Supported by:

Federal Ministry
for Economic Affairs
and Climate Action

on the basis of a decision
by the German Bundestag

Gaia-X
FEDERATION SERVICES
GXFS

GXFS Toolbox – The Kickstarter for the Gaia-X Ecosystem

GXFS-DE Team
eco – Association of the Internet Industry

06.11.2023

Agenda

Gaia-X FEDERATION SERVICES GXFS

01 Gaia-X Federation Services Introduction

02 The XFSC Toolbox

03 Case Study: Servicemeister

04 Discussion and Q&A

Gaia-X
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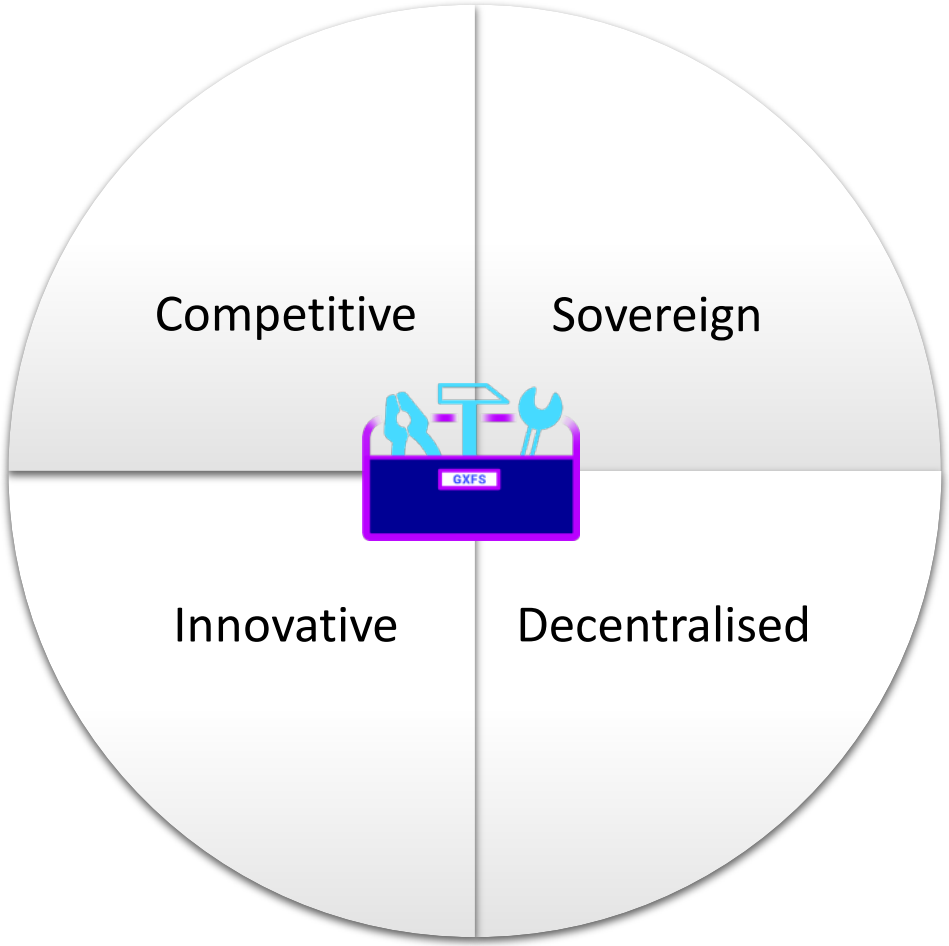
GXFS

01 Gaia-X Federation Services Introduction

Vivien Witt

Why do we need Gaia-X?



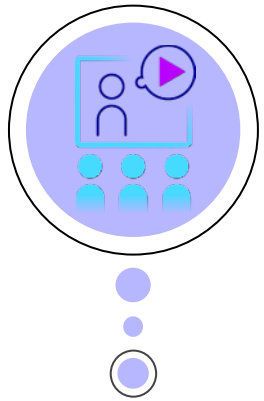
Gaia-X offers…

- Open Technology
- Minimum requirements for interoperability
- Standardised information on the compliance assessment
- Sovereign identity and trust mechanisms

Gaia-X: The Role of Federations

Gaia-X FEDERATION SERVICES GXFS

- Cooperation of organizations based on topics, domains, industries, etc.
- Participants work together at eye level towards common goals
- Federator for the operational startup of a federation
- GXFS basic services ensure interoperability

