a. Brief description of the problem that the use-case addresses

Audiovisual production is not just about producing and manufacturing a programme of images and sounds. The added value of the descriptive and technical information linked to the different versions of audiovisual work is huge. When this metadata is reliable and easily accessible, it speeds up the production process, helps to market our European audiovisual heritage and helps tracking and remunerating rights holders when these audiovisual works are exploited. As of today, a lot of information and metadata (descriptive or technical) are lost during the production process, making it mandatory to rework many actions.

A large number of stakeholders are involved in the audiovisual value chain, each with its own information system. TEMS can help provide the audiovisual production ecosystem with a decentralised data exchange network, enabling interoperability between these multiple actors and a data tracking solution for audiovisual work.

As its first use case, the TAMIS initiative aims to demonstrate an improved data exchange process among INA, PROCIREP and ISAN, focusing on the efficient management of audiovisual rights.

In this very simple scenario:

- INA generates verified monthly broadcasting data, providing detailed, minute-by-minute records of all content broadcast on 20 French TV channels during a given month. This data includes ISAN identifiers wherever available.
- PROCIREP, on the other hand, is responsible for collecting royalties from broadcasters and redistributing them to rights holders. To achieve this, PROCIREP relies on ISAN identifiers within the INA dataset to match broadcast work with its rights database and accurately remunerate rights holders.

However, the current process faces challenges: INA's datasets only partially include ISAN numbers, leaving a lot of work without proper identification. Resolving these gaps requires a costly and time-intensive manual process, which impacts the efficiency of the system.

3. Solution description

a. Solution implemented to address the identified challenges

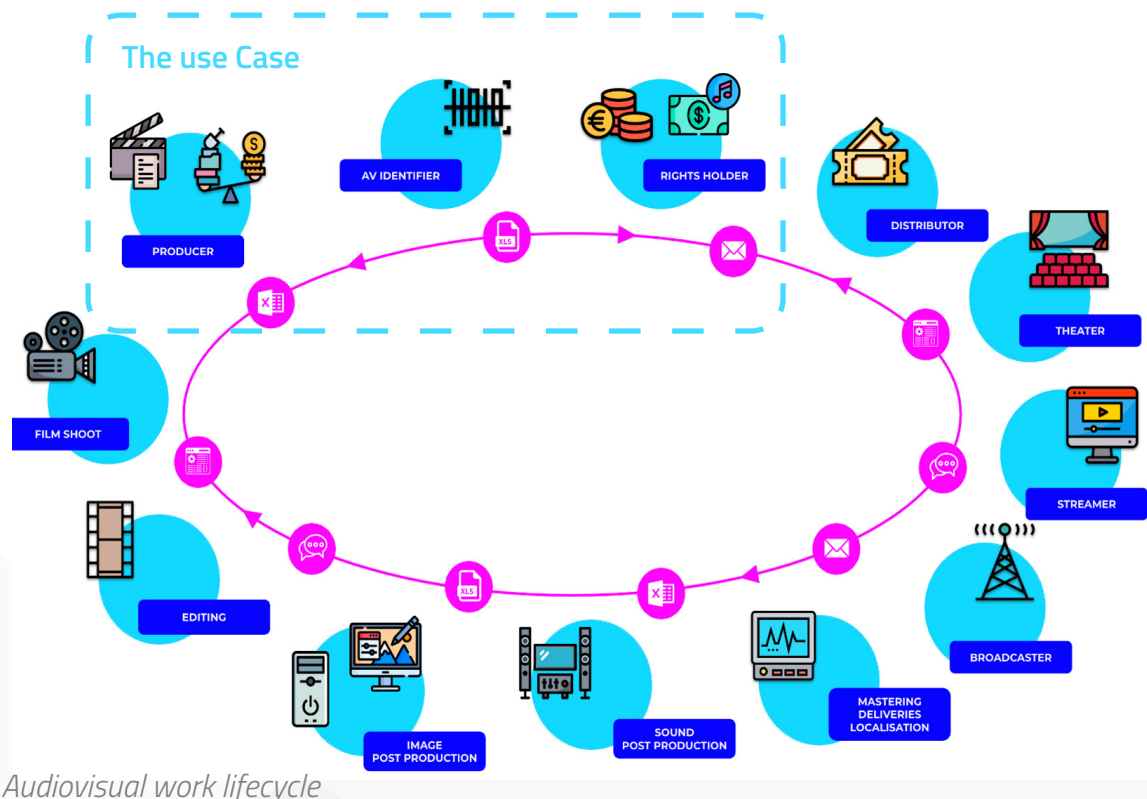
The European audiovisual industry, characterised by a multitude of smaller players alongside larger organisations, often face challenges in exchanging information across diverse stakeholders. TAMIS addresses these needs by offering tools to enable interaction within the data space. These include "connectors as a service," software applications for managing proprietary data and shared data obtained through TEMS, and specialised solutions for use cases such as content production, distribution, or rights management.

