Pre-PAI Deliverable D2.1 – Stakeholders' requirements	
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ABSTRACT

D.2.1 "stakeholders' requirements" provides a detailed analysis of the needs of the different stakeholders expected to use the AI-on-Demand platform: SMEs and large industries, public bodies, Testing and Experimentation Facilities (TEFs), and (European) Digital Innovation Hubs ((E)DIHs). Through a detailed questionnaire adapted to the type and AI maturity of the stakeholders, interviews, focus groups and literature reviews, these deliverable details the functionalities and infrastructures required by the stakeholders in the AI-on-Demand platform, as well as recommendations for their implementation.

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1 EXECUTIVE SUMMARY

To support broad uptake of the AI-on-Demand (AIoD) platform, the needs and requirements of stakeholders must be understood and prioritized. This was the task assigned to Work Package 2, a key work-package for Pre-PAI (29% of the PMs in the project involving half of the partners). These needs are presented in this deliverable D2.1 “stakeholders’ requirements”; they are also compared with the existing functionalities in the current AIoD platform to produce a gap analysis described in D2.2, which would serve as the basis for a roadmap to adapt the AIoD platform to stakeholders’ needs. Results of WP2 feed into all the other WPs in Pre-PAI.

We identified three groups of stakeholders: SMEs and large Industries, public bodies, TEFs & DIHs. WP2’s members decided to adopt a direct method to collect requirements: **ask stakeholders** their opinions through a survey with questions broader than just AI-on-Demand functionalities, including as well other functionalities deemed of interest to the partners. A questionnaire was thus designed and ported to a survey tool (limesurvey), with some adaptation across the three stakeholders’ groups. The survey was disseminated among consortium networks and also filled-out through interviews and workshops. We obtained **281 complete responses** for all the questionnaires. One of the parts in the questionnaire was about the respondent's **AI maturity level**, our assumption being that respondents with different levels of AI maturity would have different requirements: we thus defined two categories “AI aware” and “AI unaware” stakeholders. We had nine families of functionalities in the questionnaire: contacts, content, data, training, services, funding programs, jobs, events and technical tools. The main results obtained are as follows:

For SMEs and large industries, we found 64% AI aware and 36% AI unaware. Requirements usually differ between these two groups: AI unawares mostly want contacts with solution providers, success stories and best practices, basic training, coaching services, support with data; AI awares are interested in all functionalities listed for contacts (except service providers), contents (except regular press data), training facilities, services especially around trustworthiness of AI solutions and regulation, funding sources, events, technical tools or access to infrastructures. Functionalities around jobs were not found relevant by either group.

For public bodies, we found 33% AI aware and 67% AI unaware (the public sector still lags behind in AI maturity). More than half respondents (51%) declare they do not have an AI activity (60% at local level). Their requirements are : for contacts, solutions providers fitted to their needs or forums for AI unawares and with researchers and TEFs for AI awares; for content, access to best practices, guideline documents, and success stories for both AI awares and unawares; for services, training, ethical services, support for data for both, with coaching services and guidelines to assess the trustworthiness of AI solutions in addition for AI unawares; for training, best practices for learning AI skills and basic AI modules for both, with training on trustworthy AI in addition for AI awares; for data and technical tools, AI awares are interested in all functionalities listed. Information about jobs or events is not considered a priority for the public sector.

For TEFs and DIHs (3 and 61 responses), we found 100% and 66% AI aware and 0% and 34% AI unaware. TEFs are interested in contacts with AI solutions providers, like-minded companies, networking opportunities to find funding and sponsors; access to success stories, best practices and guidelines, AI prototypes, cost examples, feasibility frameworks & QA methodologies, access to all data and data sharing initiatives, services for AI model quality assessment, legal & ethical, GDPR, AI-act and test-at-scale assistance, access to all types of technical tools, as well as features such as content search. DIHs are interested in getting connections with other DIHs, AI awares and unawares differ mainly in the higher interest of AI awares to be introduced to researchers and TEFs, while AI unawares show more interest in access to AI solution providers; for content, they want real examples; access to data is a main challenge. They are interested in promoting their services through the AIoD platform.

A dedicated section on **infrastructure** (HPC, Cloud and edge) showed that access to infrastructure solutions is perceived as important and the AIoD platform should make such access easily available, both for training and inference. When providing infrastructure, the following factors are important: security aspects, cost and cost model, assistance for selecting tools and set-up across the edge, cloud, HPC continuum, cost and talent barriers being the most significant for smaller SMEs.

An additional questionnaire on **Generative AI** was issued, following a request by the EC. Only 17 complete responses from SMEs & large industries and 2 responses from public bodies were received. The results showed considerable interest in Generative AI, with 9 out of 17 companies and all public bodies having already adopted such solutions. Most uses are for AI-generated textual content, or software development. Most expected outcome is time saving, especially for public bodies. The need for infrastructure support is expressed by respondents.

As a summary, the survey of stakeholders' needs has thus shown that most functionalities proposed, in addition to those already present on the AIoD platform, are considered necessary by some or other segment of stakeholders. Being able to provide the relevant ones to each segment will have to be considered in the future AIoD platform.

2 LIST OF ABBREVIATIONS

Abbreviations	Definition
AIoD platform	AI-on-Demand platform
(E)DIHs	(European) Digital Innovation Hubs
CCM	Computing Continuum Management
CEI	Cloud, Edge and IoT
CPU	Central Processing Unit
DVC	Data Version Control
EESC	European Economic and Social Committee
eIDAS	electronic IDentification, Authentication and trust Services
GDPR	General Data Protection Regulation
GPU	Graphics Processing Unit
GUI	Graphical User Interface
HPC	High Performance Computing
JRC	Joint Research Center
JTC	Joint Technical Committee
OOTS	Once-Only Technical System
PA	Public Administration
PCP	Pre-Commercial Procurement

QA	Quality Assurance
ROS	Robot Operating System
SDO	Standards Development Organisation
SMEs	Small and Medium-sized Enterprises
TEFs	Testing and Experimentation Facilities
TIF	Technology Innovation Fund
VC	Venture Capitalist
WP	Work Package

3 INTRODUCTION

3.1 Context and overview

The Pre-PAI project seeks to provide a blueprint for the further development of the European AI-on-Demand platform. This blueprint is built on three expected Outcomes:

- Outcome 1 (OC1): Roadmap to deploy AI made in Europe, focusing on the requirements and needs of stakeholder groups, requirements for trustworthiness, and technical specifications.
- Outcome 2 (OC2): Gap analysis of AI resources for stakeholders (SMEs, public administration, and large industry).
- Outcome 3 (OC3): Recommendations for the long-term sustainability for the AI-on-Demand platform, including legal aspects, comprehensive business, and governance model.

To optimize the future development of the AI-on-Demand platform, Pre-PAI's ambition is to give a blueprint tailored to the expectations and requirements from the platform's current and expected users. The collection of these elements is carried out in the framework of Work Package 2.

Work Package 2 "Stakeholder Consultation and Workshops" is a key work-package for Pre-PAI, representing 29% of the PM distribution of the project and involving half of the partners. OC1 and OC2 will be driven by the outputs from WP2. To ensure the quality of both OC1 and OC2, WP2 has to deliver a comprehensive stakeholder analysis by collecting requirements and needs from four types of stakeholders: SMEs, public administrations, TEFs and DIHs and large industries and then provide a gap analysis of the stakeholders' needs and the existing tools on the European AI-on-Demand platform.

To do so, WP2 is composed of 5 tasks:

- T2.1 Methodology and coordination, led by HFIA
- T2.2 SMEs and large industry, led by DSME
- T2.3 Public Sector /w Gap analysis, led by INT
- T2.4 TEFs and DIHs, led by FBC
- T2.5 HPC, Cloud, Edge, led by TEL.

3.2 Alignment with other Pre-PAI work packages

The proper functioning of the project requires close cooperation between Work Package 2 and all other Pre-PAI work packages. WP2's needs collection and consolidation will contribute to WP3 by providing aspects on ethics and governance, to WP4 with inputs on sustainability and to WP5 with the useful functionalities expected from the stakeholders.

Together with WP3 and WP5, results from WP2 will be validated and finalized by WP1 to deliver the final Outcome 1 (D.1.2: Final roadmap and plan).

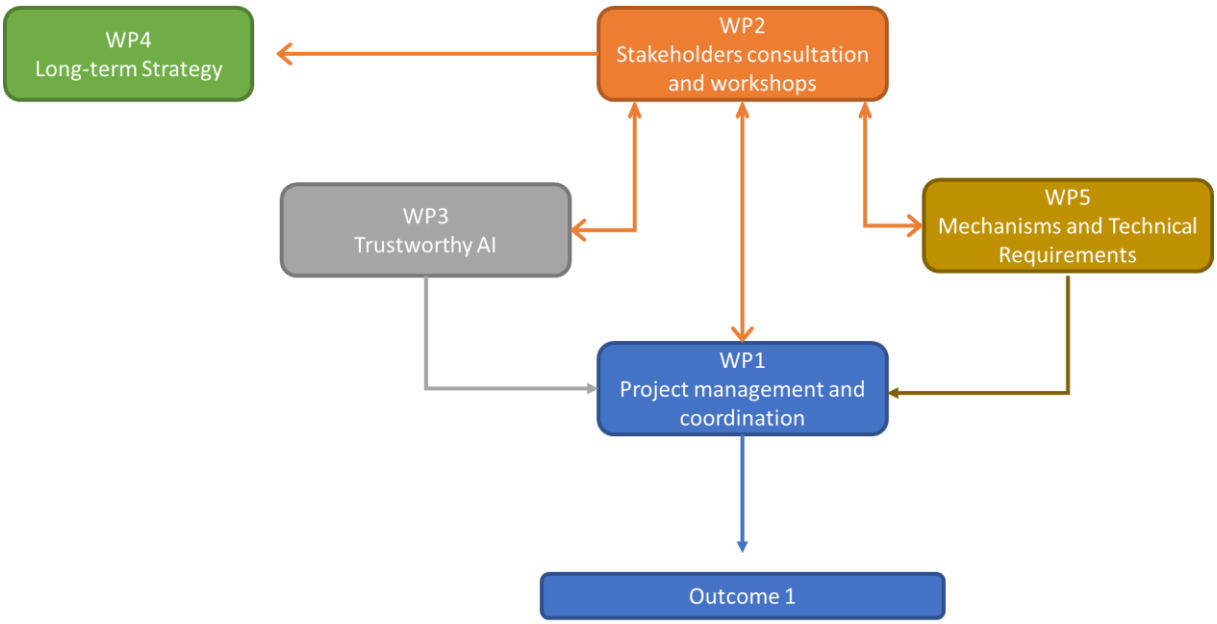


Figure 1 - representation of links between WP2 and other work packages of the Pre-PAI project

To ensure that the work carried out between the different work packages is consistent and that the project gets off to a good start, Work Packages leaders organized extraordinary meetings between Work Packages 2 and 5, and Work Packages 2 and 4.

On a monthly basis, proper communication was ensured with other work packages through the Work package Leader/Task Leader meeting organized by WP1.

As WP5 requires specific data from stakeholders in order to create a list of technical requirements for AI tools and their interoperability, Task 5.1 provided a set of questions to integrate to the stakeholders' consultation and workshop carried out by WP2. Both Work packages worked together to identify the AI maturity and infrastructure knowledge level associated with each question, and thus identify to which type of respondent the questions should be displayed.

Then, WP2 integrated these questions into the survey with the appropriate display mechanism.

4 METHODOLOGY AND COORDINATION

4.1 Introduction and context

WP2 is tasked to collect and consolidate the requirements and needs for the AI-on-Demand platform of the various stakeholders' communities and provide a gap analysis between these requirements and the functionalities presently available on the platform.

WP2 respects the GDPR regulation when collecting personal data in the process of interviews, workshops and surveys.

WP2 is organized in five tasks, to cover the three groups of stakeholders (SMEs and large Industries, public bodies, TEFs & DIHs).

- Task 2.1 – Methodology and coordination
  - Definition of a common methodology (how to identify stakeholders, how to contact them and what to ask them) so that all tasks are aligned to produce a coherent analysis
  - Leader: Hub France IA
  - Participants: DIGITAL SME, Università di Bologna, Intellera Consulting, SAP, FundingBox, Telenor, Stichting EGI
- T2.2 – SMEs and large Industries
  - Contact SMEs (non-AI technical, but potential users of AI on the buying side of the marketplace), AI Solution providers and large industries and collect their requirements
  - Leader: DIGITAL SME
  - Participants: Hub France IA, Università di Bologna, SAP
- T2.3 – Public bodies
  - Contact public administrations and gather their requirements
  - Leader: Intellera Consulting
  - Participants: SAP
- T2.4 – TEFs & DIHs
  - Contact TEFs & DIHs and gather their requirements
  - Leader: FundingBox
  - Participants: Intellera Consulting, NCSR Demokritos
- T2.5 – HPC, Cloud and Edge
  - Identify the HPC, Cloud and Edge requirements and gaps
  - Leader: Telenor
  - Participants: Stichting EGI

4.2 Common methodology

4.2.1 Methods of consultation with stakeholders

The WP2 Partners discussed about the method to elicit requirements from stakeholders. It was recognized that directly asking targeted questions would bring the most accurate information. We thus decided to design a questionnaire to specify these questions: it was agreed to ask questions encompassing AI-on-Demand functionalities, but also including as well other functionalities which seemed of interest to the partners. In this respect, questions were included at the request of WP3 (for instance on trustworthiness) and WP5 (for instance with certain questions relating to technical tools), the results of which were used as input for their own work. Then WP2 Partners discussed the structure of the questionnaire and its content, until full agreement was reached. The questionnaire was then ported to a survey tool (limesurvey) which was selected to support the complexity of our questionnaire (scoring, logical jumps depending on scoring, question branching, as well as semi-automatic translation), data hosting in Europe and automatic consolidation of answers.

WP2 partners then received a link to the questionnaire together with a standard email template they could use for the dissemination of the questionnaire. They identified their own list of stakeholder contacts, divided across the 3 types of stakeholders, and sent out a first wave of questionnaires on 24/01/2023, with the corresponding questionnaire version.

Following the first wave of responses from stakeholders across the EU, a pre-analysis of the results was conducted in early February. Several reminders were further sent out after that first wave of responses.

Pre-PAI partners outside of WP2 were also asked to help distribute the questionnaire to their respective contact lists, with the goal of obtaining a sample of answers from all EU countries, while making sure that we knew to whom the questionnaire was sent (to avoid spam).

Following the European Commission's review on 31/03/2023, two new open-format questionnaires were created for SMEs and large industries, as well as for public bodies, integrating specific questions on Generative AI.

A set of questions on Generative AI (see chapter 10.5) has also been added to these questionnaires, in response to the expectations expressed by the European Commission during the review.

These questionnaires were distributed again in mid-May by the Pre-PAI partners and were also distributed to the EC contact lists (AI Alliance, AI excellence centers, AI Data and Robotics Partnership).

The questionnaire was also filled-out through interviews, workshops or focus groups.

All the results were then frozen on 19/06/2023 for analysis, compilation and integration into this deliverable.

In total, we received and analyzed **281 complete responses** for all the questionnaires.

4.2.2 Shared questionnaire

We designed a questionnaire to cover the information required to elicit the requirements of stakeholders. Most of the questionnaire is common to the three groups of stakeholders, with some adaptations when needed. It is divided into the following sections (see chapter 10.5 for screenshots). Questions are not open-ended but include lists of answers which allow for easy consolidation of answers (a functionality offered by the survey tool).

The structure of the questionnaire is as follows and is described in more details below:

- Welcome page
- General information page
- Organization information page
- AI maturity assessment
- Useful functionalities
  - Contacts questions
  - Content questions
  - Data questions (only for AI aware stakeholders)
  - Training questions
  - Services questions
  - Funding programs questions
  - Jobs questions
  - Events questions
  - Technical tools questions (only for AI aware stakeholders)
- End page

4.2.2.1 Welcome page

Note: this page is identical for the 3 versions (SMEs and large industries, public bodies and TEFs and DIHs).

This is the landing page of the questionnaire in which are displayed:

- a language selector which allows the selection of the different languages available for the questionnaire (translations made by the WP2 Partners and applied to the questionnaire);
- a welcome message;
- a privacy policy message to collect the respondent's consent (necessary to proceed).

4.2.2.2 General information page

Note: this page is identical for the 3 versions SMEs and large industries, public bodies and TEFs and DIHs.

This page asked the following mandatory questions:

- which Pre-PAI project partner invited the respondent to take the survey. This element allows to optimize the analysis of the results and for WP2 Partners to measure the progress of their questionnaire distribution targets;

- in which format the stakeholder responded to the questionnaire. 3 formats are possible (see the detailed number of respondents in the "targets" section for each type of stakeholder):
- face-to-face meeting (offline): the stakeholder answered the questionnaire live during an offline face-to-face interview with a WP2 partner to guide them through the survey;
- online meeting: the stakeholder answered the questionnaire live during an online face-to-face interview with a WP2 partner to guide them through the survey;
- autonomously: the stakeholder completed the questionnaire autonomously without assistance.

4.2.2.3 Company information page

Note: this page contains some minor variations between the 3 versions.

This page asked the following mandatory questions:

- the type of organization (SME, startup, large Industry, public body, TEF, DIH)
- the domain
- the size of the organization
- if the respondent has an AI activity
- the role of the respondent in their company/organization
- the respondent's country

4.2.2.4 AI maturity assessment page

Note: this page contains some minor variations between the 3 versions.

This page is a key part of the questionnaire. It allows to qualify the respondent's AI maturity level, based on its responses. Our assumption here was that companies with different levels of AI maturity would have different requirements.

The assessment, inspired from the AI Readiness Index also used in GPAI[1], is divided into 12 questions, each with a predefined list of 4 answers, with different weights, to calculate a total AI Maturity score.

The respondent's AI maturity will be divided into 2 levels (out of a maximum of 48 points: 12 questions multiplied by a maximum of 4 points per question):

- AI aware (AI Maturity score > 24 points)
- AI unaware (AI Maturity score <= 24 points)

The AI maturity level of the respondent will determine which variant will be displayed in the next *Useful Functionalities* section:

- Section A: AI aware questions
- Section B: AI unaware questions
- Section C: AI aware questions with specific questions on HPC, Cloud and Edge infrastructures (WP2 / T2.5);
- Section D: AI unaware questions with specific questions on HPC, Cloud and Edge infrastructures (WP2 / T2.5).

4.2.2.5 Useful functionalities page

Note: this page contains significant variations between the 3 versions to include more relevant functionalities for each type of stakeholder.

[1] https://aisingapore.org/innovation/airi/, https://www.gpai.ai/projects/innovation-and-commercialization/broad-adoption-of-ai-by-smes/

This page represents the core of the questionnaire and is the main source of stakeholders' requirements.

Since this page contains a large number of questions and the respondent may not have the necessary knowledge required to answer all the questions across their organization, partners decided to make all the questions on this page optional.

We preferred to have partial questionnaires submitted (with unanswered optional questions), rather than dropouts, with not submitted questionnaire.

Depending on the answers to the AI Maturity Assessment described above, only one of the 4 variants of this section is displayed. Complex technical questions should not be asked to stakeholders with no AI maturity.

Therefore, there are 2 variations of the page title, depending on the respondent's AI Maturity level:

AI aware title

” You are AI ready, which means that you are certainly able to:

- develop customized AI solutions for specific business needs;
- develop a roadmap for AI implementation;
- develop customized AI model for unique business needs.”

AI unaware title

” You are AI unaware, which means that you probably:

- have heard about AI but are unaware of its applications or unable to identify use cases for AI applications
- wait for AI providers to convince you about use cases and business value of AI or have identified potential use cases and seek AI solutions from AI providers
- consume ready-made, end-to-end AI solutions”

The questions on this page are divided into **functionality categories**, containing several sub-questions. Each sub-question is intended to measure the importance for the respondent to benefit from this functionality in the future platform. Questions always propose a list of potential answers (no open question) to allow for easy consolidation of all questionnaires.

Here are the different categories of functionalities proposed on this page which are covered for each stakeholder:

- contacts: various types of contacts the stakeholder might be interested in;
- content: various types of content the stakeholder might be interested in;
- data (only displayed for AI aware respondents): various types of functionalities to deal with data, the stakeholder might be interested in;
- training: various types of trainings the stakeholder might be interested in;
- services: various types of services the stakeholder might be interested in;
- funding programs: various sources of funding the stakeholder might be interested in;
- jobs: various types of job services the stakeholder might be interested in;
- events: various types of events the stakeholder might be interested in;
- technical tools: various types of technical functionalities, algorithms, tools, etc. the stakeholder might be interested in (displayed only for AI aware respondents, with the subset T2.5 questions only displayed for AI aware respondents who have chosen the associated answers in the AI Maturity assessment).