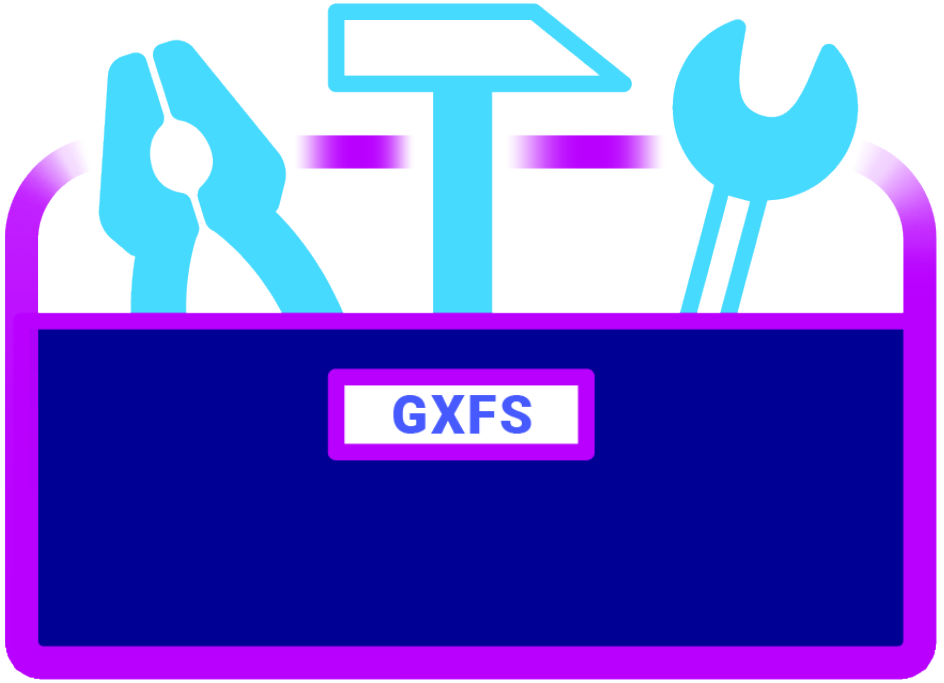


GXFS YouTube Playlist

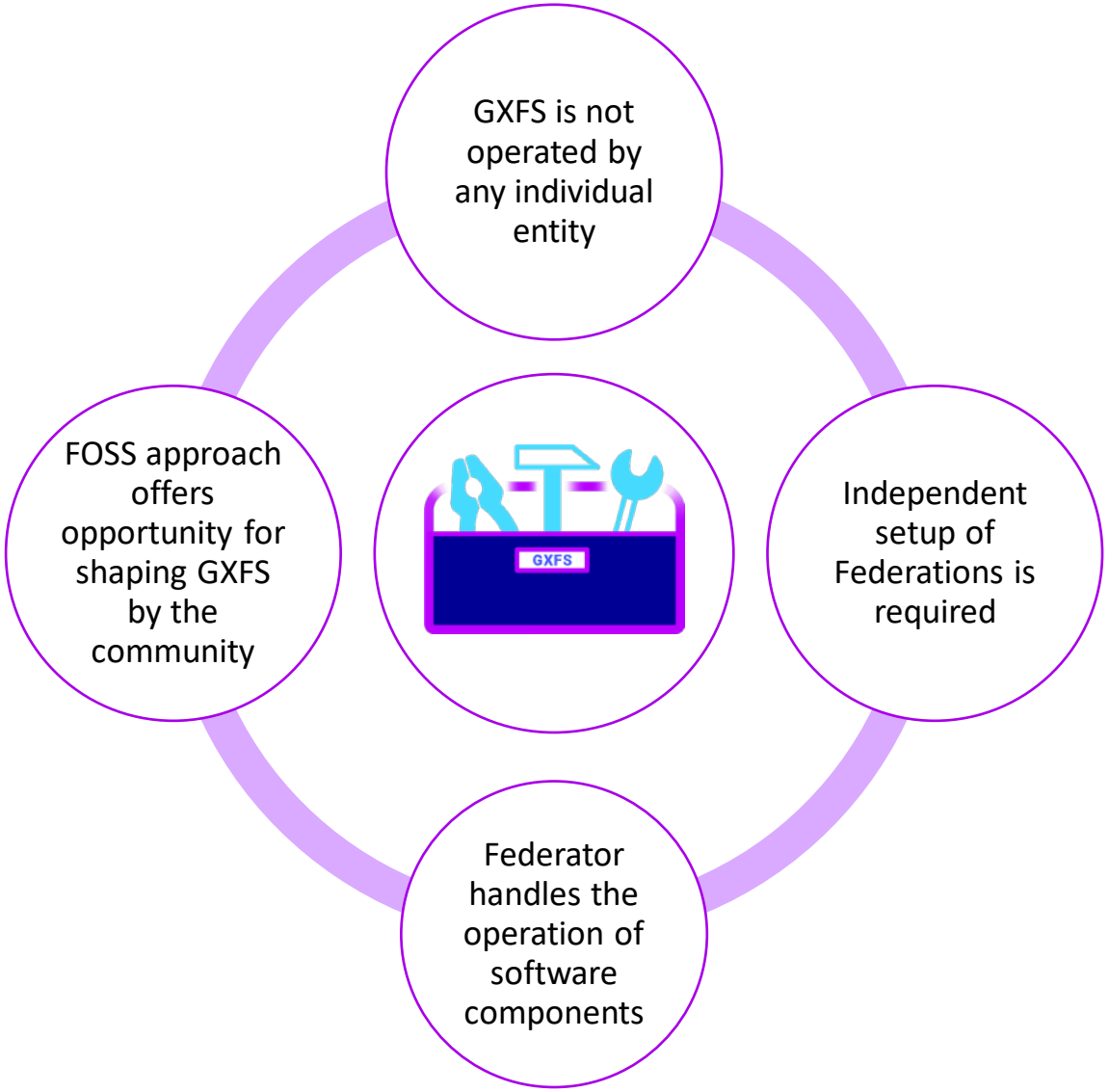
www.gxfs.eu/de/videos

What is GXFS?

„ The Gaia-X Federation Services (GXFS) provide a set of free and open-source software components