A core functionality of TAMIS is facilitating collaboration within trusted user groups. For example, during a film's production, a producer must share a wide range of data with post-production teams handling editing, visual effects, soundtracks, dubbing, and subtitling. Each stakeholder needs real-time access to the latest updates for both creative and technical versions of the film. Simultaneously, the producer interacts with broadcasters, rights management organisations, international distributors, and other stakeholders.

For a single film, the significant volume of data exchanged - encompassing multiple creative and technical versions - involves an extensive network of collaborators. This complexity increases as the work progresses through its lifecycle. TAMIS aims to optimise these data flows by:

- Universally identifying all work and their different versions with the ISAN Standard Identifier,
- Structuring metadata in interoperable formats with the TEMS Ontology, and
- Sharing relevant information with appropriate stakeholders at each stage, from production to distribution, rights management, broadcasting, archiving, and beyond.

TAMIS is a highly adaptable framework, capable of serving an infinite variety of specific use cases.



The implementation phase will rely on some specific use cases occurring at different stages of the lifecycle of audiovisual works.

Regarding the first use case explained in the previous section, and to address this issue, the parties involved are exploring a smart dataset enrichment solution that seamlessly integrates into the existing workflow. The goal is to maintain the current structure of bilateral file exchanges while enhancing the dataset's completeness and reliability.

This use case involves generic software components designed to streamline the import/export of datasets into a database, expose these datasets in TEMS and store datasets obtained from the dataspace. Additionally, a specialised application will be developed to process INA data and match it with ISAN identifiers, addressing the unique requirements of this use case.

Furthermore, an audiovisual metadata matching API will be developed by ISAN-IA and made accessible as a service offering on TEMS.

Key Steps of the use case:

1. ISAN Matching Service:

ISAN-IA provides a matching service offering on TEMS that INA contracts for this use case. While the service is primarily automated, ambiguous matches require manual resolution (deduplication). Results from the matching service are delivered asynchronously, as the process may take some time to complete due to the human interventions.

2. Dataset Exchange (current situation):

- *INA initiates the process by uploading the dataset to the local database.*
- *INA then creates an offer to enable access to PROCIREP. This offer includes the dataset without ISAN enrichment, reflecting the current situation. This dataset remains useful to PROCIREP to process some forecasts.*

3. ISAN Matching Process:

- *INA starts the ISAN matching process and monitors its progress through a dedicated dashboard.*