4.2.2.6 End page

Note: this page is identical for the 3 versions SMEs and large industries, public bodies and TEFs and DIHs.

This is the end of the questionnaire.

There are only 2 optional questions:

- the respondent is asked to share any additional comments;
- the respondent is asked to provide their email address, if they would like to have access to the survey results and be invited to the webinar presenting the conclusions. This information is optional in case the respondent wants to remain anonymous.

Then, the respondent may ”submit” the questionnaire and their answers will be received by WP2 for consolidation and analysis.

5 SMES AND LARGE INDUSTRIES

5.1 Introduction and context

An important target group of the European AI-on-Demand platform is represented by industry stakeholders, both large industry actors and SMEs. They increasingly recognize the potential of AI to drive their businesses forward. The ability to utilize AI tools for decision making and business development is critical for companies seeking to thrive in a competitive business environment. AI-driven insights provide data-driven decision-making capabilities, enhance accuracy and efficiency, enable predictive capabilities, offer a competitive advantage, personalize customer experiences, and unlock new opportunities. However, the adoption of AI technologies can be challenging due to factors such as high costs, lack of expertise, and complex implementation processes. The European AI-on-Demand platform holds significant promise for bridging these gaps by providing accessible and tailored AI solutions.

In the first part of this chapter, the focus is on presenting the findings of the survey disseminated among consortium networks. This survey aimed to gather insights from both **AI-aware** and **AI-unaware companies**, providing a comprehensive understanding of their needs and requirements for a European AI-on-Demand platform. AI-aware companies (see chapter 4.2.2.4 for definition of AI maturity assessment) are those already familiar with AI technologies and their potential benefits, while AI-unaware companies may have limited knowledge or understanding of AI. This approach allowed for a more encompassing view of the requirements and expectations across different levels of AI adoption. By targeting both AI-aware and AI-unaware companies, the survey aimed to capture a diverse range of perspectives.

Additionally, the survey aimed to identify the **type of content** that companies would find valuable on an AI-on-Demand platform. This could include educational resources, best practices, case studies, or documentation that facilitates the adoption and implementation of AI technologies.

The research also sought to gain insights into the **AI tools and technical tools** that companies require from an AI-on-Demand platform. The survey included questions about algorithms used and models for programming frameworks, data management tools, or cloud computing infrastructure. Understanding the specific technical requirements of companies would enable the platform to provide the necessary tools and resources for successful AI implementation.

Complementing the findings of the survey, each section also presents insights gathered during consultation activities with the stakeholders' group (one-to-one interviews) offering an enhanced understanding of the underlying factors and motivations behind the companies' requirements, leading to comprehensive insights. The combination of survey data and insights from interviews ensures a holistic understanding that can inform the development and design of the platform that effectively addresses the needs of companies.

The second part of the chapter presents an overview of a series of publications focusing on the legislative development that led to the European approach to AI and the subsequent AI Act.

5.1.1 Stakeholders distribution

Among all respondents:

- 58% SMEs
- 26% startups
- 16% large Industries

5.1.2 AI maturity

Among all respondents:

- 64% are AI aware
- 36% are AI unaware

5.1.3 Countries distribution

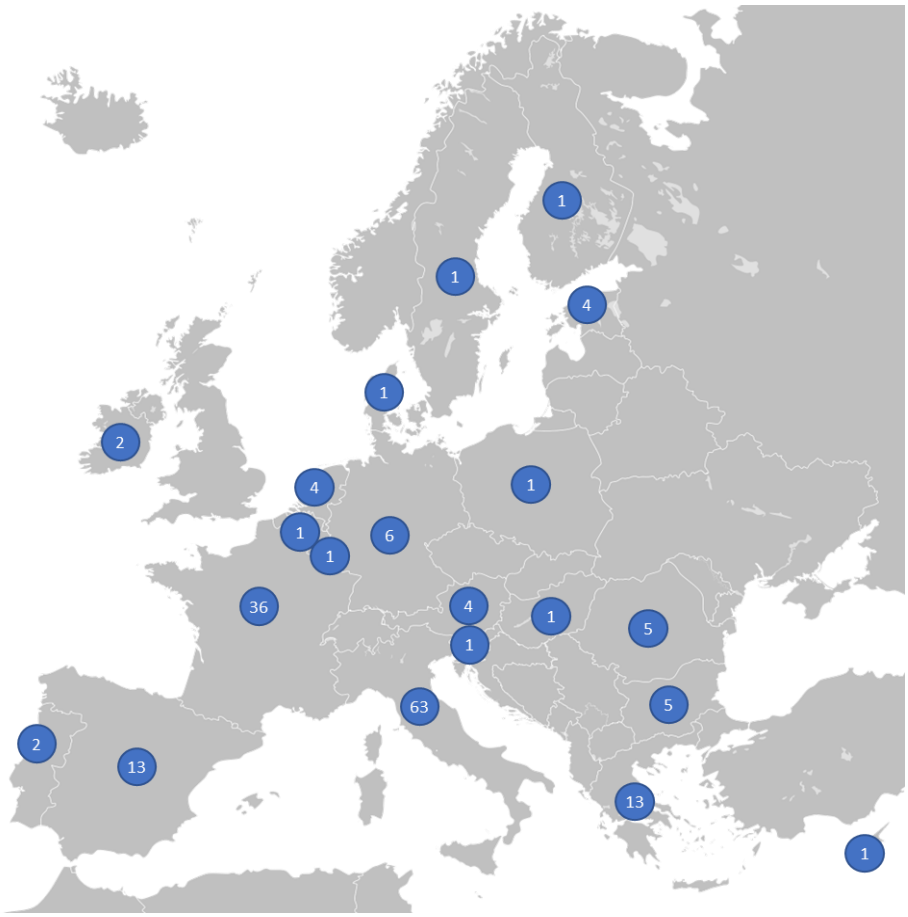


Figure 2 – SMEs and large industries countries distribution

5.2 Targets

Here are the targets set by the WP2 partners regarding the SMEs & large Industries to ensure an adequate quality of the analysis:

Questionnaires*:

- Number of questionnaires to be sent to SMEs & large Industries: 364.
- Number of expected responses from SMEs & large Industries: 310.
- Number of responses received: 232.

Online meetings:

- Number of groups, workshops and webinars expected: 3.
- Number of workshops and webinars effectively conducted: 3.

*These results were obtained by aggregating the number of responses to the questionnaire, without distinction as to how the questionnaire was filled out (autonomously or during an interview) or the stakeholder category of respondent, as the questionnaire was accessible through a single link. The number of responses received corresponds to the number of complete responses received to the questionnaire. Partial responses have been purposely excluded from the results.

5.3 Synthesis of requirements

Survey respondents primarily consisted of SMEs, accounting for 58% of the total companies surveyed. This indicates that SMEs have a significant presence and interest in AI-related matters, as they constitute the majority of the respondents. Startups comprised 26% of the respondents and large companies constituted 16% of the respondents. In terms of AI awareness, 64% of the companies identified themselves as AI aware, indicating a substantial portion of the respondents possess knowledge and understanding of AI technologies and their applications. Conversely, 36% of the companies stated they were AI unaware, suggesting that there is still a significant proportion of companies that have yet to fully engage or explore the potential of AI in their operations. This mix of AI-aware and AI-unaware companies provides valuable insights into the varying levels of AI adoption and interest across the business landscape, and it emphasizes the need for targeted approaches to cater to the specific requirements and preferences of different company types. More specifically:

- **Contacts**. AI aware companies prefer to establish contact with sector specific contacts including experts in the AI community, researchers, and like-minded professionals. These contacts can offer industry-specific insights and can share experience, helping companies understand how to tailor their AI strategies and solutions to meet industry-specific needs effectively. On the other hand, AI unaware companies benefit more from connections with solution providers that can provide tailored services and have the expertise to support companies to integrate AI technologies in their operations.
- **Content**. In terms of preferred content, both types of companies require mainly information on best practices, guidelines or success stories, documents, representing resources providing practical information, recommendations, and frameworks for implementing AI effectively and efficiently.
- **Training**. Both AI aware and AI unaware companies are interested in autonomous access to resources for learning AI skills. AI aware companies also prioritize training on trustworthy AI and regulation, highlighting their commitment to responsible and compliant AI practices. On the other hand, AI unaware companies focus on basic training modules to gain a fundamental understanding of AI applications in their specific domain. This indicates a recognition across companies of the importance of continuous learning and skill development in the rapidly evolving field of AI.
- **Services**. Overall, the analysis reveals a strong emphasis among AI aware companies on the need for resources and services that address the trustworthiness of AI solutions. This includes guidelines, legal solutions, ethical services, and assessments of AI model quality. The findings indicate a growing recognition of the ethical, legal, and technical challenges associated with AI, and companies are actively seeking support and frameworks to ensure the trustworthiness of their AI applications.
- **Funding**. Both AI aware and AI unaware companies want to be informed about funding opportunities, project proposals, and AI challenges. AI aware companies also demonstrate a specific interest in AI challenges, reflecting their desire for competitive engagement and recognition. On the other hand, AI unaware companies emphasize the importance of accessible information through funding opportunity mapping. These findings indicate a strong desire among companies, regardless of their AI awareness level, to stay informed, explore collaborative opportunities, and access financial support in the dynamic and evolving field of AI.
- **Data**. Based on the provided information, it is evident that a significant majority of companies value access to existing databases, information about data spaces in their domain, initiatives on data sharing, and methods to assess data quality.

- Overall, the analysis reveals a consistent interest among the surveyed companies in accessing various AI tools and resources. The high percentage of companies expressing a desire for tools assisting with AI regulation compliance, access to ready-to-use AI bricks and packaged models, and AI libraries for model development showcases their recognition of the importance of comprehensive tooling support in the AI domain. These findings indicate the need to prioritize the development and provision of such tools and resources on the AI-on-Demand platform to cater to the demands and requirements of the majority of companies, particularly SMEs, seeking to leverage AI technology effectively.

6 PUBLIC BODIES

6.1 Introduction and context

Despite public bodies in the EU often face relevant challenges in adopting and using AI tools and solutions, they could likewise benefit from greater uptake of AI in the delivery of public services. In this context, this section provides an overview of the most relevant capabilities needed in the AI-on-Demand platform to support the public sector.

From a methodological perspective, we conducted different kinds of activities in order to grasp to the fullest the complexity and peculiarities of this sector:

- Firstly, we conducted an extensive desk research to (i) identify main sources among literature and projects (see section 10.2.5) as well as (ii) map relevant stakeholder groups to be consulted.
- Secondly, the survey was disseminated to targeted stakeholders (considering three levels of government – national, regional and local – and adequate coverage of the European countries). The survey was complemented by other targeted consultations which included 17 one-to-one interviews – with representatives of European public administrations - and 4 focus groups – respectively conducted with:
    - 6 national public administrations
    - 8 regional public administrations and 2 representative organisations
    - 4 local public administrations and 1 representative organisation

  Among these activities, a significative partnership with the AI4GOV Master's students was established. A specific project work was dedicated to gathering and defining user requirements for the platform, leveraging the fact that the Master's course is mainly composed of civil servants. Considering both one-to-one interviews and focus groups, we consulted **more than 40 stakeholders**, covering **about 30 different European countries.**
- Overall, the factual analysis of these consultations is presented in section 10.2.1 and further enriched by Annexes (see chapters 10.2.3 and 10.2.4).
- The literature and projects review were conducted in parallel. It allowed the team to assess the main needs and trends in terms of AI adoption in the public sector. 37 literature sources published from 2019 to 2022 by relevant EU institutions were analysed (section 10.2.2.1), together with key databases to detect relevant trends in the procurement of AI assets (section 10.2.2.2). Furthermore, a thorough review of ongoing projects which will be worth to consider establishing synergies with the platform is presented in section 10.2.2.3.
- Finally, all the evidence and data collected were triangulated and analysed. Main findings are presented in section 6.3 "Synthesis of requirements". The outcome of the stakeholders' need analysis is the basis for the gap analysis contained in deliverable D2.2 "gap analysis".

Summary of established synergies within the project

Ongoing project and initiatives were analysed not only in the light of future possible synergies with the AI-on-Demand platform but also to collect information and inputs for this Study.
In particular, they allowed us to collect valuable inputs for the analysis of the literature, widening the stakeholder's network, and then conducting a conspicuous number of consultations at the different government levels and, in general, to create awareness around the AI-on-Demand platform and

tailor its further development and deployment to the user needs. For further details see section 10.2.2.3. Here below, we summarise briefly all projects and initiatives included in this exercise:

- **Study for the Adopt AI Programme**: as per call's requirements, we analysed the final study report;
- **Digital transformation for regions (DT4Regions)**: the DT4Regions project, consisting of eight European regions, is nearing its completion and has set up a platform which displays use cases ("DT Stories") with challenges of the digital transformation of the public sector and to which anyone can contribute by suggesting solutions. We analysed the content of their deliverables, navigated the platform, conducted a focus group with the Regions partners of the project and lastly, participated in the final event of the project in the session dedicated to "sister projects" (Bruxelles, June 21, 2023), to further disseminate the Pre-PAI project and its objectives.
- **Public Buyers Community**: we interviewed relevant officers from DG GROW in charge of the development of this community of practice, to understand the main features of the Big Buyers platform, in particular regarding the space devoted to "Procurement of AI" as well as its related work programme.
- **Fostering digitisation of the public sector and green transition in Europe (Govtech Connect)**: this project will run until the end of 2024 and the aim is to create a community of companies, SMEs, startups, incubators, Venture Capitalists and public sector organisations working for the digitalization of public sector. It will be carried out in synergy with the Govtech incubator of the EC. We analysed their deliverable and considered their platform on Joinup.
- **Artificial Intelligence for Public Services - AI4Gov project**: as part of the activities of the project concerning the AI4GOV Master's Program we established a valuable synergy, jointly conducting a Project Work during which Master's students, some of them civil servants, conducted stakeholders' activities to gather requirements for the AI-On-Demand platform. The Project Work developed in a co-creative environment relevant user stories and requirements deemed useful for public sector bodies in the AI-on-Demand platform. This work also included consultations with other relevant PS stakeholders of several countries (both through interviews and by disseminating the survey). Main findings were then validated in an in-person session in Nuremberg with key experts and were recollected in Group Reports (see chapter 10.2.310.2.4).
- **CommuniCity**: this project concerns fostering local community innovation processes and has been dealing with AI adoption at the local level. We conducted a focus group with the three core cities of the Project (Helsinki, Amsterdam, Porto) and other cities part of the Living.EU network.
- **Tech4GOV Watch**: within this recently started project2, the AI Watch will be updated and evolved into a proper observatory on the adoption of emerging technologies at the public sector level, which will be available on Joinup. Up to 400 new use cases of AI adoption by public administration will be collected and published within the next year.

6.1.1 AI maturity

Among all respondents:

- 33% are AI aware
- 67% are AI unaware

[2] Conducted by DG DIGIT with the support of the JRC, Trasys and Intellera Consulting

6.1.2 Countries distribution

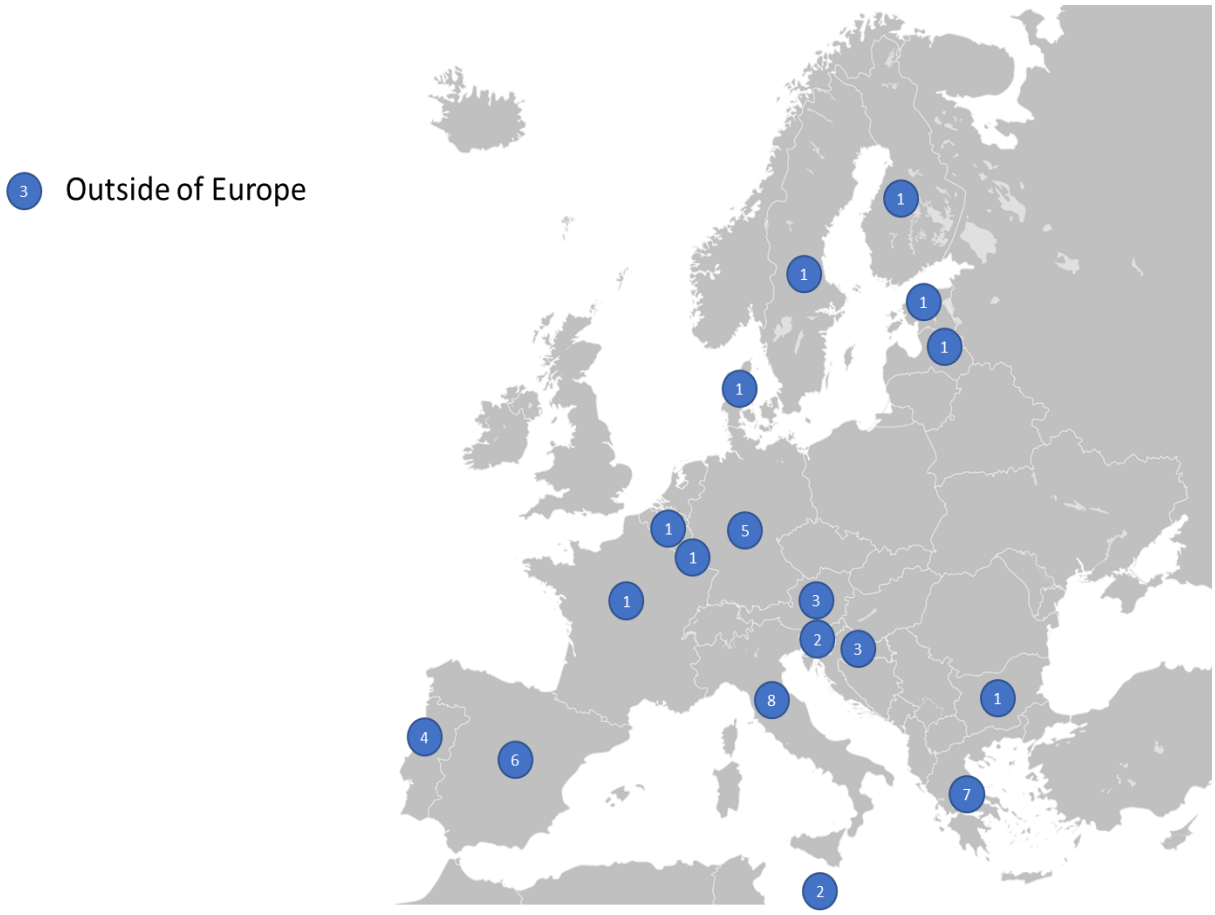


Figure 3 - public bodies countries distribution

6.2 Targets

To ensure a good quality of data collection, we reached the following targets for consultation activities.

Questionnaires*:

- Number of questionnaires to be sent to public bodies: 236.
- Number of expected responses from public bodies: 36.
- Number of responses received: 49.

Online meetings:

- Number of focus groups, workshops and webinars expected: 4 (targeted to Ministries, Regions, Cities and EDIHs focused on Public Sector)
- Number of interviews conducted: 17.

*These results were obtained by aggregating the number of responses to the questionnaire, without distinction as to how the questionnaire was filled out (autonomously or during an interview) or the stakeholder category of respondent, as the questionnaire was accessible through a single link. The number of responses received corresponds to the number of complete responses received to the questionnaire. Partial responses have been purposely excluded from the results.

6.3 Synthesis of requirements

The survey confirms what is assessed in the literature: the public sector still lags behind in AI maturity, in terms of use, literacy, capabilities and also trust. Most survey's respondents turned out to be AI unaware (67%). More specifically, we observe that:

- **More than half respondents (51%) declare they do not have an AI activity**, namely they are not developing, training or even using an AI model. **Local Public administration (PA) is the most AI-inactive in this sense**, as more than 60% of respondents from local PA are AI-inactive, while in the other levels of government (EU, national, regional) the majority of respondents declare themselves as AI-active.
- **Almost all the PA replying to the survey declare to lack in AI literacy, namely basic understanding of AI, such as what it is, what it can do, and its limitations**. The wide majority of them (82%) claim that less than 25% of their civil servants can be defined as AI Literate. This is valid for almost all the local PA.
- **More than 60% of respondents have limited AI capabilities** (i.e., to build and maintain AI models), with the majority of them declaring no **AI capability.**
- **Trust in AI systems is also a critical factor**. The share of PA with more than 50% of civil servants trusting and accepting AI systems is around 16%, while most of respondents consider that less than 25% of employees trust AI, with **most of civil servants opposing to using AI-based systems due to fear of their jobs getting replaced.**

In this context, the combination of the needs emerged from the overview of the existing literature and AI assets with the analysis of the consultation activities (survey, interviews and focus groups) provides a useful picture also to understand the extent to which the AI-on-Demand platform is expected to provide value for the public sector. The analysis of such evidence shows that the following requirements should be prioritised:

- **Contacts**. Both AI aware and AI unaware replying to the survey need to have access to AI solutions providers fitted to their needs. AI aware respondents need also to be introduced to researchers and have access to a TEF while AI unaware respondents would prefer to be introduced to like-minded companies and to participate in the AI community through forums.