that support the building of Gaia-X compliant federated ecosystems of infrastructure and data.”



GXFS – important facts



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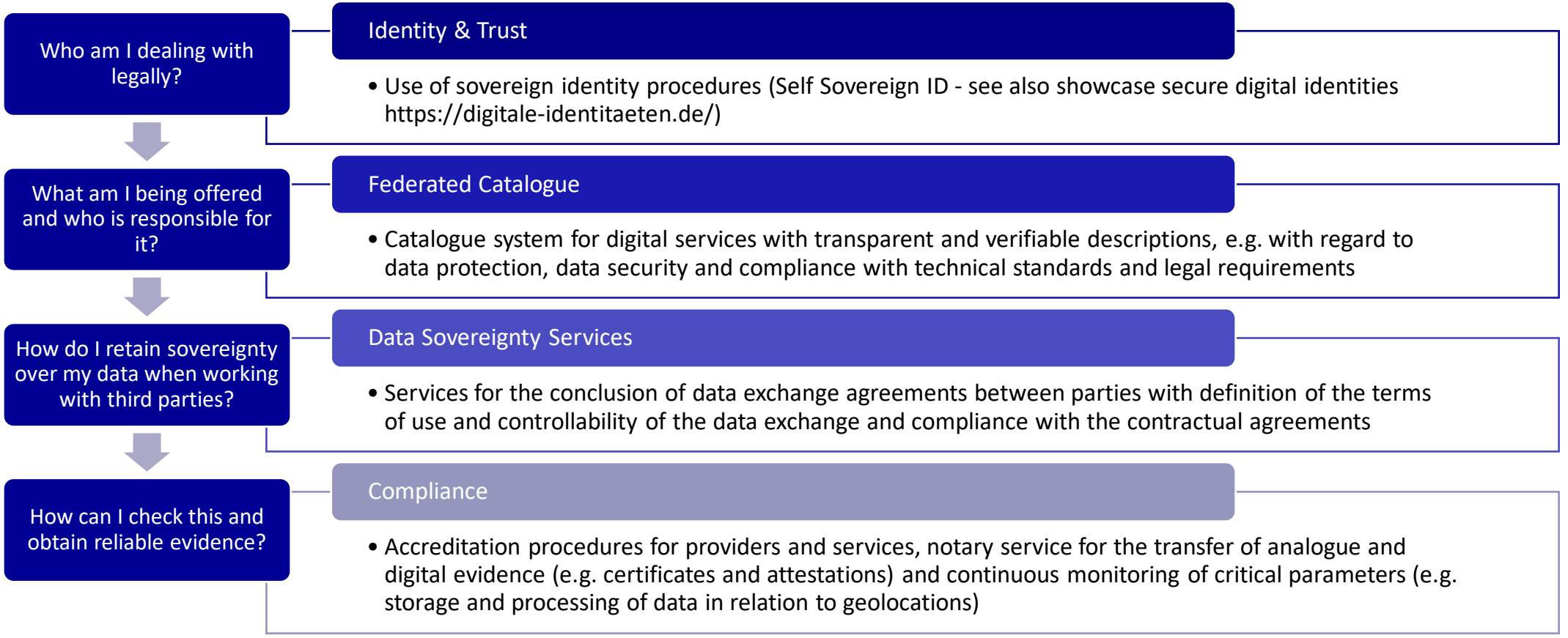
02 The XFSC Toolbox