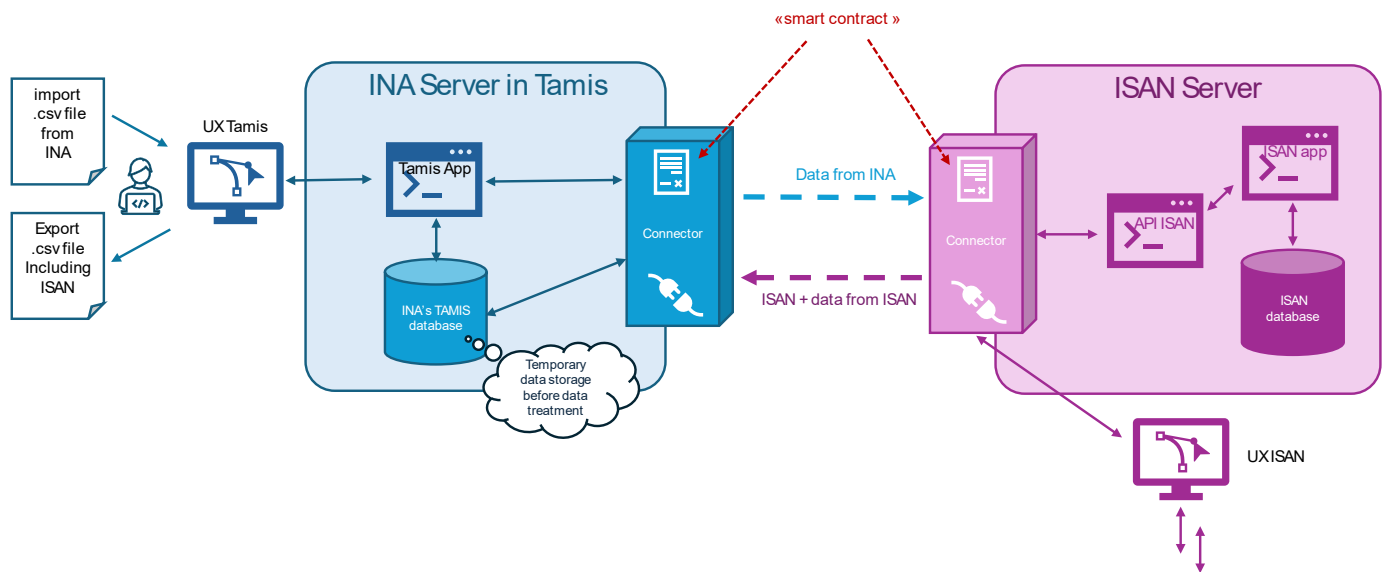
4. Enriched Dataset Publication:

- *Once ISAN matching is complete, the dataset is enriched with ISAN identifiers. INA can then publish a new offer for the enriched dataset to enable access to PROCIREP.*

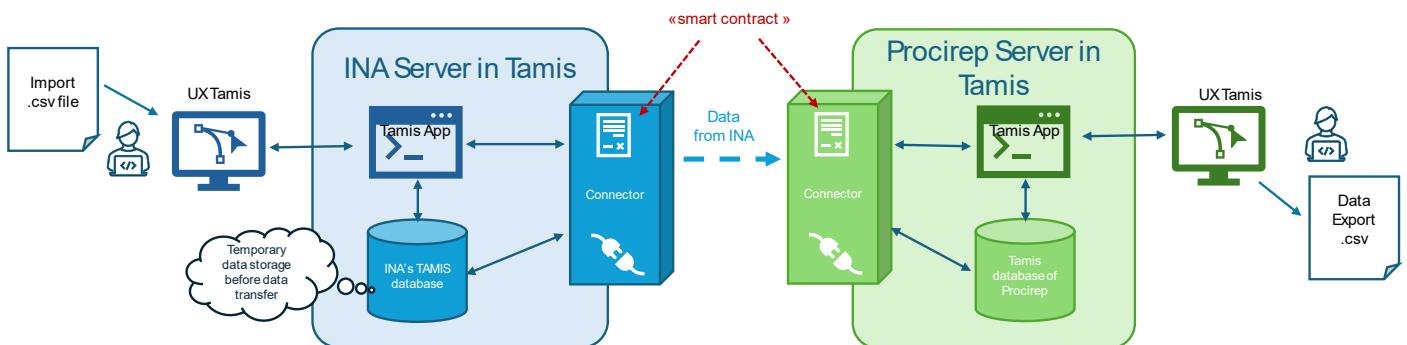
5. PROCIREP Access and Integration:

- *PROCIREP negotiates a contract to access the enriched dataset.*
- *The enriched dataset is downloaded in the local database and exported as a file and integrated into PROCIREP's existing processes, significantly accelerating the reconciliation of rights and remuneration workflows.*

The data exchange between INA and ISAN: ISAN matching service



The data exchange between INA and PROCIREP, whether the data is enriched with ISAN or not.