  Public sector officers consulted confirm these needs to a large extent. Interviews stressed that contacts with other public administrations are also considered useful, to have a strong feeling of belonging to an AI community, but also to communicate easily on what is considered more important, given that AI is developing at a fast pace.

  The review of relevant projects shows that existing initiatives could be bridged with the AI-on-Demand platform, providing:
  - contacts of stakeholders belonging to the European AI community, both from the public and the private sector, including ICT providers (DT4Regions, Public buyers' community)
  - contacts of stakeholders of the GovTech community, including civil servants, SMEs, startups (GovTech Connect)
  - direct engagement with relevant stakeholders from the public and private sector working for the digitalisation of the public sector (AI4GOV Project)
- **Content**. AI aware and AI unaware respondents share the same need to access best practices, guideline documents, and success stories on AI projects.

  Public sector officers consulted confirmed that these types of contents are useful, however there should be a clear added value in what is provided in the platform, to avoid repetitions with other existing channels (platforms, newsletters, etc.). The need for use cases/case studies is transversal for all the interviews conducted in terms of adopted and applied, vision, actions, method, data, experienced results, lessons learned and room for improvement.

  The review of relevant projects shows that existing initiatives could be bridged with the AI-on-Demand platform, providing:
  - Success stories from regional administrations (DT4Regions)
  - News, events, reports and projects shared by other public buyers and the Commission (Public buyers' community)
  - Use cases of AI adoption (GovTech Connect)

    - Success and failure stories of AI implemented in the public sector (AI4GOV project)
- **Services**. For AI aware respondents, the following types of services have priority: (i) training services, (ii) ethical services to address the trustworthiness of AI solutions and (iii) support to data acquisition, processing and analysis. AI unaware respondents share the same needs but adding also coaching services and guidelines to assess the trustworthiness of AI solutions.

Public officers consulted confirmed the need for support in selecting the most appropriate AI solutions from the market. In order for the AI-on-Demand platform to provide unique value, several interviewees stressed the need to have opportunity to receive services to (i) write tenders specifications for procurement or (ii) experiment in a low-risk environment for both individual AI models and for the entire implementation process of an AI solution.
The review of relevant projects shows that existing initiatives could be bridged with the AI-on-Demand platform, providing support and guidelines for procuring AI-enabled solutions that are trustworthy, fair, and secure (Public buyers community).

- **Training**. AI aware and unaware administrations need training on (i) best practices for learning AI skills and (ii) basic AI modules. AI aware administrations show also a very high interest towards training on trustworthy AI, which, as confirmed in the literature, is a crucial drive of AI adoption in the public sector.

Public sector officers confirmed to a large extent the need for training. From interviews it emerged that the market already offers plenty of trainings, and it is necessary that the AI-on-Demand platform support public bodies in sorting them based on their quality. Furthermore, it was underlined that training on data management, data governance and tendering procedures could provide high added value.
The review of relevant projects shows that existing initiatives could be bridged with the AI-on-Demand platform, providing:

    - training modules on topics such as AI, data, guidelines for digital transformation etc., both in the form of webinars and written content (DT4Regions, Public buyers' community)
    - 12 months-Master's course for public officers and practitioners (AI4GOV project)
    - webinars, workshops and other events to promote networking and knowledge sharing (GovTech Connect)
- **Data & technical tools**. AI aware public bodies consider it of high importance to: (i) have access to existing datasets, (ii) know about existing data spaces in their domain (iii) know about existing initiatives for data sharing and (iv) have methods to assess data quality. Moreover, they would consider it important to have access to any type of technical tools, from AI libraries to regulatory sandboxes.

Public sector officers consulted confirm these needs to a large extent; many of whom identified lack of data quality and accessibility to data as the main challenges in adopting AI. Local public officers consulted stressed the importance of user-centric open data publishing to ensure reusability and impact. Furthermore, several interviewees expressed the need for a range of tools and resources that facilitate AI development, such as data cleaning tools, ready-to-use AI bricks, AI infrastructures for testing, compliance tools for AI regulations (e.g., the AI Act).
The review of relevant projects shows that existing initiatives could be bridged with the AI-on-Demand platform, providing catalogues of data, solutions and specific services (Public buyers community). Moreover, the JRC has recently published a Playbook to guide administrations in the use of sandboxing for organisational and technical purpose3. Despite not strictly related to AI, this could be a relevant starting point.

7 TEFS AND DIHS

7.1 Introduction and context

Digital Innovation Hubs (DIHs) are one of the four pillars of the 'Digitizing European Industry initiative' — a key instrument to foster local collaboration amongst all relevant actors involved in technology uptake (research technology organizations, system integrators, early adopters, other manufacturing

[3] Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC130555

SMEs/midcaps) as well as to channel the efforts (funding, upskilling programs, etc.) that regional and national governments dedicate to digital transformation locally. This role will be maintained, and even fostered, in the context of the 'Digital Europe Programme' (2021-2027) and the recently established European Digital Innovation Hubs (EDIHs). These EDIHs, using the experience gained on the regional level with supporting SMEs, midcaps, and public sector organizations, are now funded both from the EC and Member States. A key goal of EDIHs will be to connect hubs and organizations at a European level in cross-border collaborations for the support of their SMEs and the public sector.

Testing and Experimentation Facilities (TEFs) are also co-funded by the EC and Member States in order to become world-class specialized large-scale reference sites open to all technology providers across Europe to test and experiment at scale state-of-the art AI solutions, including both soft-and hardware products and services in real-world environments[4]. These sites will offer a combination of physical and virtual facilities as well as support for full integration, testing and experimentation of the latest AI-based technologies, including validation and demonstration. The TEFs will be central shared resources, a common toolbox offered to any user of AI-solutions in general. Four sectorial TEF projects started on January 1st, 2023, focusing on the following high-impact sectors: Agri-Food (Agrifood-TEF), Healthcare (TEF-Health), Manufacturing (AI-MATTERS), Smart Cities & Communities (Citcom.AI) aiming to solve issues/improve solutions in the respective application sector. Additionally, one technology focused TEF project (PREVAIL) has started in 2022 for edge AI Hardware to build on advanced 300mm fabrication, design, and test facilities.

Therefore, engagement with DIH networks, EDIHs and TEFs should be a key player in defining the future of the AI-on-Demand platform. The DIHs, EDIHs and TEFs will support local SMEs with the adoption of AI, connecting them to resources that facilitate AI adoption. The support offered by these entities is not limited to technical expertise, it entails supporting SMEs in the upskilling of the workforce, accessing funding, legal, data, business and ecosystem support. The AIoD platform will contribute to the role of (E)DIHs and TEFs by providing access to European AI capacities and capabilities, expertise and networks.

7.1.1 AI maturity

Among respondents identified as (E)DIHs:

- 66% are AI aware
- 34% are AI unaware

Among respondents identified as TEFs:

- 100% are AI aware
- 0% are AI unaware

[4] https://digital-strategy.ec.europa.eu/en/activities/testing-and-experimentation-facilities

7.1.2 Countries distribution

Digital Innovation Hubs (DIHs)

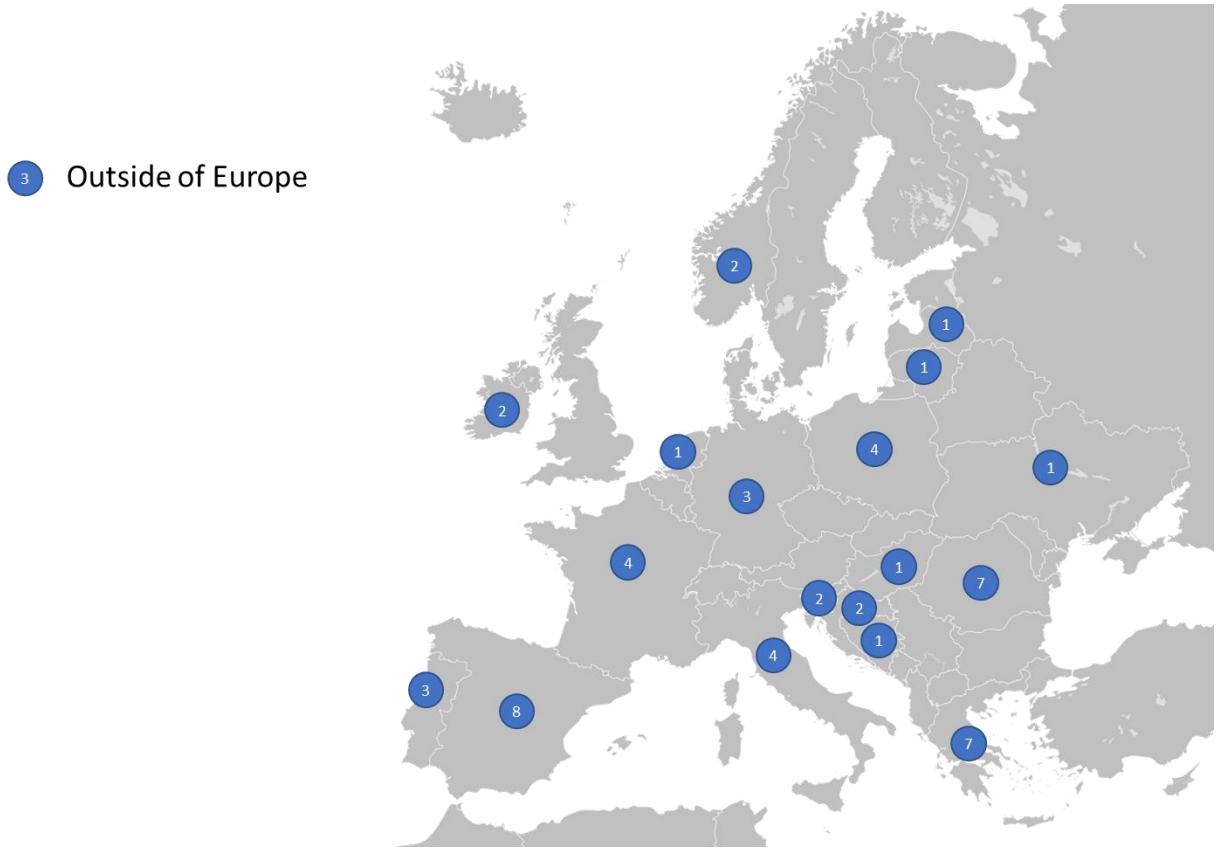


Figure 4 - DIHs countries distribution

Testing and Experimentation Facilities (TEFs)

Figure 5 - TEFs countries distribution

7.2 Targets

To ensure a good quality of data collection, we aim to reach the following minimum target for consultation activities.

Questionnaires*:

- Number of questionnaires sent to (E)DIHs: 215 DIHs and 228 EDIHs.
- Number of expected responses from (E)DIHs: 50.
- Number of responses received from E(DIH)s: 61.
- Number of questionnaires to be sent to TEFs: 5.
- Number of expected responses from TEFs: 4.
- Number of responses received from TEFs: 3.

Regarding the TEFs, in particular, as most of the projects were starting during the period, we were conducting the survey, we focused on contacting the coordinators of each of the 5 TEFs, as they would be the ones having a clearer vision. Therefore, the above targets also indicate questionnaires & responses with respect to unique TEFs. Although the survey received more responses self-declared as TEFs, in this report we consider only the answers that we have validated with the coordinators.

More specifically, we have validated the answers from Agrifood-TEF, CitCom.ai TEF and TEF-Health, although some of the coordinators were quite reluctant due to the fact that the respective projects were just starting, and they could not provide confident responses to all questions. Furthermore, we conducted online meetings followed by thorough e-mail conversations with the coordinators of AI-MATTERS and PREVAIL, who did not complete the survey but provided valuable input.

One of the TEFs interviewed reported that since it was tackling a niche sector, it would not need the use of the AI-on-Demand platform and could not see the value in such interaction. On the contrary, another TEF stated in the online interview that they would like to know the offerings of the AIoD platform and that coordination actions between the AIoD platform and TEFs are of interest.

It was also suggested that we arrange a “get-to-know-each-other" meeting with representatives from the other TEFs and of Pre-PAI. (This was partly accomplished at the Focus Group organized with selected EDIHs and TEFs, where 2 TEFs participated and one of them provided really valuable input). However, they also expressed their disappointment with AI4EU as well as concerns on increased bureaucracy and on data privacy issues that would arise when using the AIoD platform.

Their reluctance to complete the survey was also expressed as they were in a premature phase, developing the service catalogue until at least July 2023 and that their replies would be “guesswork” and “not valuable” at the moment (“should be postponed for one year”). Some were also disappointed that the survey was trying to address quite different profiles simultaneously (both DIHs/EDIHs and TEFs).

Online meetings:

- Number of interviews expected: 15.
- Number of interviews conducted: 15.
- Number of workshops and webinars effectively conducted: 3 webinars organized together with ICT-49 projects and 3 webinars organized with industrial associations.
- Number of focus groups: 1 focus group was organized to gather additional feedback from (E)DIHs and TEF.

*These results were obtained by aggregating the number of responses to the questionnaire, without distinction as to how the questionnaire was filled out (autonomously or during an interview) or the stakeholder category of respondent, as the questionnaire was accessible through a single link. The number of responses received corresponds to the number of complete responses received to the questionnaire. Partial responses have been purposely excluded from the results.

7.3 Synthesis of requirements

Based on the results provided by the **(E)DIHs** in the survey, interviews and focus group, we can conclude that the **connection with other (E)DIHs** would be a key asset for them. The possibility to learn and **exchange best practices** on the support to SMEs in the adoption of AI with other peers is very appealing.

The **(E)DIHs** are more interested in content that is more oriented to show **real examples** and provide examples of resources and tools used. Regardless of the technical requirements and content available, we believe that **raising awareness** of the different tools available and organizing **hands-on workshops** would facilitate the understanding of the potential for (E)DIHs to use the AIoD platform. Additionally, this should be complemented with activities to promote the **understanding of the legal ethical implication of the use of AI and trustworthiness**.

(E)DIHs also find it relevant to have access to information about **events**, **funding opportunities** and **training.** Academic information or access to scientific papers is less attractive for unaware AI hubs. Information about jobs is not a priority for them.

Access to **data is considered a major challenge**, the participation or involvement of data-related initiatives in the AIoD platform should be as well considered as an interesting feature. Having access to AI libraries to develop AI models or data cleaning tools are as well important to AI aware (E)DIHs.

Finally, **(E)DIHs** interviewed mentioned that for them it could be a good opportunity to offer their AI related services. There are plenty of services and offerings from (E)DIHs that could be added to the platform. Obviously, this poses a **new challenge**, the **interoperability** of the services and methodologies used by the different hubs. The co-creation of **joint roadmaps** to support SMEs in the adoption of AI could be as well promoted.

It is highly recommended to include **(E)DIHs in future discussions** on the creation of the AIoD platform, as they will act as brokers for SMEs. Making sure (E)DIHs understand the potential and facilitate access to local companies will, without doubt, contribute to making the most of the benefits and applications of AI for the European industry.

Regarding **TEFs**, it is apparent that it would be very important for them to have access to AI solutions providers, like-minded companies, TEFs, DIHs & networking opportunities to find funding and sponsors.

Access to success stories, best practices and guidelines, AI prototypes, cost examples, feasibility frameworks & QA methodologies is also very important for all TEFs.

When it comes to data, access to **all data initiatives** is vital, however, there is a **concern** on data use and sharing.

The services that all TEF respondents would like to see in the platform are **AI model quality assessment, legal & ethical, GDPR, AI-act and test-at-scale assistance**. It was additionally expressed that additional coverage, visibility and coordination of services would be an **opportunity** and that the **boundaries** between EDIHs, TEFs and AIoD platform should be further clarified.

TEFs would also like to have resources related to **funding, jobs and events**.

Regarding technical tools, **TEFs** consider access to **all types of technical tools** as important, as well as features such as **content search**.

As an overall comment, the **TEFs** are quite new initiatives and most of them are just building their service catalogues and setting up their operations. It is suggested that there is a **follow up** with them in some months in order to validate the input and get additional insight. Additionally, it would be great if there were follow up actions to **coordinate** among the different actions (EDIHs, TEFs, AIoD platform).

8 HPC, CLOUD AND EDGE

8.1 Introduction and context

In the framework of WP2, Task 2.5 focused on gathering these requirements and assessing the needs for the AIoD platform. To this end, and to provide a gap analysis between these requirements and the functionalities currently available on the platform, the technical tools section of the questionnaire was complemented with questions about the infrastructures (edge, cloud and HPC) that are needed to use these tools and deploy AI applications. The findings of the stakeholders' consultation in WP2 are presented in the following section, targeting the three groups identified by Pre-PAI: SMEs and large industries, public bodies and (E)DIHs and TEFs. The infrastructure questionnaire section was presented to AI aware respondents and to AI unaware respondents who demonstrated a higher infrastructure and data readiness on the AI maturity assessment section of the questionnaire. Its purpose was to enhance understanding of stakeholders' infrastructure readiness and to determine if challenges in adopting and utilizing AI are due to infrastructure barriers.

Today, the AIoD platform does not include any Infrastructure offerings to its users. An interesting question included in the survey is the degree of infrastructure support wanted by potential users of the AIoD platform. There are 3 main types of infrastructure or cloud computing as-a-service options and each one covers a degree of management for the user: infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS), and software-as-a-service (SaaS) as illustrated in the figure below.

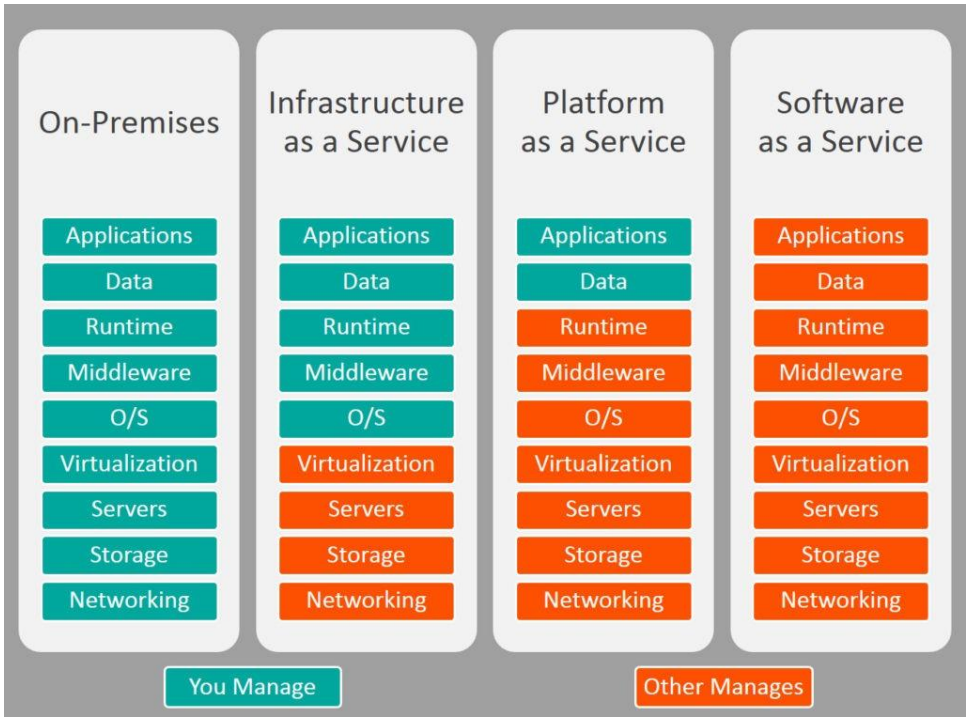


Figure 6 - Cloud computing options [Source: https://www.redhat.com/en/topics/cloud-computing/iaas-vs-paas-vs-saas]

Also, questions of particular interest are the important factors of HPC, Edge and Cloud infrastructures to the potential stakeholders. The graphs for these questions have been annotated with a stippled line indicating levels of high interest.

Additionally, this section includes a review of other projects, initiatives and papers that could have a key role in shaping the future of the AIoD platform from an infrastructure standpoint. Finally, it concludes with a synthesis of the requirements.