Andreas Weiss

Federation Services Modell



A look into the XFSC toolbox

Gaia-X FEDERATION SERVICES GXFS

- Authenthication- & Authorisation
- Organisation Credential Manager
- Personal Credential Manager
- Trust Services
- Data Contract Service
- Data Exchange Logging

xfsc

GitLab

XFSC @ Eclipse Foundation

- Workflow Engine
- Continuous Automated Monitoring
- Notarisation Service
- Catalogue
- Portal
- Orchestration

GXFS Services: Identity & Trust

Authentication & Authorisation

- ✓ Request verifiable, decentralised and cryptographic credentials and identity attributes from other participants in a federation.
- ✓ Maintain control over what information is shared with others

Organisation Credential Manager

- ✓ Self-sovereign management of one's own credentials, e.g. identity documents, certificates or authorisations
- ✓ Maintain control over which credentials are used for authentication & authorisation purposes.
- ✓ Authenticate using a mobile app or browser application

Personal Credential Manager

- ✓ Configuring a self-determined and easy entry into a federation for companies by e.g. independently issuing and managing digital participation badges to employees
- ✓ Providing software services and data assets with a digitally verifiable seal
- ✓ Cryptographic creation of verifiable self-descriptions

Trust Services

- ✓ Enforce usage policies
- ✓ Establishing rule-based trust
- ✓ Ensuring chains of trust between multiple participants, organisations and authorities
- ✓ Establish trust anchors with verification standards such as W3C Verifiable Credentials/Presentations.

GXFS Services: Federated Catalogue

Federated Catalogue

- ✓ Search and select providers and their service offerings in a federation based on self-descriptions.
- ✓ Monitoring relevant changes in service provision

Self-Descriptions

- ✓ Creation wizard: Create valid self-descriptions (claims) using interactive web forms.
- ✓ Visualisation tool: Visualise created self-descriptions
- ✓ Validation wizard: Validate the created self-descriptions (claims), e.g. check whether data types are correct and all mandatory information is present.

GXFS Services: Sovereign Data Exchange

Data Contract Service

- ✓ Obtain legally binding consent between data provider and data user for data access, exchange and use.
- ✓ Cryptographic signing of a data contract
- ✓ Subsequent provision of the signed contract

Data Exchange Logging Services

- ✓ Track whether data has been transmitted and received
- ✓ Track whether data usage policies have been respected or violated, e.g. to resolve operational issues or detect fraudulent transactions.
- ✓ Create an auditable transaction log that is only accessible to the contracting parties.

GXFS Services: Compliance

Onboarding and Accreditation Workflow

- ✓ Support the implementation of a validation process for participants, resources and service provision prior to inclusion in a federation's catalogue.
- ✓ Document the validation process and create an audit trail to ensure compliance with generally accepted practices in conformity assessment.

Continuous Automated Monitoring

- ✓ Continuous automated rule compliance monitoring based on self-descriptions in a federation's catalogue
- ✓ Monitoring according to the ENISA EUCS Cloud Services Scheme | "High" test level

Notarisation Service

- ✓ Issue a verifiable credential following successful validation of a participant to confirm status as a registered participant in a federation
- ✓ Processing notarial requests and issuing digital, legally binding and trustworthy certifications

GXFS Services: Portal & Integration

Portal

- ✓ Operation of a business web client for each federation
- ✓ Integrate the individual Federation services such as:
  - ✓ Search and filter function to query federation databases
  - ✓ Display of search results for services and data within a federation
  - ✓ Member account with profile management to create and edit self-descriptions, organisational data and login history, among other things.
  - ✓ Manage credentials
  - ✓ Adding and authorising new members of a federation
  - ✓ Dashboard with overview of all active and inactive services, status of booked services and history of used services

Orchestration

- ✓ Instantiation of selected services from the catalogue, in particular IaaS offerings such as compute and/or storage and installation of applications within the selected infrastructure
- ✓ Use of Provider APIs for the IaaS Lifecycle
- ✓ Updating applications to e.g. The latest version

Implementation Phase 2

- Main Objectives:
  - Harmonize with revised architectural concepts
  - Adapt the existing services to general technological developments
  - Take conceptual changes from the Gaia-X community into account
- Implementation partners will work in the Eclipse XFSC code repository
- Changes/Extensions summary: https://gitlab.eclipse.org/eclipse/xfsc/xfsc-spec-2
- Winning Bidders:
  - Trust Management Infrastructure (TRAIN): T-Systems International
  - OCM Extension: T-Systems International
  - OCM W-Stack: T-Systems International
  - TSA Extension: Vereign
  - NOT Extension: ecsec
  - PCM Extension & Cloud: T-Systems International