This use case exemplifies the efficiency and scalability introduced by TAMIS, gradually optimising the handling of audiovisual metadata and processes for all stakeholders in the audiovisual rights ecosystem. By leveraging the ISAN standard identifier, this use case illustrates TAMIS' potential to streamline audiovisual rights management, delivering significant benefits to all participants in the value chain.

b. Role of technology in the development and deployment of the solution

Tamis intends to rely on state-of-the-art technology with a clear preference for open-source components and certified implementations to also set up a sustainable business model and ensure interoperability and reversibility of the required components. Protocols and components will preferably be based on standards, if they exist.

Within TEMS, TAMIS serves as a sectorial sub-data space specialised to the needs of the audiovisual sub-sector. Its primary objective is to streamline the exchange of data and metadata associated with the production and distribution of audiovisual works, all within a trusted environment. By connecting workflows to the Data Space, TAMIS enhances production and distribution processes, ensuring seamless interoperability between solutions.

TAMIS is designed as a framework that supports the audiovisual ecosystem, providing tools to facilitate the transition to the digital economy. Crucially, it aims to smoothly integrate into existing processes and workflows, enhancing them incrementally rather than disrupting them. This progressive adoption approach minimises risks, enabling users to improve workflows step by step by introducing data exchanges on TEMS, without jeopardising what already works effectively.

To sum up, technology is a key element in the data exchange, through the standards, connectors but also services provided.

4. Implementation

a. How the solution was integrated into the use-case organisation's existing systems or processes

At this stage, no technological choice is clearly made. The project team is exploring diverse implementation of data space connectors. The goal is to rely on the data space protocol from IDSA and the Trust framework from Gaia-X.

The first implementation will also propose a “connector as a service” that will prevent organisations from costly developments while bringing them the benefits of the use-case and of the data space. It will later enable newcomers to “test before joining”.

b. Significant milestones or challenges during the implementation phase?

Stakeholder	Description of challenge	Dimensions					Difficulty experienced (Low, Medium, High)
		Design of the use-case	Governance of participants	Development of elements & apps	Integration of systems & participants	Using the use -case	
CST	Definition of TAMIS offering	✓					Medium
	Criteria for onboarding		✓				Medium
Tech provider	Take into account low skills in data management and IT	✓		✓	✓		High
Tech provider	No common data model				✓		Medium

5. Benefits & Impact

a. Measurable use case implementer's benefits observed since the implementation?

An assessment of technological solutions for data-sharing is currently in process, to simplify the integration, enhance interoperability and increase trust and control of data.

b. Benefits for the end-users

The use-case is not yet deployed but we expect the following benefits.

Description of benefit	Role this benefit applies to	Dimensions			
		Technological	Operational	Functional & participant-related	Governance & legal
Data quality increased	Data holders	✓	✓		
Speed increased	Data consumers		✓	✓	
Cost saving	All participants		✓		

Increased quality and reliability: metadata will be associated with the audiovisual work from their creation thanks to a unique easily accessible identifier. Manual copies will become obsolete.

Enhanced operational efficiency: the automated operations will speed up the processes.

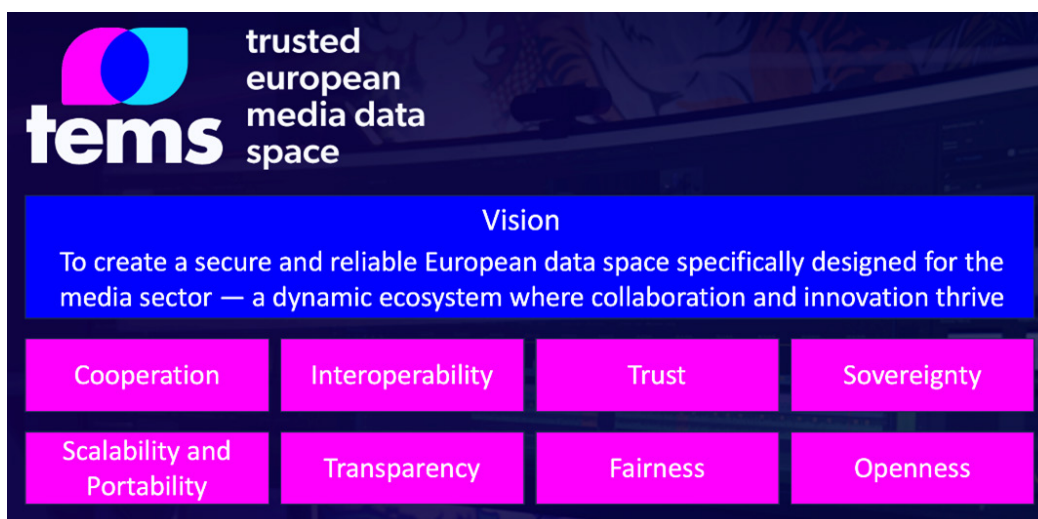
No disruption: with a complete set of tools to erase the complexity of the data space, the stakeholders will be able to smoothly integrate the new data exchange workflows in their processes.