8.2 Targets

The questions related to Task 2.5 Edge, Cloud and HPC infrastructure have been forwarded to AI aware respondents. Respondents who answer 2-4 on either of the ML Infrastructure Readiness or the Data Readiness questions will also get the T2.5 specific questions regardless of whether they are AI aware or not. The targets are those reported in section 5.2 for SMEs and large Industries, in section 6.2 for public bodies and in section 7.2 for (E)DIHs and TEFs.

8.3 Synthesis of requirements

Notable observations from the survey, literature studies and discussions with stakeholders include:

Stakeholders use a plethora of algorithms, tools and infrastructures, see sections 10.1.1.9, 10.2.1.10 and 10.3.1.9 on technical tools for industry, public bodies and TEFs/(E)DIHs respectively. Tools related to training and inference should be made available on all infrastructure types on demand. A marketplace for tools that makes it possible to deploy needed tools on demand to infrastructure should be considered for the AIoD platform.

Access to infrastructure solutions is perceived as important and the AIoD platform should make such infrastructure easily available from the AIoD platform. The results of the survey are in line with large surveys conducted by other EC funded initiatives such as the European Cloud, Edge & IoT Continuum for business and research reported in section 10.4.2.3. The finding that adoption of these technologies is lower the less employees in a company and that high costs and low competence are perceived as barriers calls for infrastructure offers that could benefit the SMEs in particular. A model like the one

offered for HPC solutions (see section 10.4.2.1), free or subsidized use based on application, might be considered also for Edge and Cloud offers?

When it comes to the degree of infrastructure support wanted, the survey has shown that access to HPC, Cloud and Edge infrastructure is important for all stakeholders and that it is widely used for training and inference of AI/ML models and AI/ML based services and applications by the respondents. This indicates that IaaS should be part of the offering from the AIoD platform. The questions in the Technical Tools section have also shown that a plethora of tools are used when dealing with data cleaning, data analysis and AI/ML training of models. This indicates that PaaS and even SaaS, where the platforms and software being served are related to the data analysis/AI/ML domain, is of great importance. This claim is supported by the answers on important factors for cloud computing by most stakeholders (AI aware public bodies were a bit more reluctant to PaaS and SaaS). Exactly what the platforms or software that needs to be served are going to be is constantly in flux and will change over time. It is however reasonable to conclude that the AIoD platform should also include PaaS and SaaS offerings in this domain. The available offerings need to be discoverable by the AIoD platform so that AIoD platform users can be able to find and use it by interacting with the AIoD platform. Respondents have also reported that the currently available offerings that they are using have a high cost/value ratio, meaning that they are either perceived as being costly or bringing low value. This indicates that the AIoD platform should strive to serve IaaS, PaaS and SaaS offerings at as low cost as possible and evolving business models or crowd-sharing models need to be evaluated with this in mind.

When providing infrastructure, based on the survey results, the following factors will be important:

- security aspects
- cost for infrastructure (a clear cost model should be provided, possibly with comparison to the main commercial competitors)
- intelligent assistance for selecting tools and set-up as well as optimizing usage of the infrastructure across the edge, cloud, HPC continuum

From the literature review of StarlingX documentation, it seems that StarlingX could be a good open-source option for “populating” AIoD platform edges with capabilities to be able to host cloud-native applications and AI tools and providing low latency in the Edge itself. This should be investigated further. Regardless of the Edge fabric, resources in edges should be in some way discoverable and lend themself for usage by the AIoD platform in order for the AIoD platform to be able to support its users with Edge capacity. Since many of the respondents also believe that training on the Edge is important it might indicate that some sort of support for federated, split or distributed training is needed at the Edge to facilitate training across multiple Edges.

How provisioning of infrastructure should be done is an issue for further discussions that needs to involve both technical and business model considerations. Since the cost/value ratio is perceived as high, it could be of interest to investigate providing infrastructure either subsidized or at least without profit in order to decrease the cost/value ratio.

9 CONCLUSION

To support broad uptake of the AI-on-Demand platform, the needs and requirements of stakeholders have been collected and analyzed through a survey disseminated among consortium members’ networks or through interviews and workshops. By asking stakeholders their opinions about the usefulness for them of a wide range of functionalities, identified by the partners in addition to functionalities in the present AI-on-Demand platform, we have been able to better understand the stakeholders’ needs.

First, the survey shows that all functionalities listed are of interest to some stakeholders segments. However, differences appear between “AI aware” and “AI unaware” stakeholders, between SMEs, public bodies, TEFs and DIHs, probably making it necessary to design different interfaces for the different segments, just showing the useful functionalities for that particular segment. Second, the requirements are broader than just accessing technical AI tools: stakeholders want access to contacts, contents, services, training material and infrastructures for both training and inference on their AI models: the AIoD platform must be much more than a development platform.

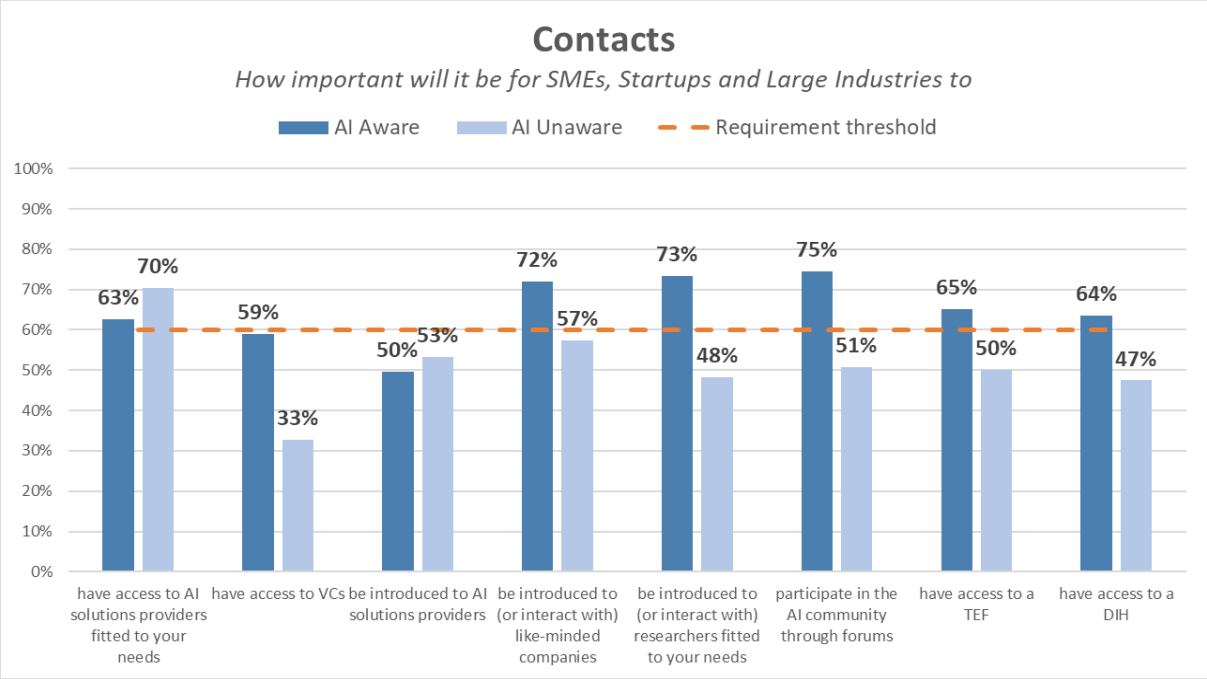
The results of the survey have informed the other WPs in Pre-PAI; they should serve as the basis to elaborate the roadmap for implementing new functionalities in the future AI-on-Demand platform.

10 ANNEX

10.1 SMEs and large industries

10.1.1 Requirements

10.1.1.1 Contacts



The survey included a question on what kind of contacts companies would like to have access to via the AI-on-Demand platform to investigate the specific areas of expertise and support required for successful AI implementation. Understanding the types of contacts companies seek allows for tailored networking opportunities, collaborations with domain experts, access to potential investors, research, support and experimentation organizations, and industry-specific professionals, all of which can aid in addressing their unique AI challenges and maximizing the platform's utility. This insight will inform the platform's design, ensuring it offers a diverse and valuable network that empowers companies to thrive in their AI endeavours.

We proposed to use a threshold at 60% of respondents to measure interest in the functionality. The figure shows a considerable variance between AI aware and AI unaware respondents: broadly speaking, AI aware respondents tend to be much more interested in having access to peers, research, TEFs or DIHs, etc., to develop their own AI solutions. On the other side, AI unaware respondents would rather have access to solution providers capable of helping them prepare tailored solutions. This discrepancy certainly reflects the different degrees of involvement in IT technologies and type of support required (e.g., AI aware SMEs are more likely to have already digitalized their internal processes -- for instance, a manufacturing company which is AI aware might have already deployed a monitoring infrastructure to check the behavior of their systems in real-time).

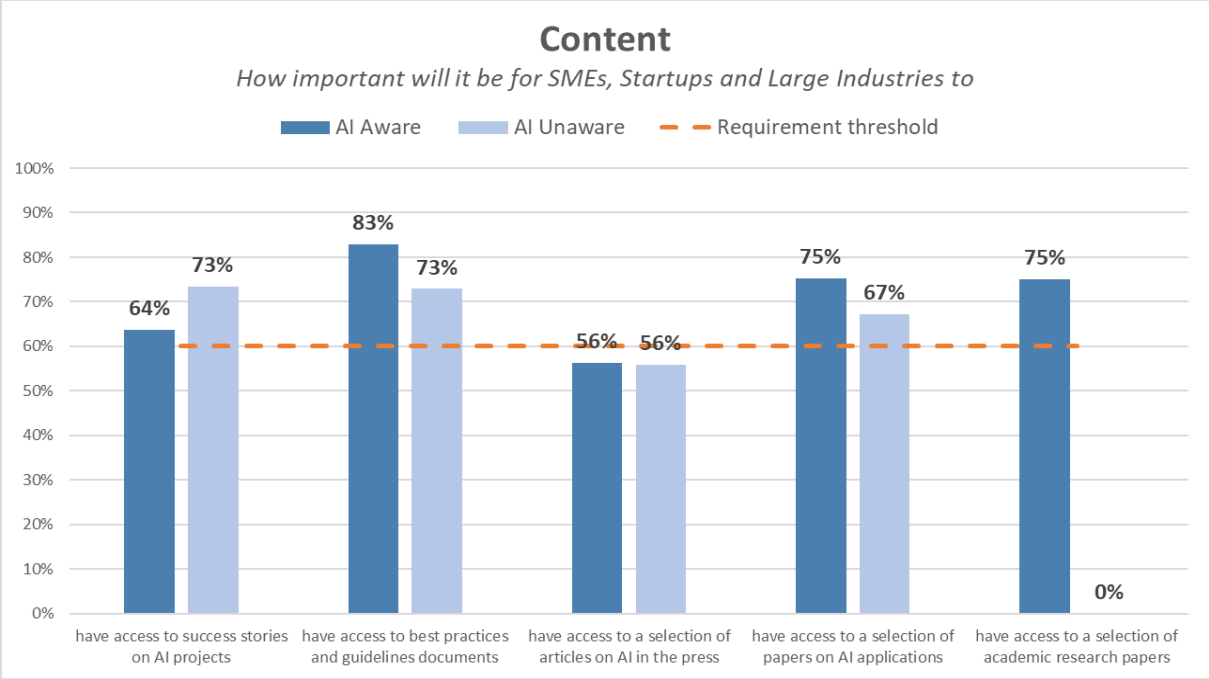
"We would like to be in touch with like-minded companies and researchers around the EU. Before the GPT we were one of the companies which started to drive AI as a product, and one of the things that we were missing were like-minded companies to share experience with each other, and also check other solutions, to see what else we can use and not start from zero each time."

SME working on software development

"Because we are a small team and we are very focused in our solution, we prefer to work with DIHs and TEFs to collaborate on open calls or make some projects around AI solutions, not necessarily for funding opportunities, but mainly to stay updated with the latest developments in the AI field."

SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

10.1.1.2 Content



To gain insights into the type of content that companies find most useful, the survey presented various options including success stories on AI projects, best practices and guidelines documents, press articles, papers on AI applications and academic research papers.

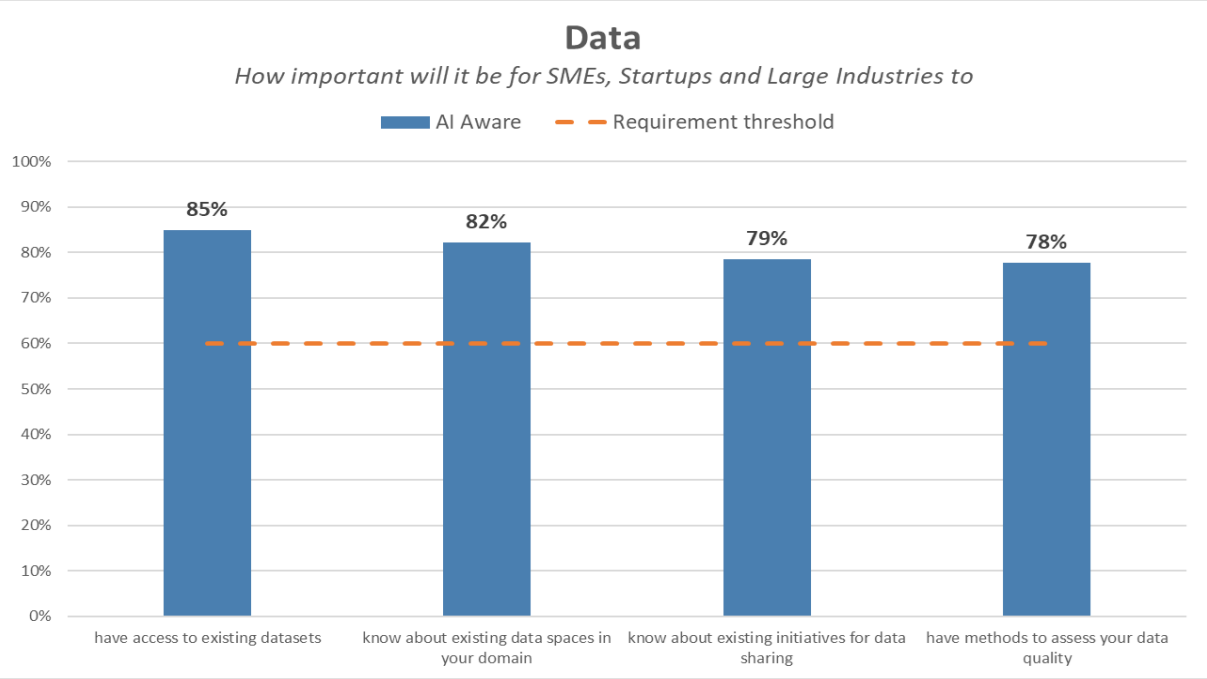
Both categories have a high interest in best practice and guidelines documents. This type of content provides a valuable source of knowledge transfer. It offers practical insights and recommendations based on successful implementations, allowing companies to learn from the experiences of others. By accessing these documents, companies can understand proven strategies, methodologies, and approaches, enabling them to make informed decisions. Both categories are interested in AI applications, best practices documents, and success stories (probably they're already aware of AI generic press).

As potentially expected, AI aware respondents are much more interested in functional content such as guidelines, research papers and papers on AI applications that outline step-by-step processes, frameworks, and methodologies refined and validated by industry experts. AI unaware respondents are (slightly) more interested in success stories and not at all in academic research papers. Access to best practices documents enables AI unaware companies to improve efficiency and cost-effectiveness in their AI initiatives. These documents offer insights into optimized processes, resource allocation, and effective utilization of AI technologies. By leveraging best practices, companies can make more informed decisions, streamline their AI adoption, and maximize the value derived from their AI investments.

"It is important to have access to best practices, use cases and success stories examples. These should include information on which tools were used, who were the partners, what was the duration of the projects, and this kind of more detailed information in order to understand the whole framework and resources used."

SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

10.1.1.3 Data



The high percentage of AI aware companies (85%) wanting access to existing databases indicates the importance they place on data availability. This suggests that companies recognize the value of leveraging existing data resources to support their AI initiatives, whether for model training, analysis, or deriving insights. Access to diverse and relevant databases can significantly enhance their data-driven capabilities.

Likewise, a substantial percentage of companies (82%) seeking information about existing data spaces within their domain highlights their interest in understanding the data landscape specific to their industry or field. This information can assist companies in identifying potential data sources, collaborations, or partnerships that can enrich their data ecosystem and expand their access to valuable data sets.

The significant number of companies (79%) expressing a desire to know about existing initiatives on data sharing suggests an increasing recognition of the benefits of collaborative data sharing. This indicates a growing trend of companies acknowledging the potential for mutually beneficial partnerships, where data sharing can lead to collective advancements, improved insights, and the development of innovative solutions.

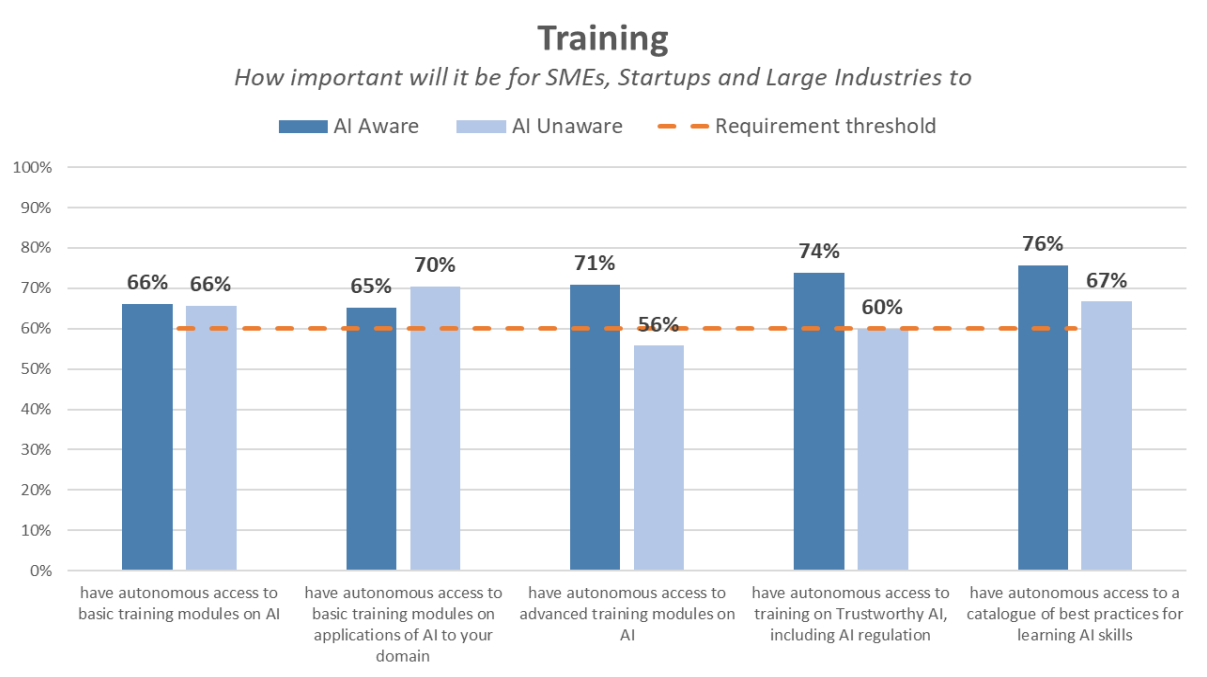
A substantial percentage of companies (78%) expressing the need for methods to assess data quality highlights the importance of data reliability and accuracy. Ensuring high-quality data is essential for developing trustworthy AI models and making reliable decisions. Companies are aware that data quality assessment methods can help them evaluate the fitness of their data for specific AI applications and mitigate the risk of bias or erroneous outcomes.

Overall, the analysis reveals a strong emphasis on the importance of data access, data quality assessment, and collaboration through data sharing initiatives. Companies recognize the potential

value in leveraging existing databases, understanding data spaces in their domain, and implementing reliable methods for evaluating data quality. This indicates a growing awareness of the significance of data-driven approaches and the need for robust data strategies to drive their AI initiatives effectively.

> *"For us, it's very important to have a catalogue of datasets providers. There are a lot of dataset catalogues out there, some better known than others, but we think it would help a lot to have access to a catalogue of datasets providers, both for research and implementation."*
>
> SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications
>
> *"Access to external datasets is critical because it will help a lot in developing new models. As a small company, we cannot generate such big datasets."*
>
> SME working on software development

10.1.1.4 Training



Overall, the analysis reveals a common interest among both AI aware and AI unaware companies in autonomous access to resources for learning AI skills. In a sort of Dunning–Kruger[5], it appears that the users that are more conscious of their need for training are the AI aware ones.