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03 Case Study: Servicemeister

Hauke Timmermann

SERVICE MEISTER

AN AI-BASED SERVICE ECOSYSTEM FOR TECHNICAL SERVICES IN THE AGE OF INDUSTRY 4.0

Supported by:

Federal Ministry
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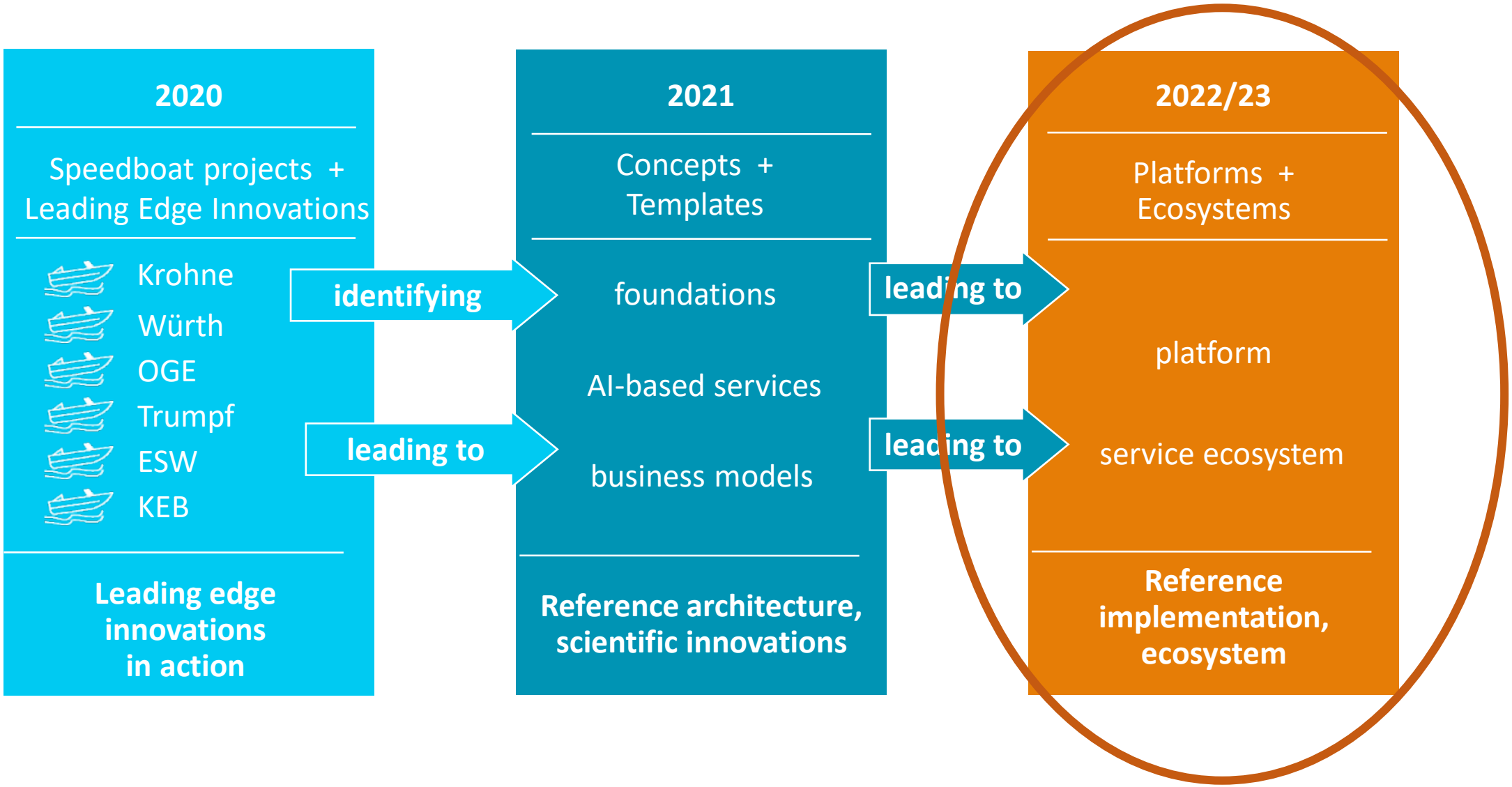
on the basis of a decision
by the German Bundestag

FUNDING PROGRAMME: "BMWI AI INNOVATION COMPETITION"