New revenues: more reliable metadata will enhance the visibility of audiovisual works, thereby improving their utilisation.

6. Added Value through Gaia-X

a. Alignment with the [Gaia-X vision](#)

Trusted European Media Data Space (TEMS) project carries a bold vision: **to create a secure and reliable European Data Space specifically designed for the media sector—a dynamic ecosystem where collaboration and innovation thrive.** The vision is based on eight key pillars:



TEMS Vision and Key Pillars

1. Cooperation

By positioning itself as an umbrella structure, TEMS can represent a single European digital space bringing together players of different sizes and those from various backgrounds to offer opportunities for data valorisation, create new business models and to compete with powerful players in AI or social networks sectors. TEMS can also uniquely showcase the current and future media initiatives, boosting exchanges between players who currently do not know each other because of various barriers (unfamiliarity, language barrier, fear of competition, among others).

2. Interoperability

TEMS will focus on achieving interoperability between assets, infrastructure, systems and platforms of TEMS' participants. It will use a modular architecture, made of interoperable Building Blocks from different technology providers. It will also interoperate with other Data Spaces in Europe and beyond. For that purpose, TEMS will utilise open standards, aligned with specifications and Blueprint approved by the European Commission.

3. Trust

TEMS will act as a neutral player for all media subsectors and stakeholders, and guarantee participant's identity.

- TEMS body will be a non-profit organisation: the central structure of TEMS as a Data Space is a non-profit organisation, which means that any profits it might generate would only benefit the overarching objectives of the Data Space and not be distributed among its members. Individual media participants of the Data Space may of course, however, exchange data and/or service offerings for profit, if they wish to do so.
- Identity and trust anchors: TEMS will guarantee participants' identity by connecting with relevant trust anchors.

4. Sovereignty

Each participant retains control over their data and sets up the access rules individually. TEMS will facilitate the creation and management of smart contracts.

- *Full Control Over Data: each participant retains sovereignty over their data, deciding how and with whom to share them.*
- *Governance to Protect Data Sovereignty: TEMS will provide observability tools to address any issues related to data sovereignty.*

5. Scalability and Portability

TEMS will be built on scalable infrastructure & services that allow the Data Space to grow, while limiting costs per participant. It should use portable offerings from tech and service providers to avoid vendor lock-in.

6. Transparency

Regarding governance, membership, onboarding conditions or rules of operation, rules are clearly defined and publicly available. Procedure to update rules are also clearly defined.

7. Fairness

On the governance side, all subsectors will be represented. There will be no domination by a single (or a small number of) actors. This point promotes equal opportunities for all participants to contribute to and benefit from the Data Space.

8. Openness

TEMS will be built to scale, allowing new participants to join easily, fostering the inclusion of diverse media subsectors. It will ensure that new participants, regardless of their size or sector, can easily join the Data Space.

- *There will be the same opportunities to share content, access services, and contribute to the data ecosystem for small and large companies, minor or more established media organisations, etc.*
- *Low entry barriers for participants: TEMS will provide tools and services for easy access to TEMS membership, in accordance with established and agreed rules.*
- *Scalability to accommodate new participants.*
- *Inclusion of diverse media subsectors.*

These 8 key pillars and the willingness to set up a sustainable business model for the data space itself are completely aligned with the Gaia-X vision.

b. Alignment of current architecture and technology stack with the Gaia-X technology model, and any convergence needs

TEMS and the different trials are currently evaluating the best technological basis amongst existing initiatives like Prometheus-X, Pontus-X, Fiware, etc. TEMS intends to rely on SIMPL when SIMPL open will be released, and TEMS expects that SIMPL will include the Gaia-X framework.