The majority of both AI aware (76%) and AI unaware (67%) companies express a desire for autonomous access to a catalogue of best practices for learning AI skills. This highlights the recognition among companies, regardless of their AI awareness level, of the importance of continuous learning and skill development in the field of AI. Access to best practices empowers companies to enhance their AI capabilities, stay updated with industry advancements, and adopt effective strategies for successful AI implementation.

A significant percentage of AI aware companies (74%) emphasize the need for autonomous access to training on trustworthy AI, including AI regulation. This indicates a growing awareness of the ethical and regulatory considerations associated with AI technologies. Access to training in this area enables them to navigate the complex landscape of AI governance and ensure responsible AI practices.

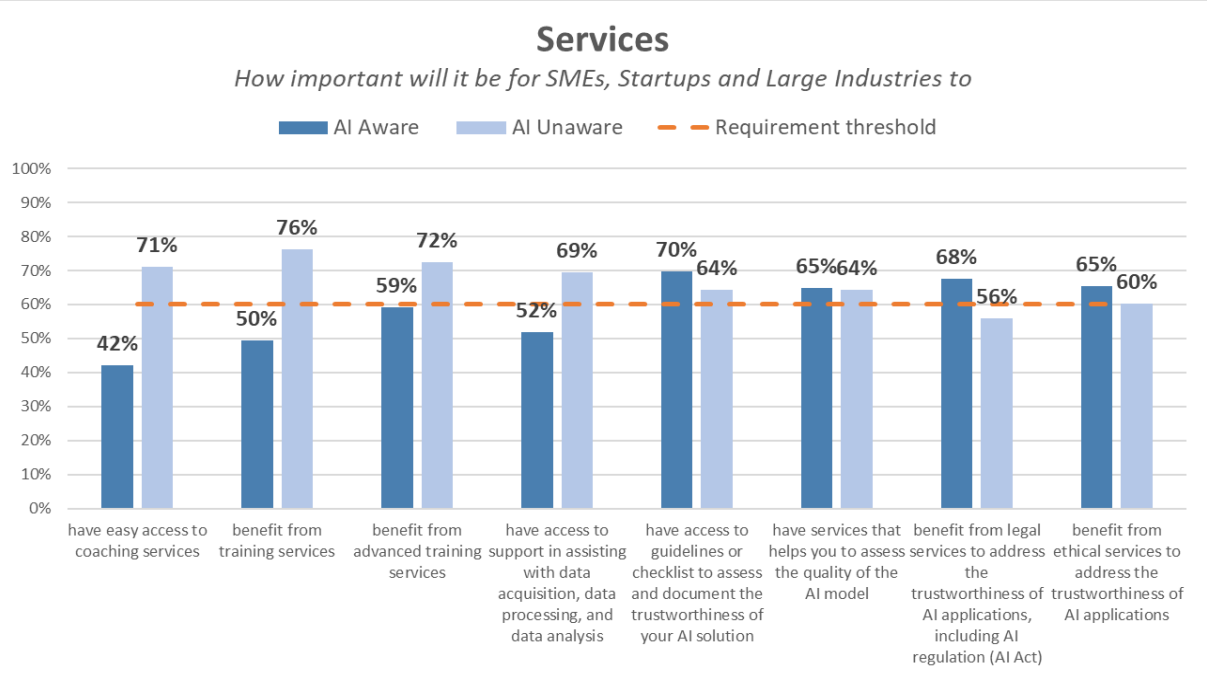
[5] https://www.britannica.com/science/Dunning-Kruger-effect

Nevertheless, feedback received during 1-o-1 interviews from industry representatives show that this kind of training will become more necessary only once the European regulation on AI will enter into force.

Most AI unaware companies (70%) express a desire for autonomous access to basic training modules on the applications of AI in their domain. This reflects their interest in acquiring foundational knowledge about AI and its potential use cases specific to their industry or field. Basic training modules can provide these companies with a starting point to understand the benefits and possibilities of AI adoption, enabling them to make informed decisions and explore relevant applications.

> *"Regarding regulation, the issues are still changing, and a lot of work is still to be done, so at the moment we don't have a specific requirement for training in this area.*
> *On other training offers, there are too many applications of AI, and it is difficult to have access to something that is so vast. Preferably, we would have a classification of use cases and depending on the use case one needs there can be specific training modules. Use cases and best practices are very important."*
>
> SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

10.1.1.5 Services



In terms of interest towards services offered, we can observe two distinct trends: AI unaware companies are much more interested in "basic" services, such as coaching, training (base and advanced), and direct support with data acquisition, processing, and analysis; conversely, AI aware companies instead expect larger benefits from higher-level services, such as guidelines or checklists, quality assurance, legal, ethical, and trustworthiness services -- underlying that they feel confident in creating an AI solution on their own. This is probably correlated to the higher level of experience and digitalization of AI aware companies, which need to focus on more specialized services.

A significant majority of AI aware companies (70%) express a need for access to guidelines and checklists to assess and document the trustworthiness of their AI solutions. This indicates a growing recognition of the importance of ensuring trustworthy AI systems. Companies are seeking structured frameworks and tools that can assist them in evaluating and documenting the ethical, legal, and technical aspects of their AI applications. This is consistent with the interest of a considerable number

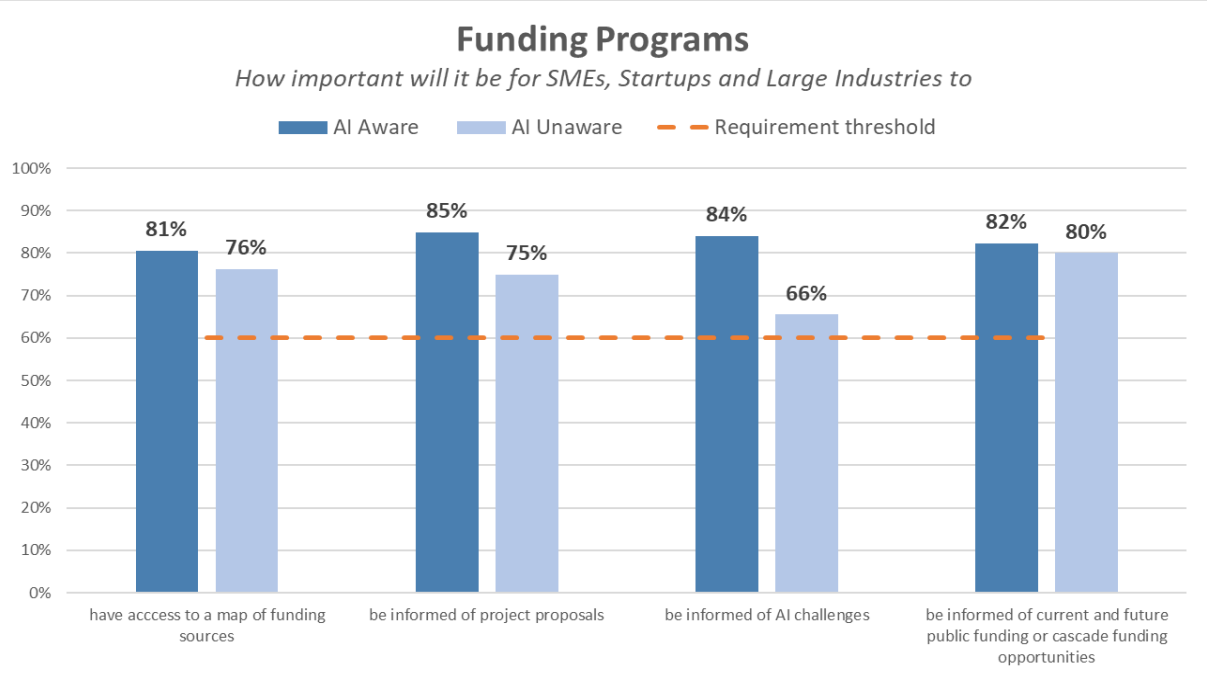
of AI aware companies (65%) in benefiting from ethical services to address the trustworthiness of their AI applications.

Moreover, a significant percentage of AI aware companies (68%) indicate a desire for legal solutions that can help address the trustworthiness of AI applications, including compliance with AI regulations. This suggests an increasing awareness of the legal and regulatory challenges associated with AI. Companies are seeking guidance and support in navigating the complex landscape of AI governance to ensure their AI systems are developed and deployed in accordance with applicable laws and regulations.

A considerable number of AI aware companies (65%) express an interest in benefiting from ethical services to address the trustworthiness of their AI applications. This demonstrates an understanding of the importance of ethical considerations in AI development and deployment. Companies are seeking assistance in integrating ethical principles, such as fairness, transparency, and accountability, into their AI solutions, ensuring responsible and trustworthy AI practices.

> *"Access to services is indeed very important for SMEs, especially for small teams like ours because we don't have the resources to get familiar very fast with regulations or other services that are and will be relevant for AI in the future. First, we would need training, especially for topics that are more recent and that are very dynamic."*
>
> SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

10.1.1.6 Funding programs



Both AI aware and AI unaware companies express a high interest in being informed about current and future public funding opportunities or cascade funding opportunities. This indicates a common recognition among companies, regardless of their AI awareness level, of the potential benefits of accessing financial support for their AI initiatives. Companies understand the importance of securing funding to drive AI research, development, and implementation.

A significant percentage of AI aware companies (85%) and AI unaware companies (76%) express an interest in being informed about project proposals. This suggests they value the opportunity to explore potential collaboration or participation in AI projects. Access to project proposals allows them to stay

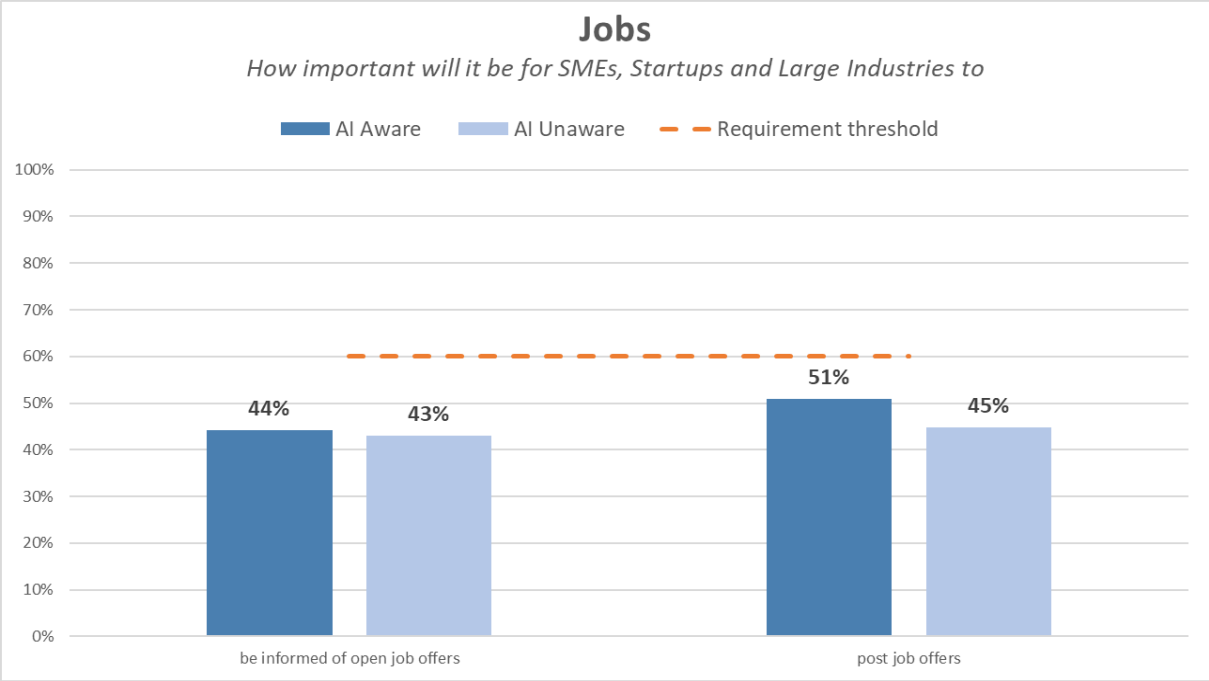
updated on new opportunities, partnerships, or initiatives in the AI field, which can foster innovation and facilitate knowledge exchange.

AI aware companies specifically demonstrate a high interest (84%) in being informed about AI challenges. This indicates their motivation to participate in competitive events or challenges that focus on specific AI problem domains. AI challenges provide a platform for companies to showcase their AI capabilities, solve complex problems, and gain recognition in the AI community.

AI unaware companies express a significant interest (75%) in having access to a map of funding opportunities. This highlights their need for structured and accessible information about various funding sources specific to AI. A funding opportunity map can assist these companies in identifying potential financial support options and guide them in navigating the complex landscape of funding opportunities.

> *"Mapping of funding opportunities is very important because it will help us focus more on areas that we want to tackle and be part of."*
>
> SME working on software development

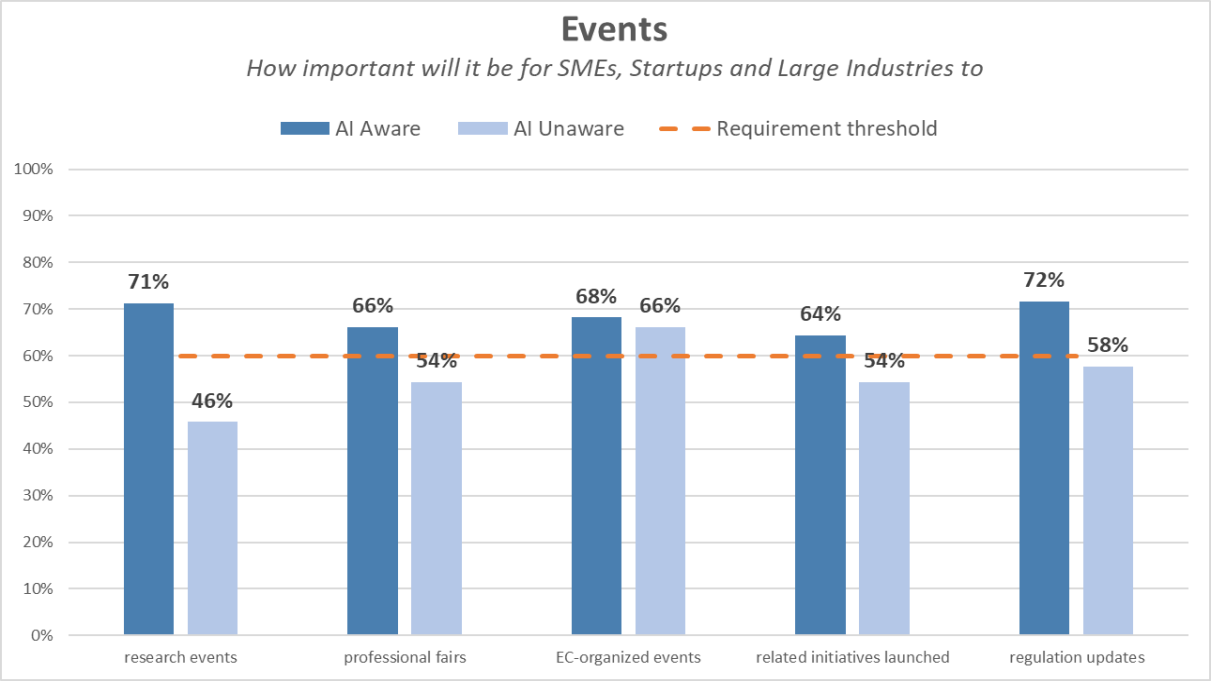
10.1.1.7 Jobs



Overall, the analysis reveals that companies, in general, are not highly interested in job information on the AI-on-Demand platform. While a moderate percentage of both AI aware and AI unaware companies express some interest in posting job offers and being informed about open job offers, the level of interest is not particularly significant. This suggests that job-related features might not be the primary focus or driver for companies utilizing the AI-on-Demand platform. This result is further confirmed by the insights gathered during the 1-o-1 interviews with companies' representatives.

> *"We mainly use LinkedIn for jobs information, using only the free tools offered by the platform. For our team that is sufficient at the moment, both for job posting and receiving offers."*
>
> SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

10.1.1.8 Events



Overall, the analysis reveals that events hold importance for both AI aware and AI unaware companies, but there are notable differences. AI aware companies demonstrate a higher level of interest in events related to AI regulation and research, suggesting a strong focus on staying informed, connected, and involved in the AI ecosystem. On the other hand, AI unaware companies, while still expressing interest in events organized by the European Commission, may have a relatively lower overall interest in participating in events. This may be attributed to their lower level of AI awareness or a greater emphasis on other resources and support mechanisms in their AI journey.

A significant majority of AI aware companies (72%) express a strong interest in events focused on AI regulation. This indicates their recognition of the importance of staying informed and updated on the evolving regulatory landscape surrounding AI technologies. Similarly, a substantial percentage of AI aware companies (71%) express an interest in research events. This suggests their commitment to staying up-to-date with the latest advancements and breakthroughs in AI research. Research events provide a platform for knowledge exchange, collaboration, and networking, allowing AI aware companies to enhance their understanding of cutting-edge technologies and explore potential research partnerships.

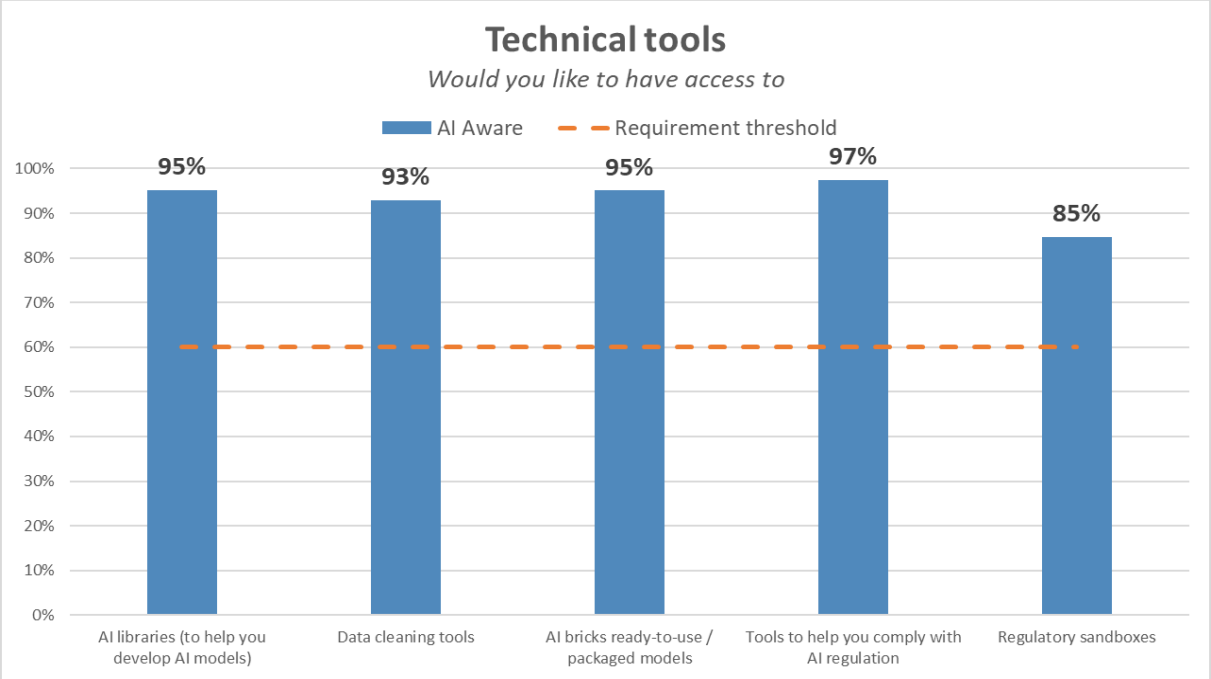
The majority of AI unaware companies (66%) express an interest in events organized by the European Commission. This indicates their recognition of the significance of engaging with prominent governmental and regulatory bodies. Events organized by the European Commission can provide AI unaware companies with valuable insights, policy updates, and networking opportunities at the European level, enabling them to better understand the AI landscape and potential regulatory implications.