PROJECT PLAN – START IN THE FIELD



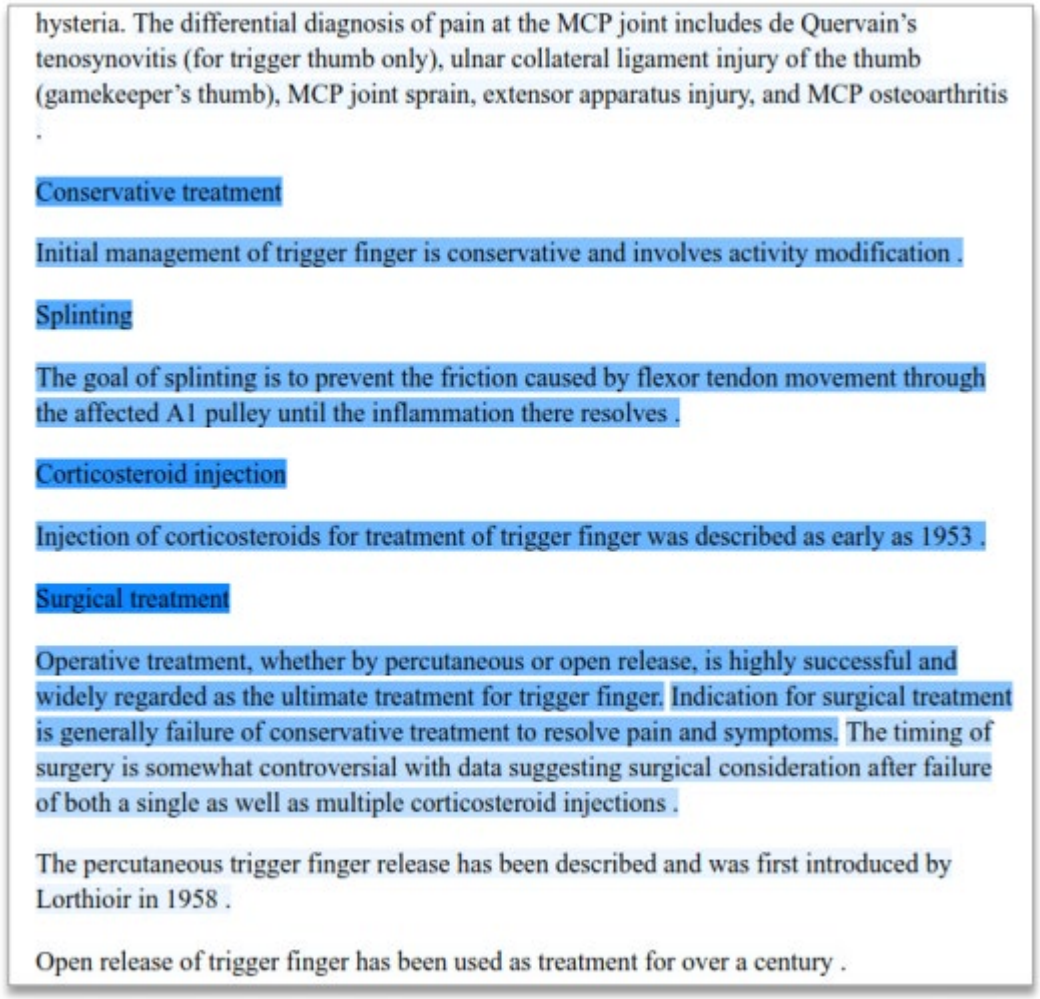
100% DIGITAL SERVICE LIFE CYCLE

Common approach

1. Predictive analytics
2. AI-assisted ticket production
3. AI-assisted case clarification
4. On-site: service chatbot
5. AI-assisted service reports,
6. AI-based reports and feedback loop

Standardisation, AI building

MACHINE READING AND RECOGNITION OF CONTEXT



hysteria. The differential diagnosis of pain at the MCP joint includes de Quervain's tenosynovitis (for trigger thumb only), ulnar collateral ligament injury of the thumb (gamekeeper's thumb), MCP joint sprain, extensor apparatus injury, and MCP osteoarthritis .

Conservative treatment

Initial management of trigger finger is conservative and involves activity modification .

Splinting

The goal of splinting is to prevent the friction caused by flexor tendon movement through the affected A1 pulley until the inflammation there resolves .

Corticosteroid injection

Injection of corticosteroids for treatment of trigger finger was described as early as 1953 .

Surgical treatment

Operative treatment, whether by percutaneous or open release, is highly successful and widely regarded as the ultimate treatment for trigger finger. Indication for surgical treatment is generally failure of conservative treatment to resolve pain and symptoms. The timing of surgery is somewhat controversial with data suggesting surgical consideration after failure of both a single as well as multiple corticosteroid injections .

The percutaneous trigger finger release has been described and was first introduced by Lorthioir in 1958 .

Open release of trigger finger has been used as treatment for over a century .