The primary goals of Gaia-X are to foster data sovereignty, ensure European competitiveness in the digital economy, and empower innovation across sectors. By enabling secure, cross-border data exchange, Gaia-X supports the development of Data Spaces in various fields. Through the interconnection of Data Spaces, Gaia-X aims to strengthen Europe's digital autonomy, reduce dependency on non-European cloud providers, and create a unified data infrastructure that fuels economic growth and technological

innovation across the continent.

TEMS builds on the Gaia-X initiative in several ways to achieve its goals to create a secure and trusted infrastructure, and the related supporting services that enable these.

Even if the technical solution is not yet chosen, the aim is to rely on the Gaia-X Compliance and its set of verifiable credentials and presentations to easily propagate trust and interoperability, depending on the next steps.

7. Use-case scaling

a. *Requirements and steps for a new member (user, provider, or service providers) to join use-case*

In order to join the use-case, a new member will have to accept the Terms and Conditions of the Tamis framework that will be compatible and derived from the Terms and Conditions of TEMS. Thus, a new member in the Tamis framework will automatically also be a new member in TEMS. The new member will have to obtain the mandatory verifiable credentials in adherence to the Trust Framework chosen by TEMS and TAMIS, but also fulfil the requirements linked with the Gaia-X Compliance.

The new member will have to connect with the Tamis' infrastructure either by implementing a compatible connector itself or by subscribing to one of the available "Tamis server" service.

The connection to the Tamis infrastructure will also enable the connection to TEMS.

b. *Other sectors that could benefit by making use of the resources in this usecase*

The "connector as a service" is a feature that could serve any other sector deploying a data space compatible with de facto standards. Furthermore, the "project private loop" implemented for the audiovisual stakeholders could be used by any other sector asking for confidential and private data exchange rooms.

The education sector could benefit from the Tamis use case to retrieve audiovisual material to support training. The language sector could also benefit from TAMIS to access quality content.

8. Next steps

a. *What are the next steps of your project functionally-speaking?*

For the use case mentioned in this testimonial, in the future, the workflow can be further optimised by replacing file-based exchanges with API integrations. This transition will enable real-time data processing instead of batch processing, significantly accelerating the overall workflow and further enhancing efficiency for all stakeholders involved.

In addition, TAMIS partners are actively developing other use cases that address different stages of the audiovisual work lifecycle. Notable examples include:

- **Collaboration between a production studio and a post-production company:** This use case focuses on improving the exchange of information during the manufacturing of a series intended for international distribution, ensuring streamlined workflows and enhanced interoperability.
- **Subtitle exchange between public broadcasters:** This use case involves two public broadcasters from different European countries trading subtitles for the same programme distributed in their respective territories, facilitating multilingual accessibility and reducing duplication of effort.

Based on existing implemented features, another future step will be to propose technical resources to simplify the deployment of new use cases within the audiovisual ecosystem and facilitate the seamless integration of existing services with the TEMS infrastructure, enabling faster adoption and innovation. Of course, in the next steps, TAMIS also intends to scale-up use cases by onboarding new participants (e.g. other collective management organisations).

b. How do these functionalities leverage the Gaia-X vision?

By enabling cross sector interoperability, the Gaia-X model could broaden the audience of each new service connecting to TAMIS/TEMS. Thus, service providers will have an interesting incentive to join TAMIS and TEMS.

c. What are the next steps of your project in relation to the current (and near-future) versions of the Gaia-X architecture, and/or Policy Rules Compliance Document, and/or [GXDCH](#) release?

After the release of the first implementation of the data space, TEMS will continue to look for all relevant components that could improve efficiency or ease new use cases developments.

At that point, TEMS expects to test and evaluate the recently published Loire release by Gaia-X , and that could be included in the TEMS architecture. Especially, the next steps will be to implement automated compliance tools.

Gaia-X

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