> *"Participation to events, especially in-person events, is crucial for the development of projects related to AI and for networking in general. It is important for us to be informed, not that much on research events – because our team is focused on specific, B2B solutions – but more on professional fairs, events of the European Commission that can bring together all types of stakeholders, where we can meet other participants in the AI field and network more. For us, physical events are crucial, more than the online ones."*
>
> SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

10.1.1.9 Technical tools

> *"Right now, we don't use any specific tool for AI, we are waiting for the hype to settle. We see online information that is misleading, companies which claim that they use AI, that provide AI tools and solutions, but we know that they don't. Right now, we are waiting for this noise to settle down, and it would be very important to have a guide – a platform like AI-on-Demand – for catalogues or open-source projects and then to get to know the tools that can be used."*
>
> SME providing cloud business data-driven solutions, developing Software-as-a-Service web applications

As mentioned before, questions pertaining to technical tools were included for AI aware companies. The rationale behind this approach is likely to ensure that the questions are relevant and tailored to the technical expertise of the respondents, allowing for a more in-depth exploration of their AI-related needs and requirements. This enables a more comprehensive understanding of the technical capabilities and resources sought by AI aware companies, facilitating the development and provision of suitable technical tools on the AI-on-Demand platform to cater to their specific needs.



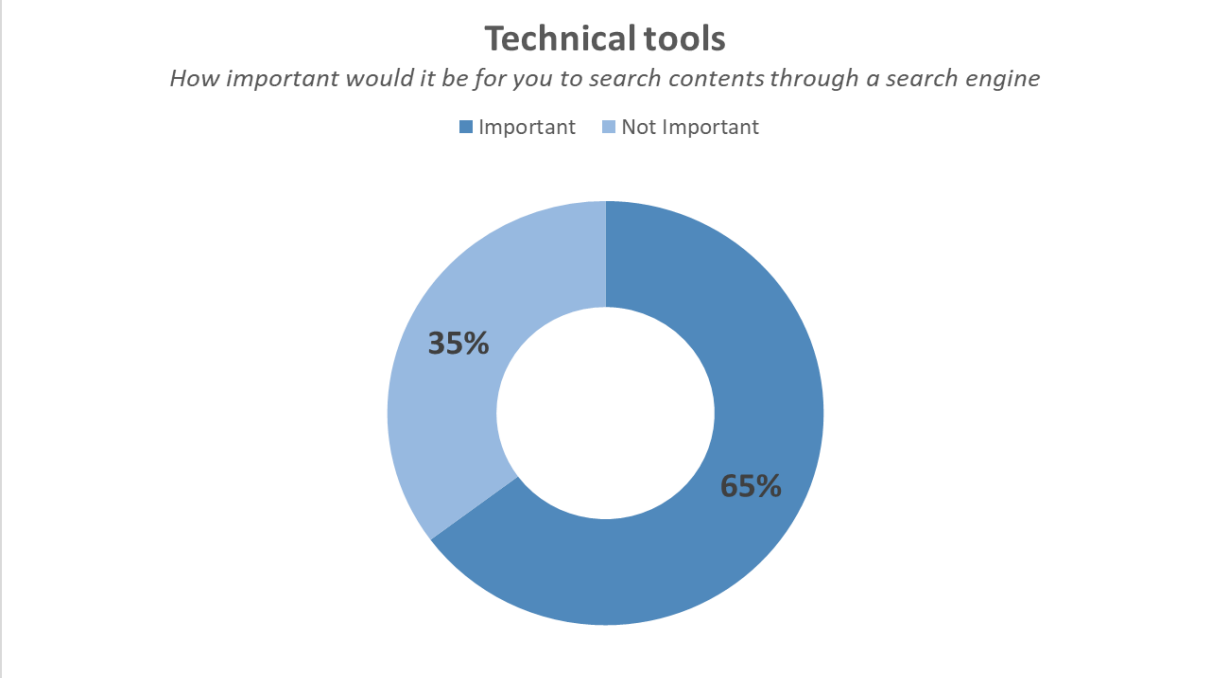
A significant percentage (97%) of the surveyed companies express a strong desire to have access to tools that can assist them in complying with AI regulations. This demonstrates the recognition of the importance of adhering to ethical, legal, and regulatory frameworks surrounding AI.

A considerable majority (95%) of the surveyed companies express a keen interest in having access to AI bricks that are pre-built and packaged models. This indicates their desire for readily available and easily deployable AI solutions. Companies value the convenience and time-saving aspect of such tools, as they can accelerate the development and implementation of AI models in their respective domains.

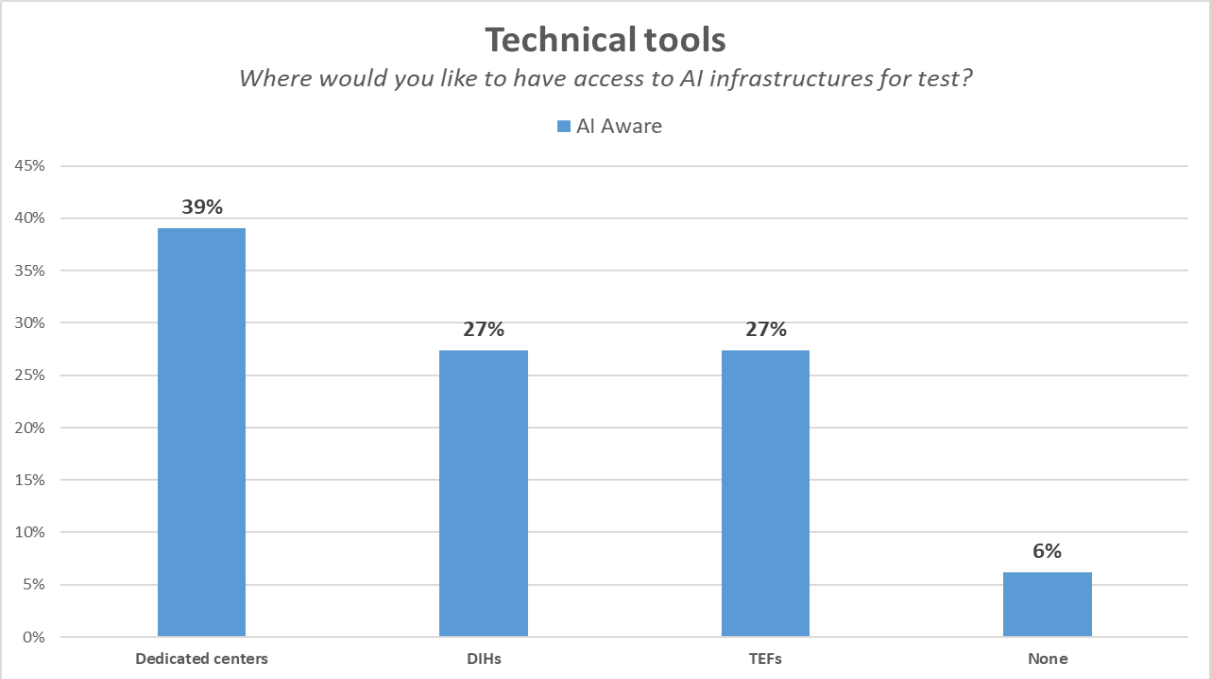
Similarly, a significant percentage (95%) of the surveyed companies express a strong interest in having access to AI libraries that can support them in developing AI models. This underscores the importance of robust and comprehensive libraries that provide a wide range of algorithms, frameworks, and resources for AI model development. Companies recognize the value of leveraging existing AI libraries to enhance their own model development processes, saving time and effort in creating AI models from scratch.

These findings indicate the need to prioritize the development and provision of such tools and resources on the AI-on-Demand platform to cater to the demands and requirements of the majority of companies, particularly SMEs, seeking to leverage AI technology effectively.

Although being the option ranked the lowest, a considerable percentage of companies (85%) express an interest in having access to regulatory sandboxes. Regulatory sandboxes provide a controlled environment where companies can test and validate their AI solutions in compliance with relevant regulations. The interest in regulatory sandboxes indicates a recognition of the value of having a safe and supportive space to experiment, iterate, and ensure regulatory compliance during the development and deployment of AI technologies.



Broadly speaking, AI aware respondents are really interested in any type of technical tools, from ad-hoc libraries and data cleaning tools to regulatory sandboxes. Companies generally expect to search contents through a search engine, probably because this has been the most common means in the last few years. It would be interesting to see whether this response will change in the following years, thanks to the diffusion of Large-Language-Models and chatbots.

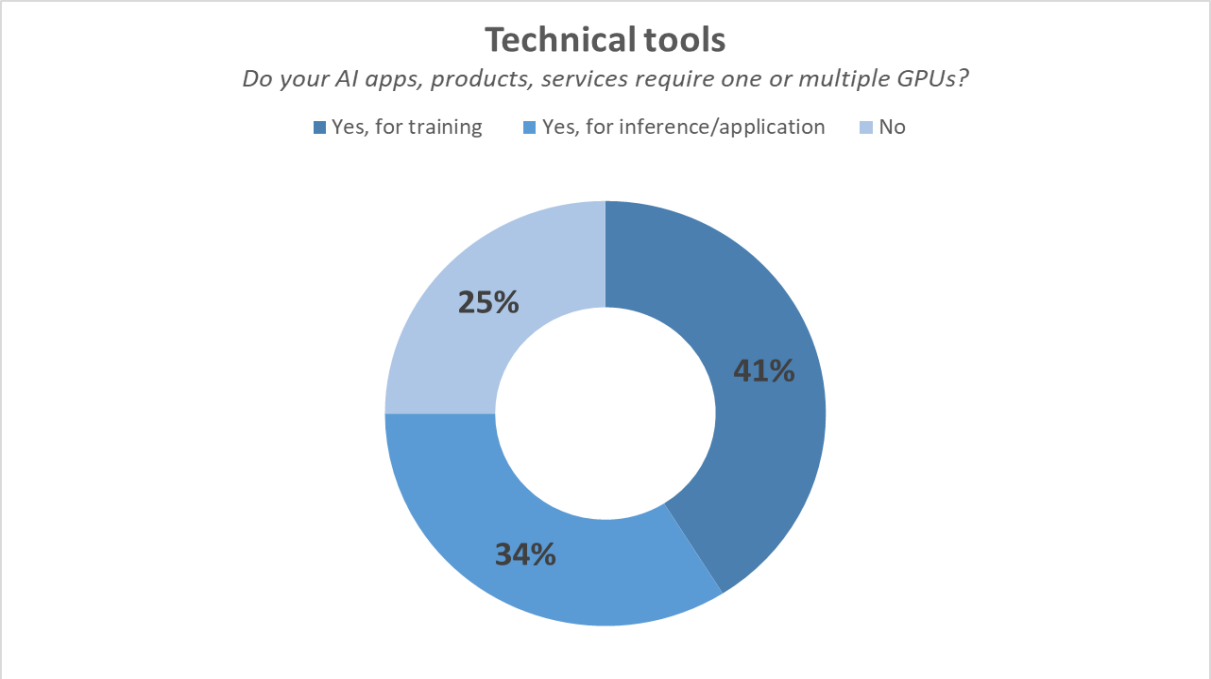


The highest percentage of companies (39%) expressed a preference for accessing AI infrastructures for tests through dedicated centers. This indicates their recognition of the importance of specialized facilities solely dedicated to AI experimentation and testing. Companies may value the expertise, resources, and infrastructure available at these dedicated centers, which can provide a controlled environment for conducting AI-related tests and experiments.

27% of companies expressed an interest in accessing AI infrastructures for tests through Testing and Experimentation Facilities. These facilities may offer a range of resources and tools that enable companies to validate, assess, and refine their AI models and algorithms in a controlled and purpose-built environment.

An equal percentage of companies (27%) expressed an interest in accessing AI infrastructures for tests through Digital Innovation Hubs. This indicates that companies see value in leveraging Digital Innovation Hubs, which serve as collaborative platforms where companies can access AI infrastructure, expertise, and support for testing and experimentation. Digital Innovation Hubs may provide a broader range of resources beyond just AI infrastructure, fostering innovation, knowledge sharing, and networking opportunities.

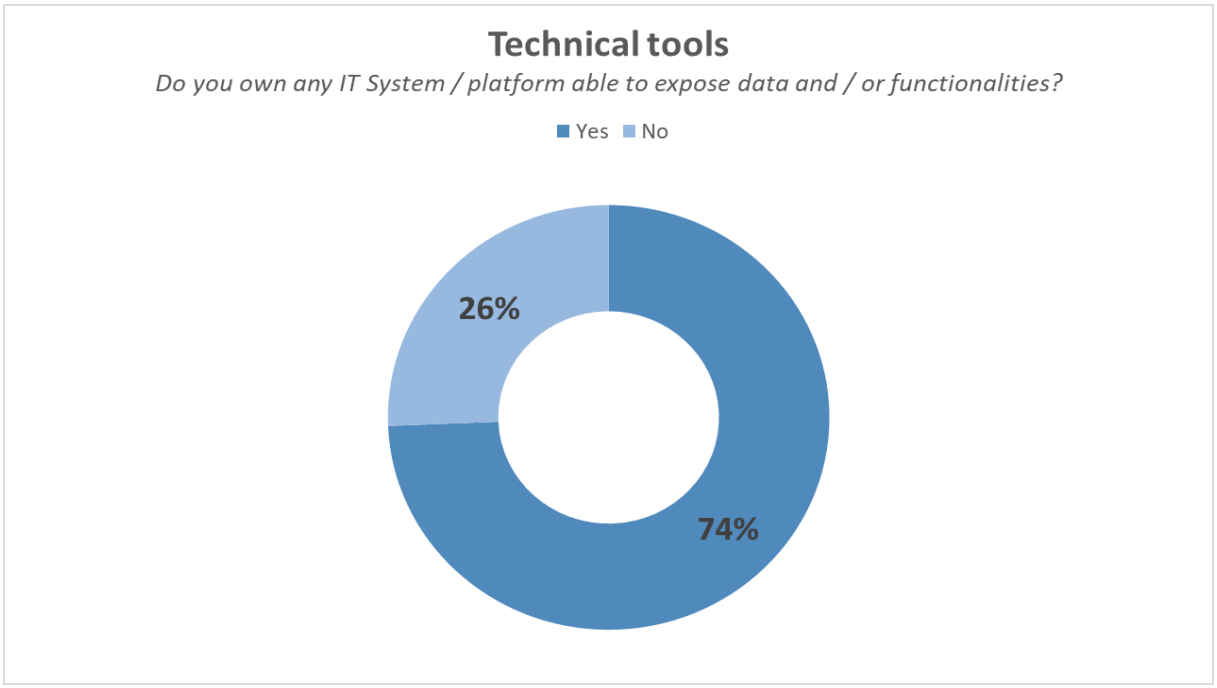
A small percentage of companies (6%) selected none as their preferred option for accessing AI infrastructures for tests. This suggests that a minority of companies may already have access to their own AI infrastructure or prefer to utilize alternative resources outside the mentioned options for their testing needs.



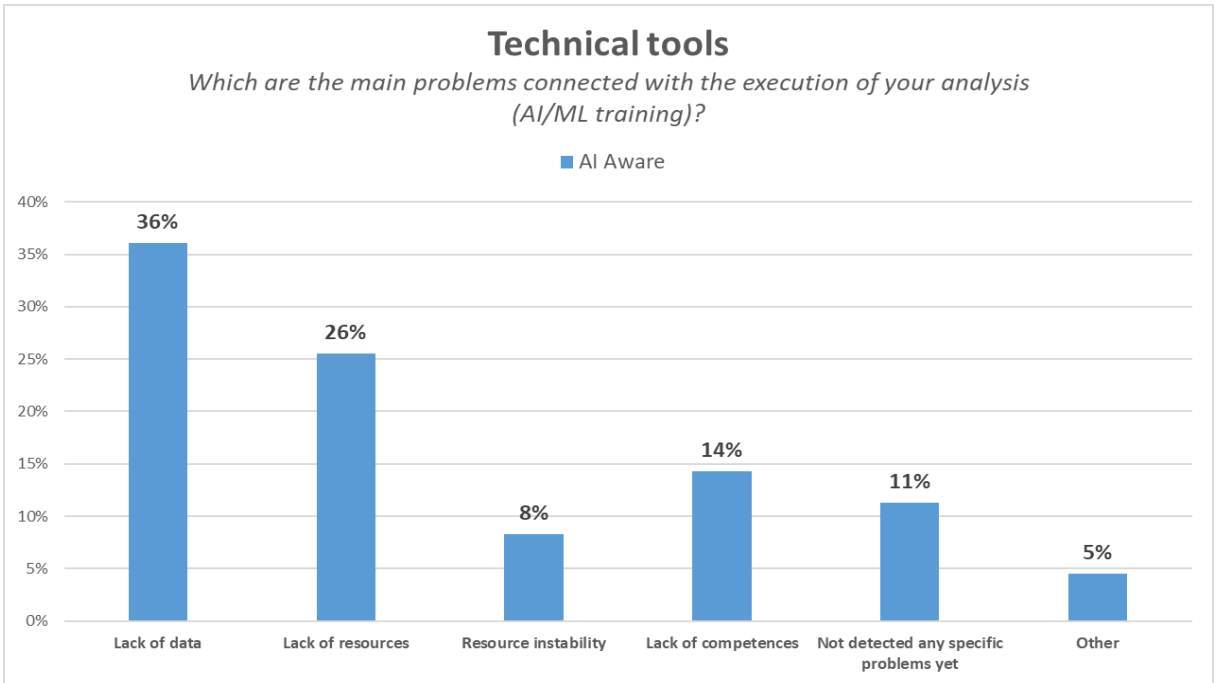
When asked if their AI apps, products, or services require GPUs for training, 41% of the companies responded affirmatively. This indicates that a significant proportion of companies recognize the computational demands of training AI models and acknowledge the need for GPU acceleration to enhance the efficiency and speed of the training process. GPUs are well-suited for handling the complex computations involved in training deep learning models, enabling companies to train their AI models more effectively.

Similarly, when asked if their AI apps, products, or services require GPUs for inference or application, 34% of the companies responded positively. This suggests that a notable portion of companies understand the benefits of using GPUs during the inference or application phase of AI, where real-time predictions or decision-making tasks are performed. GPUs can accelerate the processing of AI algorithms during inference, leading to faster and more efficient execution of AI applications.

A quarter of the companies (25%) responded that their AI apps, products, or services do not require GPUs. This implies that these companies either rely on alternative hardware configurations or have AI applications that are not computationally intensive and can be adequately processed using CPUs or other available resources.



When asked if they own any IT system or platform capable of exposing data and/or functionalities, 74% of the companies responded positively. This indicates that a significant majority of companies have their own IT systems or platforms in place that are designed to share data and/or provide functionalities to internal or external users. This suggests that these companies have invested in building or acquiring the necessary infrastructure to support data sharing and enable the use of their services or products. Conversely, 26% of the companies responded that they do not own any IT system or platform capable of exposing data and/or functionalities. This suggests that a portion of companies may rely on external systems or platforms for their data and functionality needs. They may depend on third-party services or leverage existing platforms rather than maintaining their own infrastructure for data exposure and functionality provision.