- Finding and identifying units of meaning in continuous text
- E.g., Symptoms and Derived Diagnosis or Therapy
- SECTOR searches texts from Wikipedia and PubMed
- SECTOR can be applied to clinical studies and doctors' letters
- Transfer can take place through application to machines, as the logic of diagnosis and therapy behaves similarly here
- The data is also available in text form

SPEEDBOAT PROJECTS – WHAT ARE THEY?

SERVICE MEISTER

KROHNE measure the facts
inovex

NLP and anomaly detection in wastewater management

TRUMPF
USU

Machine monitoring and diagnosis

WÜRTH
grand centrix

Connectivity and AI for power tools

inovex
esw GROUP Beste Verbindungen
BHT Berliner Hochschule für Technik

Error detection in automotive production

OCE
USU

Remote monitoring and anomaly detection

KEB
USU

Recommended engines and chatbots in service

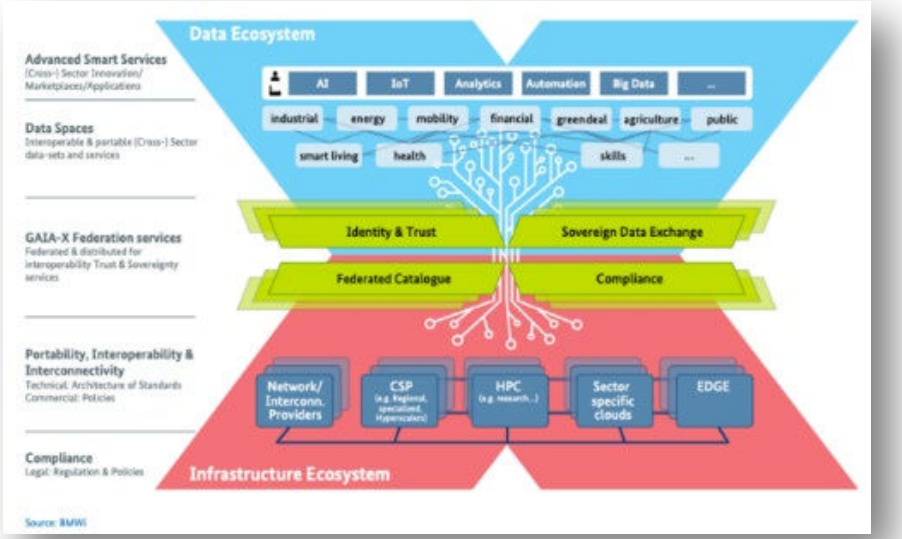
AN AI-BASED SERVICE ECOSYSTEM FOR INDUSTRY 4.0

SERVICE MEISTER

Service life cycle for different industries and company sizes

Platform concept

Gaia-X as the ecosystem for AI and decentralised data processing



Gefördert durch:
Bundesministerium für Wirtschaft und Energie
aufgrund eines Beschlusses des Deutschen Bundestages

Service-Meister Gaia-X Demo

An AI-based Service Ecosystem for Technical Service in the Age of Industry 4.0

Search for service offerings

https://servicemeister.pontus-x.eu/

AutoTiM

COMPUTE | ALGORITHM | AT-APP

AutoTiM Machine Learning Application

0x4Dda...F8bE

This service provides the sample AutoTiM machine learning application developed as pa...

COMPUTE | DATASET | AT-5

AutoTiM - Articulary Word Recognition

0x4Dda...F8bE

This data service provides a sample data service (from a series of sample services) for ...

