

# **TECH-X** Conference & **HACKATHON** #7

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#GaiaX #TechX24



# Gaia-X Hackathon Report

Results and Lessons from the Gaia-X Hackathon #7

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## Summary

The Gaia-X Hackathon #7 was part of the Tech-X 2024 conference, bringing the community to integrate further and use Gaia-X technologies. The event took place on-site and online, with at least one team leader required to be present in Luxembourg to coordinate team efforts.

Like the previous hackathon, this year's event awarded prizes to the top three teams based on their impact on the community, the adoption of Gaia-X, and the quality of their presentations. The Gaia-X Lab team was available on-site to assist participants and guide them through using the Gaia-X Trust Framework and the Gaia-X Digital Clearing House components.

## Hacking tracks

### [Advancing the LinkML-based CI infrastructure of WG Service Characteristics](#)

The main goal of this track was to improve the output of the Service Characteristics working group's ontology repository. This repository will provide the complete ontology for the 24.04 version of the documents for Gaia-X, including SHACL shapes, JSON-LD schemas and means to extend the ontology by the projects. The working group moved from manual shapes to using LinkML, a higher-level language to describe an ontology, and provided the tooling to generate the shapes, schemas, and ontology files.

During the hackathon, the team was able to push modifications to the LinkML repository to improve the experience of writing classes for the Gaia-X ontology when they contain fields with a string enumeration. They were also able to work on a mechanism to merge the output of the LinkML tools with some custom SHACL files to describe constraints that they were not able to express using LinkML directly.

**This track won the 3rd prize of the Hackathon.** Their presentation and detailed results are available on the [hackathon repository](#).

### [From data sharing initiative to data space](#)

The main goal of this track was to improve documentation and the onboarding process and examples for newcomers in the Gaia-X ecosystem. After some back and forth on their subject, the team decided to switch a bit by creating an onboarding API for participants in a dataspace.

During the hackathon, the team was able to provide a new API to remove the hassle from participants in a dataspace to have their own DID, their keypair by providing an endpoint that will take care of creating the Participant, the Legal Registration Number and the Terms and Conditions for the user with only a few information asked.

The team also created a server capable of storing and serving the DID and the credentials created by the API. The members expressed their satisfaction at the idea of reusing these components in their own projects after the event.

Their sources and presentation are available on the [GitLab repository](#)

### [Signing Credentials using vault instead of transferring private keys](#)

The goal of this track was to increase the security of the GXDCH components by making them sign and access cryptographic materials through the APIs of renowned secured storage instead of relying on the environment variables.

During the hackathon, the team was able to modify the RegistrationNumber Notary provided by the AISBL to allow it to sign credentials using either the environment variables, a HashiCorp Vault

or an Azure Vault. It's to note that there is no common interface or API between these two vaults, meaning that the team had to implement two different connectors.

The team reported that Hashicorp Vault was not able to sign all kinds of digest and required a JWT to be provided for signature.

### [Cloud federation with Gaia X for SME CSP's based on K8s and Liqo](#)

The goal of this track was to implement a real use-case of interconnecting two Cloud Service Providers (CSP) by allowing them to share their services on a catalogue and create a contract for their relationship. It also included the emission and validation of certification (eg ISO 27001) by an intermediary acting as a Conformity Assessment Body (CAB) itself or an accredited notary for said CAB.

During the hackathon, the team was able to complete all their tasks and show a demo of a CSP introducing its Kubernetes as a service offered in a catalogue. This offer was certified ISO 27001 for the needs of the demo. The team showed the emission of a VC representing the certification, as well as its usage when pushing the service in the catalogue.

They also demonstrated the customer side, by having a customer searching in the catalogue for a service, signing an agreement, some extended terms and conditions and finally getting the information to interconnect the Kubernetes cluster using Liqo.

The team used SHACL files to ensure the certification VC and contracts was conforming to the format they were expecting. They also extended the Gaia-X Terms & conditions model to fit their need in having specific clauses, for example, outage due to weather conditions.

The team did not provide yet their source code or report.

**This track won the first prize of the Hackathon.**

### [Gaia X LLM Integration for Enhanced Experience](#)

This track aimed to use Large Language Models (LLM) and Artificial Intelligence (AI) to improve catalogues by adding a natural language search to retrieve datasets.

Despite the quality of the data in the Credentials Events Service (CES) being very variable and mostly poor, the team was able to demonstrate during the hackathon that they were able to consume credentials, retrieve them and their description to train their model.

They were able to demonstrate the usage of a chatbot to qualify and interact with a set of data in a CSV format.

As mentioned previously, the quality of the data exposed via the CES, on production and development version is very poor. Most of the credentials are no longer valid, most of them are no longer resolvable either. That has complicated a lot the work of the team.

**This track won the second prize of the Hackathon.**

### OpenID-Wallet-Plugfest

This track was not led on-site, the jury got no information from the team leader and [the report on GitLab](#) is succinct.

The goal was to have multiple wallets, verifiers and issuers gather around and exchange credentials.

No more information is available.

## Conclusion

The Gaia-X Hackathon #7 has once again demonstrated the potential of collaborative innovation within the Gaia-X ecosystem. For two days, participants from diverse backgrounds came together to tackle challenges surrounding data sharing, interoperability, and digital trust. The event not only showcased the latest advancements in Gaia-X technologies but also highlighted the collaborative spirit and ingenuity of the tech community.

The projects developed during the hackathon provided valuable insights into the practical implementation of the Gaia-X Trust Framework and compliance validation mechanisms. These real-world applications validate the robustness and scalability of the Gaia-X architecture, paving the way for further strengthening the Gaia-X ecosystem. By bringing together developers, programmers, and business developers, the event facilitated the creation of a robust network of stakeholders committed to advancing the goals of Gaia-X as presented by the input of the Hackathon teams.