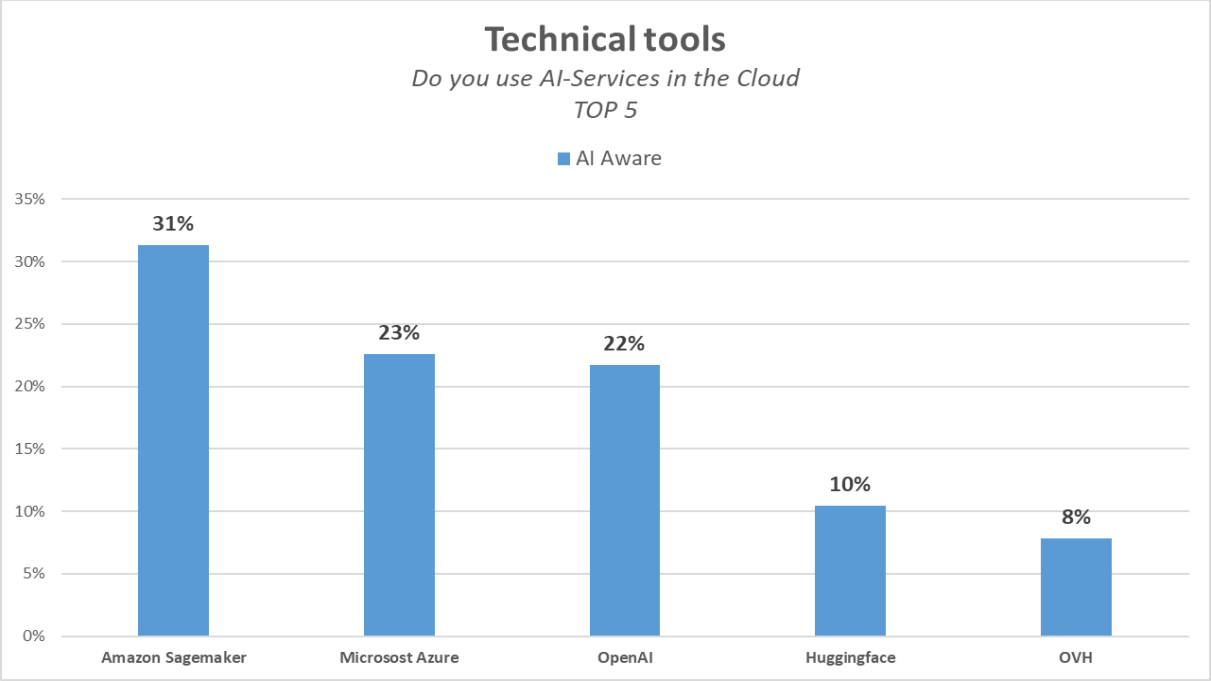


The responses indicate that companies face various challenges in the execution of their AI/ML training analysis. The most commonly reported problem, selected by 36% of the respondents, is the lack of data. This suggests that companies struggle with acquiring sufficient and high-quality data to train their

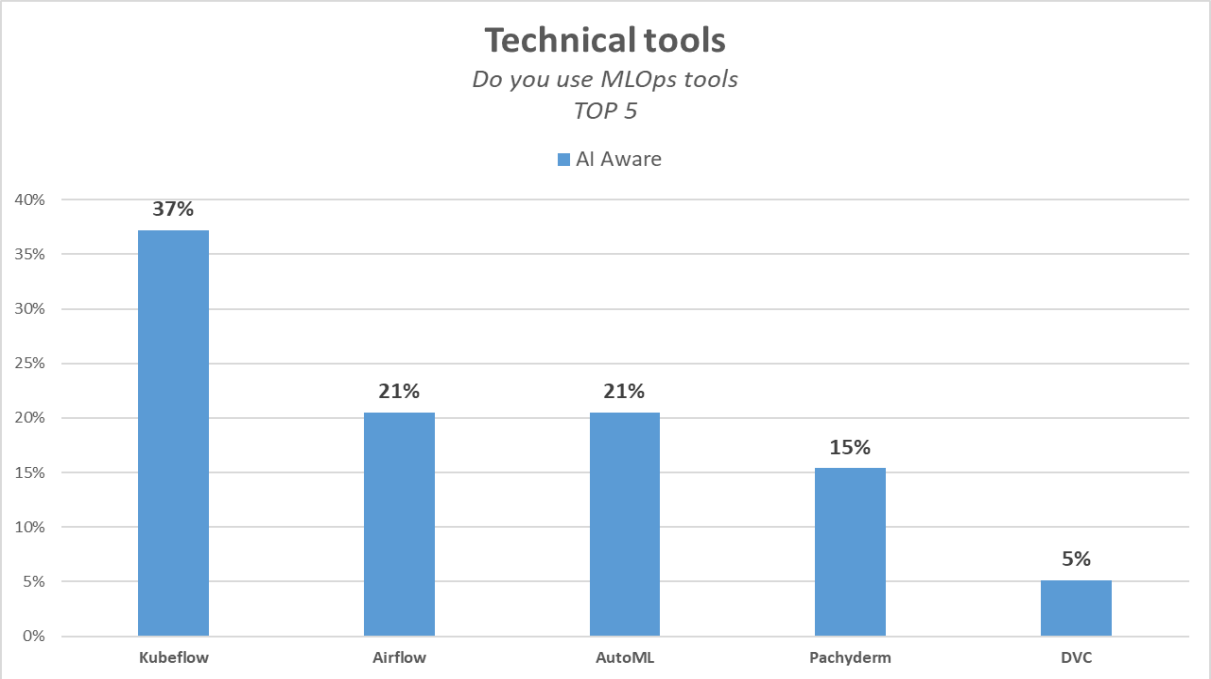
AI/ML models effectively. Additionally, 26% of the companies identified a lack of resources as a significant challenge, suggesting limitations in terms of computing power, storage capacity, or infrastructure necessary for executing complex AI/ML training tasks. Another notable challenge reported by 14% of the companies is a lack of competences, showing shortage of expertise and skills within their organization to carry out successful AI/ML training.

11% of the companies mentioned that they had not detected any problems yet, indicating either a limited understanding of potential challenges or a relatively smooth execution of their analysis. Resource instability was selected by 8% of the companies, indicating difficulties in maintaining consistent access to the necessary resources for AI/ML training. Lastly, 5% of the companies mentioned other problems not specifically listed in the survey options, suggesting the existence of additional unique challenges faced by some organizations.

Overall, these findings highlight the common pain points and obstacles faced by companies in the execution of AI/ML training, with data scarcity, resource limitations, and competency gaps being the most prevalent challenges.



Companies have diverse preferences when it comes to utilizing AI services in the cloud. Among the respondents, 31% reported using Amazon Sagemaker, making it the most popular choice. This indicates the wide adoption of Amazon's AI platform, which offers a range of tools and services for training and deploying machine learning models. Microsoft Azure is the second most commonly used platform, with 23% of companies leveraging its AI services. OpenAI, known for its advanced language models such as GPT-3, is used by 22% of the companies surveyed, highlighting the demand for state-of-the-art natural language processing capabilities. Huggingface, a popular library and platform for natural language processing, is utilized by 10% of companies. Finally, 8% of the companies reported using OVH, a European cloud provider, which demonstrates a regional preference for homegrown solutions.

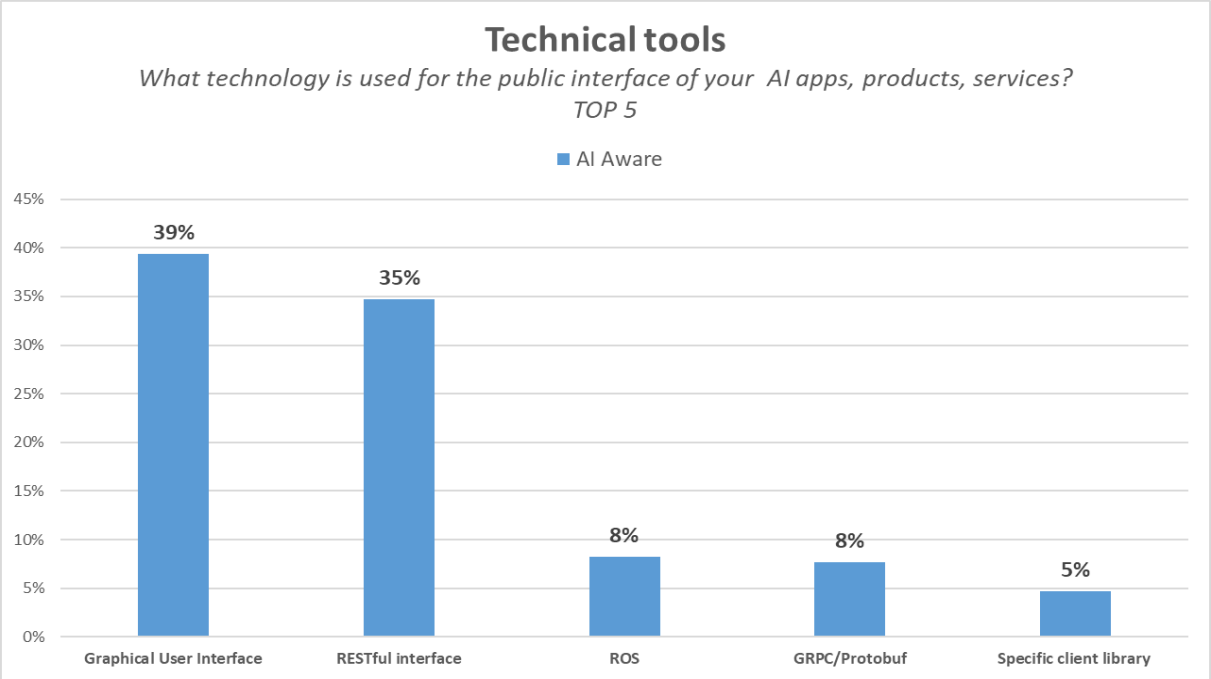


Companies exhibit a range of preferences when it comes to adopting MLOps (Machine Learning Operations) tools. The most widely used tool among the respondents is Kubeflow, with 37% of companies utilizing it. Kubeflow is an open-source platform designed to streamline the deployment and management of machine learning workflows on Kubernetes. The popularity of Kubeflow highlights the significance of containerization and orchestration in the MLOps landscape.

Airflow and AutoML are equally popular, with 21% of companies employing each tool. Airflow is a widely adopted platform for workflow management, allowing companies to create, schedule, and monitor complex data pipelines. AutoML, on the other hand, represents the growing trend of leveraging automated machine learning tools to streamline model development and deployment.

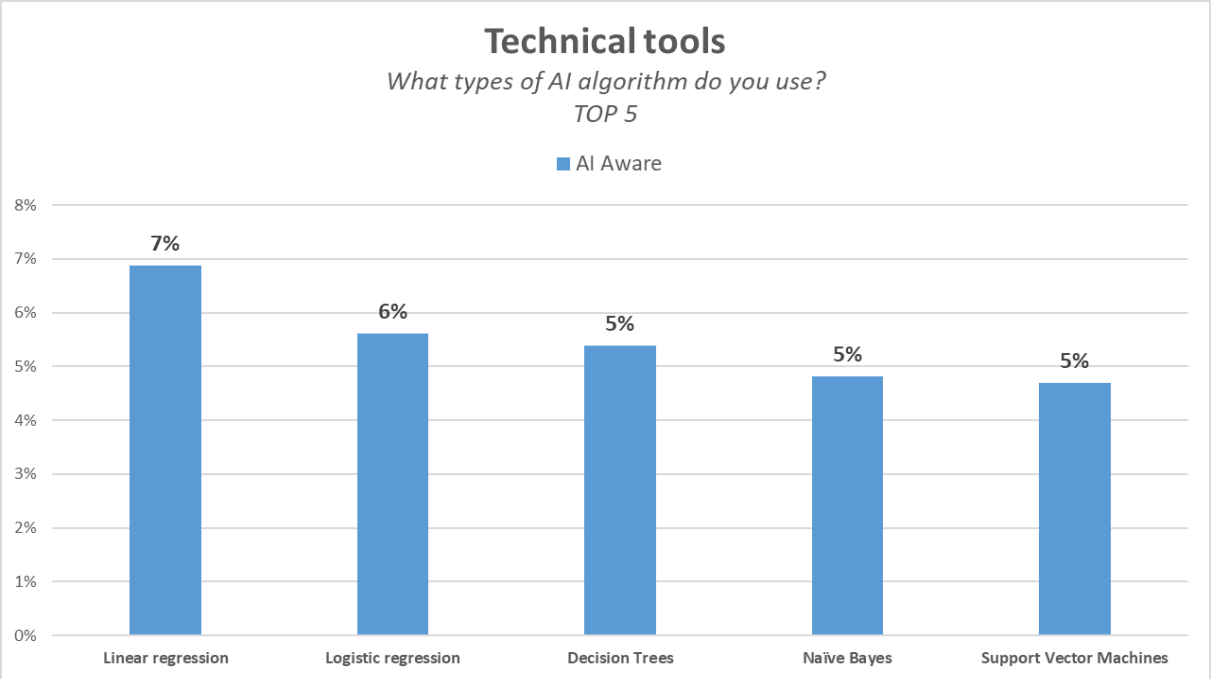
Pachyderm, chosen by 15% of companies, is an open-source data versioning and data lineage tool, highlighting the importance of data management in MLOps workflows.

Lastly, 5% of companies reported using DVC (Data Version Control), a tool that facilitates data versioning and collaboration in machine learning projects.

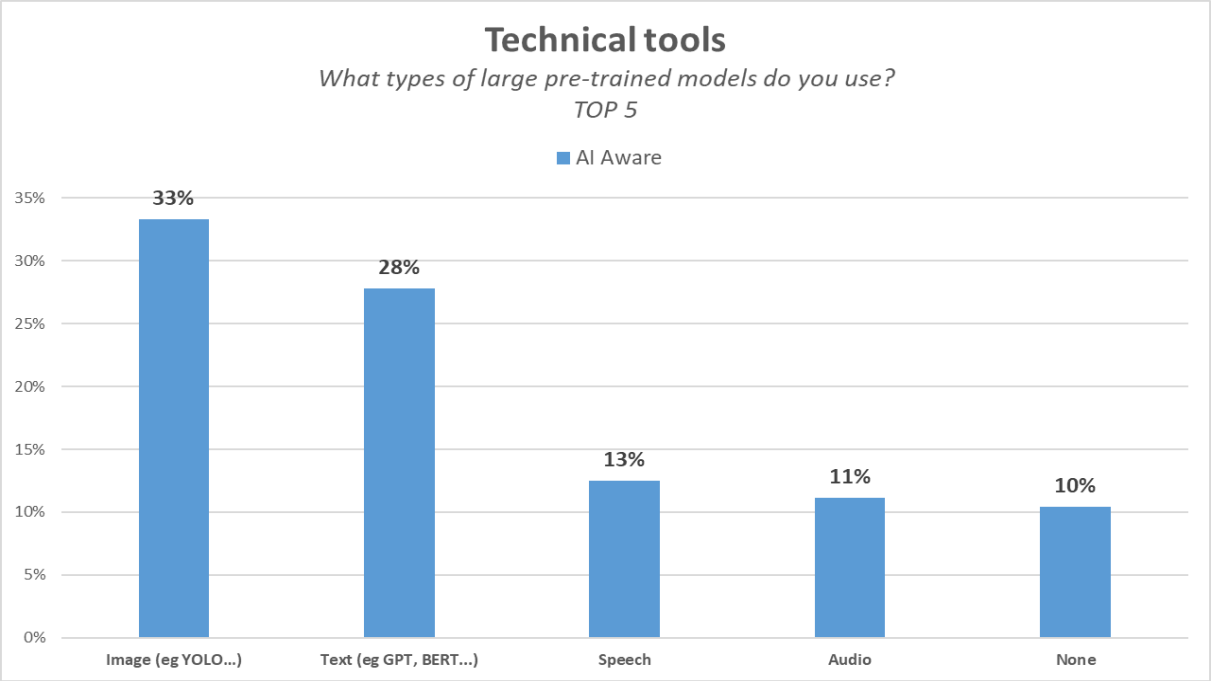


The most commonly chosen interface is the Graphical User Interface (GUI), selected by 39% of companies. This indicates that a significant portion of companies prefer to offer user-friendly visual interfaces to interact with their AI applications, allowing users to easily navigate and access the functionalities. RESTful interfaces are the second most popular choice, with 35% of companies utilizing this architectural style for their public interface. RESTful interfaces provide a standardized and lightweight approach for communication between different systems or components.

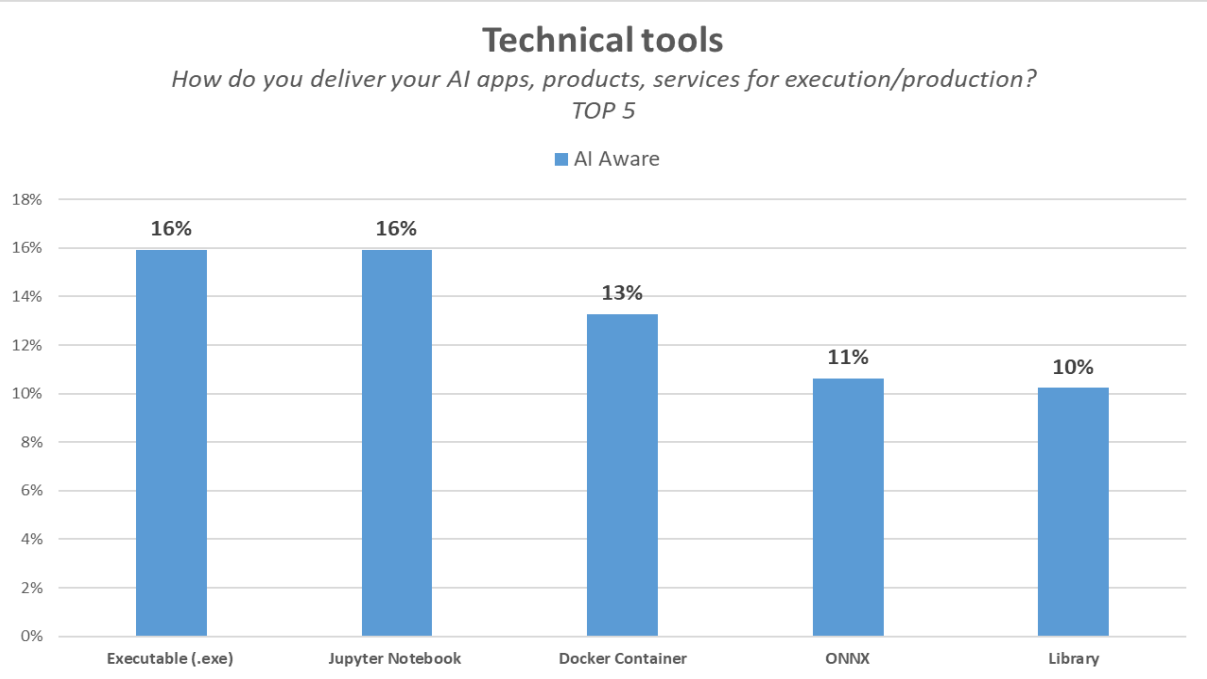
A smaller percentage of companies, 8% each, reported using ROS (Robot Operating System) and GRPC/Protobuf for their public interface. ROS is a popular framework for developing robotic applications, indicating the presence of companies offering AI solutions in the robotics domain. GRPC/Protobuf, on the other hand, is a high-performance communication protocol often used in distributed systems. Finally, 5% of companies mentioned using specific client libraries for their public interface, suggesting the customization or development of dedicated software libraries to interact with their AI applications.



The AI algorithms mostly used appear to be classical machine learning algorithms, that is linear regression, logistic regression, decision trees, Naïve Bayes and SVMs. This is probably connected to the fact that these models can be explained and trained in an easier manner compared to Deep Neural Networks (at least broadly speaking).



In terms of Deep Learning models, the most used ones are those related to computer vision (especially image processing), closely followed by text, speech (natural language processing). Computer vision and natural language processing considered together make up almost three quarters of the entirety of the deep learning models used by SMEs. This is entirely in line with the advancements in these fields in the last few years, fostered by research in both the academic and industrial sectors.



Companies adopt various methods to deliver their AI apps, products, and services for execution or production. The most common delivery option selected by 16% of companies is the use of Executable (.exe) files. This indicates a preference for delivering standalone executable files that can be directly run on compatible systems, providing a user-friendly and easily deployable solution.

Jupyter Notebook is also a popular choice, with 16% of companies opting for this interactive and collaborative environment for delivering their AI applications. Docker Container, chosen by 13% of companies, highlights the utilization of containerization technology to package and deploy AI solutions in a portable and scalable manner.

ONNX (Open Neural Network Exchange) is selected by 11% of companies, indicating the adoption of a standardized format for exchanging machine learning models across different frameworks and platforms. Lastly, 10% of companies mentioned delivering their AI apps, products, and services as libraries, emphasizing the development and distribution of software libraries that enable integration and customization within other applications or systems.