COMPUTE | DATASET | AT-4

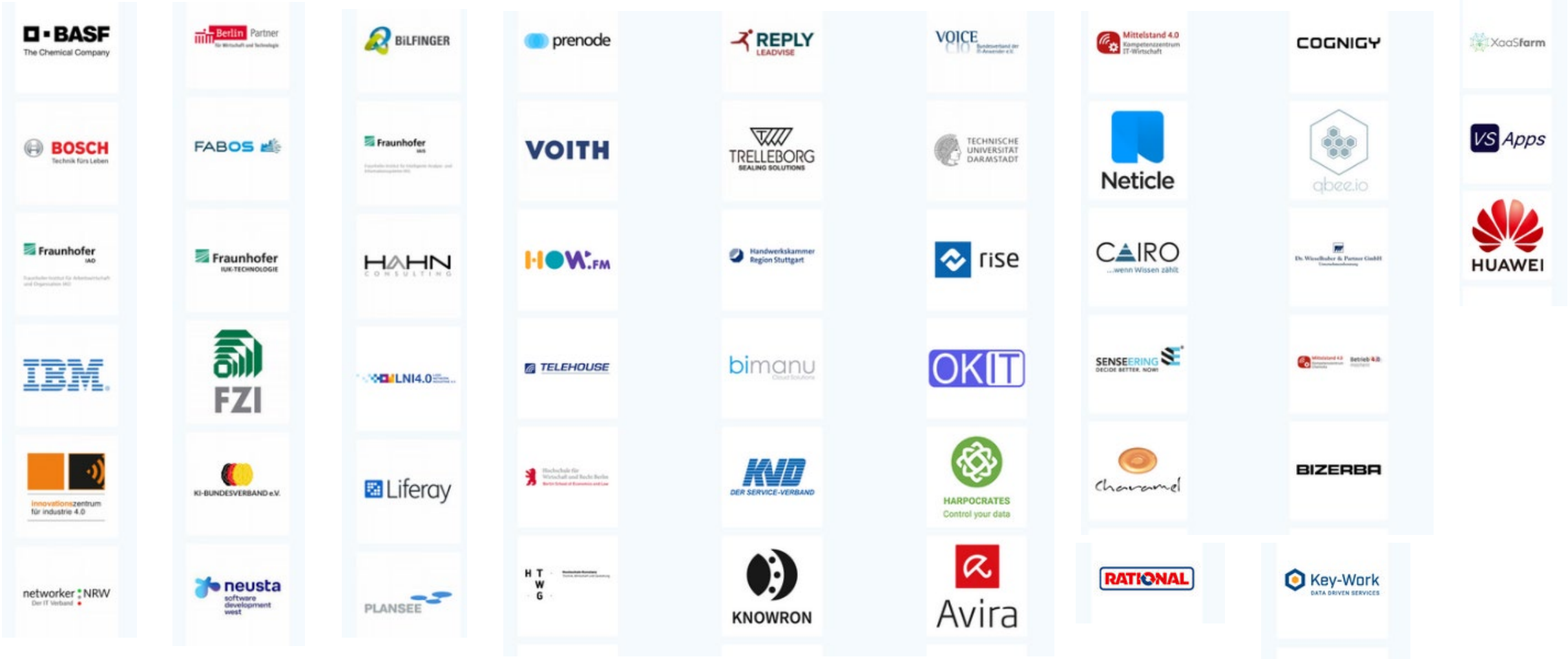
AutoTiM - Basic Motion

0x4Dda...F8bE

This data service provides a sample dat service (from a series of sample service

STRONG PARTNER NETWORK

SERVICE MEISTER



THANK YOU UND LET'S CONNECT

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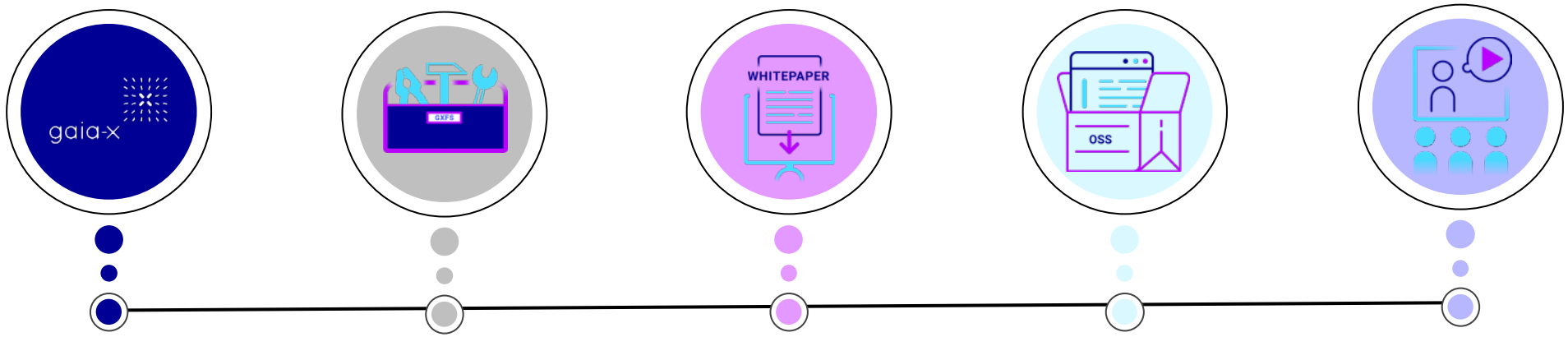
04 Discussion and Q&A

Join the GXFS Community!

Additional Resources



Gaia-X
Website
www.gaia-x.eu

GXFS
Website
www.gxfs.eu

Whitepaper
GXFS Whitepaper
www.gxfs.eu/de/downloads

GitLab
XFSC Toolbox
gitlab.eclipse.org/eclipse/xfsc

Videos
GXFS Videos
www.gxfs.eu/de/videos