10.1.2 Overview of existing literature and AI assets

10.1.2.1 Compliance and regulatory aspects

10.1.2.1.1 Boosting the use of ai in Europe's micro, small and medium-sized enterprises

Date of the review	27.02.2023
Name of the project or initiative / report reviewed	Boosting the use of Artificial Intelligence in Europe's micro, small and medium-sized Enterprises (2021)
Project Owner / Author	European Economic and Social Committee
Link to the project or any useful documents	https://www.eesc.europa.eu/sites/default/files/files/qe-02-21-953-en-n.pdf
Main functionalities delivered by the project / Main points covered in relation to SMEs	

• In regard to the SME adoption of AI, the report highlights the high costs of regulatory regimes and legislative uncertainty are seen by European companies as a major external obstacle to AI adoption (p. 21). • There is a need for a clearer, transparent legal framework that SMEs can use to maintain their competitiveness. As a solution to this, the EC already in 2021 proposed a European approach to AI, which would create a regulatory framework for AI based on human and privacy rights of Europeans. • This was specified in the White Paper on Artificial Intelligence addressing eight kinds of actions including the creation of excellence and testing centres that will combine European national and private investments and introduce new legal instruments (if necessary). This was done as the EC acknowledged that European companies have various unmet needs that need to be addressed through adjusting the existing EU legislations in terms of liability, data protection and compliance according to the EESC report (p.58). • The proposed legal framework was designed to intervene only where it is strictly needed and with a light governance structure that minimizes the burden for economic operators. (p.59) • In terms of compliance, the Commission put forward the proposal for the creation and use of regulatory sandboxes to test innovative technologies for a limited time. (p.59)
Review summary note
The report provides a thorough overview of the AI uptake for Europe's MSMEs with an in-depth sectoral and EU Member State analysis. The report highlights the European Commission proposals to regulate and address the challenges that European micro, small and medium enterprises have encountered with the emergence of AI technologies. The report looks at the policy landscape and the EC proposals on how to mitigate the good and the bad of AI technology use and development. In particular, the Report provides sector specific overview of the AI uptake (e.g. health, construction and others) and the policy summary of AI in Europe. The study also identified the key challenges that Micro enterprises and SMEs encounter in AI uptake, this includes such areas as skills, availability of data, costs, fragmented market and lack of infrastructure. EESC addresses these challenges in a set of recommendations based on the specific sector-related issues, while also addressing the broader trends relevant across the disciplines. To boost the uptake of AI amongst the micro, small and medium enterprises, the report identified that the following areas need to be improved: • Bridging the gap between the labour skills and the corresponding demand for AI, education and training opportunities. • Promote a targeted support system from finance and infrastructure to data availability and interoperability • Guiding best practices, promoting success stories, and sharing experiences that can serve as a starting point for a broad AI uptake among MSMEs

10.1.2.1.2 The AI Act: help or hindrance for SMEs?

Date of the review	27.02.2023.
Name of the project or initiative/report reviewed	The AI Act: help or hindrance for SMEs? (2023)
Project Owner/Author	Intellera Consulting

Link to the project or any useful documents	https://www.intelleraconsulting.com/documents/42559/59109/AIactpaper_v16_singola_web.pdf/21ea39c2-7b26-7115-5266-a49e8875e7be?t=1668448362037

Main functionalities delivered by the project/Main points covered

Building on the key findings of "Study to Support an Impact Assessment of Regulatory Requirements for Artificial Intelligence in Europe" (IARR), the report aims to define a theoretical model to calculate compliance costs for SMEs and to corroborate the findings with the development of an empirical example (p.4-5). To this end, several scenarios were developed to estimate the impact of the AI Act proposal on SMEs:

- Scenario 1: The calculation of AI Act's impact on SMEs follows the standard cost model approach provided by the IARR and uses real case data from European SMEs providing AI technologies. Following the assumptions and cost model of the IARR, the total costs modelled to the typical SME equal 17.3% of total revenues and can be also expressed as about 71 FTE. This scenario would be hardly feasible for SMEs and would constitute a decisive barrier to market entry. (p.28)
- Scenario 2: also follows the approach provided by IARR but adding a significant assumption: the number of AI units is calculated by dividing the R&D value by the AI unit value. This scenario is way more feasible for SMEs since the compliance costs account for 2.7% of total revenues but considering an average hourly rate of € 32, SMEs would still need more than 10 FTEs in total costs to meet compliance requirements. (p.29)
- Scenario 3: provides an alternative approach to estimate the total cost of compliance taking into consideration also software development costs which were not considered in the first and second scenarios. In this scenario, compliance costs for SMEs account for about 1.3% and would equal for 2.75 FTEs to cover the activities to comply with the requirements. Considering these figures, the likelihood of SMEs adopting AI technology increases significantly, despite the associated costs incurred by the adoption of the AI Act. (p.30)

Going beyond the three main approaches to calculate total compliance costs for SMEs, the report also examines potential factors that may reduce the burden of complying with the requirements of the proposed AI Act, such as learning curve and spill-over effects, that may generate potential benefits in the medium-long term (p.32). Further cost savings that could be achieved if synergies within the SME ecosystem are considered. Actions included in the National Recovery and Resilience Plans (NRRPs) and the activities promoted by the European Digital Innovation Hubs (EDIH) could be key to support SMEs in adopting measures to comply with the AI Act. (p.32)

European Digital Innovation Hubs (EDIH), in particular, could play a crucial role in contributing to reducing SMEs cost to meet AI Act requirements by:

- Developing and offering trainings on AI requirements and compliance (p.37)
- Offering services to support SMEs in compliance activities. (p.37)
- Fostering a standard - yet specialized - approach to compliance activities across Europe, thus facilitating economies of scope (p.37)
- By acting as the nearest point of entry to Testing and Experimentation Facilities (p.37)

Therefore, the role of the EDIHs should be better explored to understand the breadth and depth of concrete support they can provide to SMEs in complying with the new regulation. (p.32) (p.36)

To this end, the report suggests collecting empirical validation by gathering a panel of SMEs representative from the various Member States for both suppliers and users. With these SMEs, researchers will conduct a structured assessment of their AI applications that will include AI application mapping, categorization, and risk ranking. This would provide a clearer picture of the costs incurred by SMEs to comply with the regulation. (p.37)

Review summary note
In February 2020, the European Commission presented a White Paper proposing a framework for trustworthy AI based on excellence and trust. In April 2021, the EC went a step further proposing the first regulatory proposal on artificial intelligence, the “AI Act”, with the aim of establishing a trustworthy framework for the development and use of AI. The AI Act adopts a risk-based approach, establishing a set of requirements to which AI technology providers must comply. These requirements, although essential, can result in high compliance costs for companies, especially for SME. Therefore, the purpose of the report is to provide an estimation of costs that SMEs would face when achieving compliance with the requirements of the AI Act. The analysis is carried out using the work of the “Study to Support an Impact Assessment of Regulatory Requirements for Artificial Intelligence in Europe” (IARR) as a baseline. Along with the methodology adopted by the IARR for calculating the impact costs related to the adoption of the AI Act proposal, the report also proposes an alternative approach for estimating costs for SMEs. The author`s thesis is that there could be significant opportunities to activate economies of scale and scope for SMEs adopting AI technology, which will generate cost savings within the SMEs ecosystem and increase confidence in embracing AI-based solutions. Lastly, the report provides recommendations on how SMEs can streamline their compliance with the requirements of the AI Act following its adoption

10.1.2.1.3 AI Watch: Artificial Intelligence Standardisation Landscape Update (2023)

Date of the review	27.02.2023
Name of the project or initiative/report reviewed	AI Watch: Artificial Intelligence Standardisation Landscape Update (2023)
Project Owner/Author	Publications Office of the European Union
Link to the project or any useful documents	https://publications.jrc.ec.europa.eu/repository/handle/JRC131155
Main functionalities delivered by the project/Main points covered	
The report analyses 8 documents of the Institute of Electrical and Electronics Engineers (IEEE) showing how the specifications provided by IEE can complement ISO/IEC standardization landscape for the AI Act since, despite the significant ISO/IEC standardization work currently underway in the Joint Technical Committee (JTC) 1/SC42 on AI, there are still many gaps to be covered to fully meet the requirements of the AI Act. (p.6) Specifically, 3 IEE valuable standards seem to complement the ISO/IEC JTC1 SC42 landscape very well: (p.29) • IEEE P7003 “Standard for Algorithmic Bias Considerations • IEEE P7001/D4 “Draft Standard for Transparency of Autonomous Systems” • IEEE 7000 “Standard Model Process for Addressing Ethical Concerns during System Design” Technical specifications outlined in these standards would assist the operationalization of the AI Act requirements for high-risk artificial intelligence systems, complementing the ISO/IEC landscape. Furthermore, in cases where the adoption of these standards as a whole might not be the most effective way to proceed, the analysis conducted by the JRC could ease the identification of content to be integrated into future specifications and specific areas in which to integrate them.	

These include creating stronger links with AI-specific risks and state-of-the-art techniques, providing solid parameters to measure AI reliability or, in some cases, covering the entire life cycle of the AI system. In addition, when considering complementarities with other standards from ISO/IEC, an alignment of the terminology employed would also be needed, e.g., with regard to specific terms related to risk, transparency and bias. (p.33)
Review summary note
In December 2018, the European Commission (EC) and the Member States published a "Coordinated Plan on Artificial Intelligence" on the advancement of AI in the EU. Later in 2020, the EC presented a White Paper proposing a framework for trustworthy AI based on excellence and trust. On April 2021, the EC proposed the first regulatory proposal on artificial intelligence, the "AI Act", with the aim of establishing the conditions for the development and use of reliable AI practices across the EU. The AI Act adopts a risk-based approach, setting out a number of obligations for AI system providers depending on their risk profile. Suppliers of high-risk AI systems (including those that pose risks to fundamental rights, health and/or human safety) will have to meet specific requirements regarding risk management, data and data governance, technical documentation, record-keeping, transparency, and provision of information to users, human oversight, accuracy, robustness, and cybersecurity. The regulatory text, however, does not explain how to fulfil these requirements on a technical level. Instead, it defines high-level essential requirements to protect public interests and provides for the creation of harmonized European standards necessary for products to comply with these requirements. Such standards will be produced by European Standardization Organisations (ESOs) and will provide the presumption of conformity with legal requirements and thus play a key role in ensuring a level playing field for all IA providers, as well as in simplifying the conformity assessment procedure. Therefore, while the negotiation of the legal text between the European Parliament and the Council was progressing, the EC sent a formal mandate to the ESOs to provide a comprehensive set of standards in support of the implementation of the AI Act. As the mandate itself outlines, the set of technical requirements in support of the AI act should be significantly based on international work. Most of the standardization activities are expected to come from ISO and IEC, given their prominence and existing agreements that make their adoption easier in the European context. However, despite the significant ISO/IEC standardization work currently underway in the Joint Technical Committee (JTC) 1/SC42 on AI, there are still many gaps to be covered to fully meet the requirements of the AI Act. Therefore, the JRC Technical report suggests analyzing the existing standardization landscape on AI of other important European Standards Development Organisations (SDOs) to see if there are specifications that can fill these gaps.

10.1.2.2 Non-functional characteristics

10.1.2.2.1 What is holding back artificial intelligence adoption in Europe?

Date of the review	28.02.2023.
Name of the project or initiative/report reviewed	What is holding back artificial intelligence adoption in Europe?
Project Owner/Author	Mia Hoffmann and Laura Nurski
Link to the project or any useful documents	https://www.bruegel.org/sites/default/files/wp_attachments/PC-24-261121.pdf
Main functionalities delivered by the project/Main points covered relevant to SMEs	

The Report illustrates the challenges in successful AI adoption in Europe, particularly for SMEs. According to the authors, the main obstacles are the following: • Financial constraints: the lack of external and/or public funding is particularly challenging for SMEs, in view of the lower resource endowment and tighter credit constraints faced by them. In this regard, SMEs would have more incentives to adopt AI technologies if there were tax deductions or subsidies to support their uptake (p.12-17) • Skills constraints: SMEs report skills shortage as a barrier, they perceive the lack of skills among their existing workforce as a factor hindering AI adoption (p. 12) • Data barriers: SMEs report that the lack of availability of internal data sources is another barrier preventing them from adopting AI, since without internal data it is not possible to adapt AI algorithms to specific tasks. (p.12-17) • Lagging digital transformation: both skills constraints and data barriers arise from a low level of digital transformation. SMEs lag far behind in the basic digitization of internal processes; therefore, they lack availability of IT infrastructure and data management skills in the workforce, but also do not have access to the data and computing power needed to integrate AI into their businesses (p.12-17) To foster AI adoption, the authors suggest that policymakers should: • Enhance learning opportunities for adults (both employed and unemployed) and make data skills part of educational programmes (p.17) • Provide tax deductions or subsidies supporting the acquisition of AI technologies and related services (p.17) • Promote the digitization of businesses (including the collection of business data) and support the investment needed to improve the technological readiness necessary for the adoption of AI (p.17)
Summary note
Artificial intelligence (AI) is seen as a major driver in future economic development and is foreseen to increase both labour productivity and economic growth worldwide. Despite uneven data collection and lack of taxonomy of it, it is quite clear that AI adoption in Europe is running low and far behind other parts of the world. When it comes to integrating AI into their operations, companies find several barriers preventing them from adopting AI technologies. The main barriers identified in the research are the lack of data and skills resulting from a lagged digital transformation and financial constraints. Although there is evidence that both large firms and SMEs recognize these as the main barriers to AI adoption, there are nuances, based on company size, in how these barriers affect them. In fact, SMEs report higher internal barriers, while large firms report higher external barriers in terms of skills and data. In light of this, the AI uptake will only grow if policymakers succeed in easing constraints and removing barriers that prevent companies from adopting AI technologies.

10.1.2.3 SME feedback and recommendations from the AI4EU platform open call

10.1.2.3.1 AI4EU Deliverable D3.2 Report on collected user requirements

Date of the review	27.02.2023.
Name of the project or initiative reviewed	AI4EU Deliverable D3.2 Report on collected user requirements
Project Owner	AI4EU
Link to the project or any useful documents	https://www.ai4europe.eu/

Main functionalities delivered by the project/Main points covered in relation to SME needs
The Deliverable identifies a common concern is how to become more data driven. Therefore, the Deliverable proposes Machine Learning (and other AI methods) as a potential solution (p.7), and the user personas were chosen based on their connection with machine learning processes and their different stages (p.10). As the AI-on-Demand platform could provide tools that offer assistance in deciding which methods to use, the interviews contributed to the development of an understanding of user needs with regard to support in developing and deploying machine learning applications and thus further development of the platform itself (p.35). It is reported that in the interviews a lot of attention was paid to the data collection and data cleaning stages, model training and model evaluation stages, support tools for data preparation stages of the workflow. Other suggestions and remarks by the interviewees included: • Fast iteration and rapid exploration of various features derived; • Testing new features with existing features to test their usefulness; • Importance of selecting the criteria/model that best optimizes the business objectives and provides support for real-time training, as well as making use of small datasets in training; • Tool support is needed for testing out models rapidly, on a mobile phone or a physical object; • A repository for many data sources, visualization features with statistical analysis tools, and provisioning of pre-trained models to do transfer learning, as well as features to explain models and results (analysis). Lastly, it was also reported that the research revealed one person might have different personas in several stages of the ML workflow. This is particularly prevalent in companies with a small number of employees due to the lack of resources (p.36).
Review summary note
The AI4EU Deliverable is a result of a research aiming at collecting requirements for potential future users of the AI4EU (AI-on-Demand) platform. The requirements are presented as a set of user stories, and they were created to guide the direction of further development of the platform. The Task leaders defined user groups through personas, that are deemed to be the typical users of the AI-on-Demand platform, particularly focusing on the technical platform, supporting users in different stages of creating and deploying machine learning models. Consequently, the consortium partners chose to explore the following types of personas: Application Developer, Data Engineer, Data Scientist and Business Analyst (Data Citizen). To gain the necessary overview on the user requirements, the task participants carried out a set of research activities such as a literature review and hands-on experiences with existing open and proprietary ML platforms; semi-structured interviews with 21 carefully selected informants, and a survey with more than 300 responses from possible platform users/stakeholders. The report resulted in a definition of user stories that were grouped in a set of epics tied to stages of the machine learning workflow and made available in JIRA. It was noted that it was needed to develop knowledge about hardware and software architectures and core capabilities of both commercial and open-source AI platforms (e.g., Acumos) and build a unique value proposition for the AI-on-Demand platform.

10.1.2.4 SME feedback from similar ai initiatives

10.1.2.4.1 GPAI field test

Date of the review	08/03/2023
Name of the project or initiative / report reviewed	GPAI field test
Project Owner / Author	Hub France IA
Link to the project or any useful documents	https://www.gpai.ai/projects/innovation-and-commercialization/broad-adoption-of-ai-by-smes/
Main functionalities delivered by the project / Main points covered in relation to SMEs	

Objective: Test a platform for SMEs wishing to launch an AI project to enable them.
Among other things: to find the best AI Service Provider (AISP) to develop the project and to identify use cases relevant for their activities and business.
 	
• STEP 1 - Invite pre-selected AISP on the platform to:
  ○ Fill a qualification survey (SPMind)
  ○ Participate to an in-depth audit interview to validate their registration on the platform
  ○ After having completed these steps, each selected AISP completes its profile and submits use cases.
• STEP 2 - Invite identified SMEs on the platform to:
  ○ Fill a maturity survey (AIMind)
  ○ Search for use cases related to their business problems and activities
  ○ If a use case is found, contact directly the AISP	

Review summary note	
• Both SME and AISP appreciated the offered platform and the ease of use • SMEs find AIMind questionnaire is very relevant to assess the level of AI maturity • Difficulty for AISPs to fill the SPMind alone => Importance of the interview • Difficulty for SMEs to find use cases => Importance of having an efficient search function **Results & Stats:** • 20 AISP filled the SPMind • 16 AISP participated in the interviews • 15 AISP completed their profile • 22 use cases uploaded • 15 SME filled the AIMind • 9 online feedbacks from SMEs • 6 online feedbacks from Providers but most of them give their feedbacks during the interviews	

10.1.2.4.2 PACK IA

Date of the review	08/03/2023
Name of the project or initiative / report reviewed	Pack IA

Project Owner / Author	Hub France IA
Link to the project or any useful documents	https://www.packia.fr/
Main functionalities delivered by the project / Main points covered in relation to SMEs	

The Pack IA program was launched at the end of 2019 by the Ile de France region and is still operational.
Objective: Accompanying SMEs and medium-size companies to grow their AI maturity through practice. Pack IA allows eligible regional companies to receive 50% support for a 3-months AI project with a maximum budget of €37k. The expected deliverable is an MVP taking into account the technical constraints of the SME
• STEP 1
  ○ Sourcing of SMEs and medium-size companies at regional level
  ○ Conduct a first meeting to identify the high impact AI topics for the company: turnover, cost reduction, hiring and achievable within the timeframe and budget defined by the program
  ○ Identify one or several referenced AI service providers able to develop the project(s)
• STEP 2
  ○ The company selects the AI service provider among those proposed
  ○ The service provider finalizes the project definition
  ○ The project is validated by the consortium (HFIA, Teralab, B&D, Quantmetry) in charge of the program for the region
  ○ The co-pilot of the program (HFIA) monitors the project on a monthly basis to ensure it is running smoothly within the deadline
  ○ At the end of the project, the company and the AI service provider must submit a summary of the activities and results of the project. Emphasis is placed on the follow-up to the project and the expected impacts	

Review summary note	
Results & Stats • 70 projects have been funded • All sectors: Banking-Insurance; Construction; Industry; IT & Networks Entertainment; Mobility; Retail and e-commerce; Human Resources; Health; Tourism • Mostly small companies have been funded: average number of employees: 186. 45 companies with less than 50 employees were funded.	

10.2 Public bodies

10.2.1 Requirements

Overall, the administrations involved in the survey show that the AI-on-Demand platform is expected to fulfil several needs of public bodies when dealing with AI. Below, the analysis of the survey results, consolidated by the findings emerged during the one-to-one interviews and focus groups.

AI aware public bodies need mostly **technical tools and support in handling and using data**. Advanced and basic trainings are also required. **AI unaware** public bodies need mostly **access to services and funding programs**. Information about **jobs or events** is instead not considered a priority for the public sector.

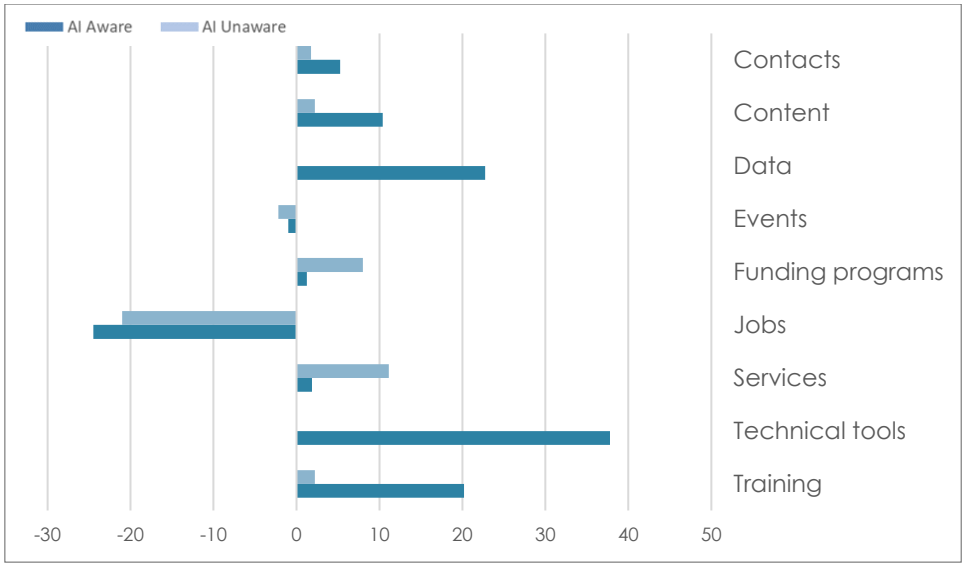
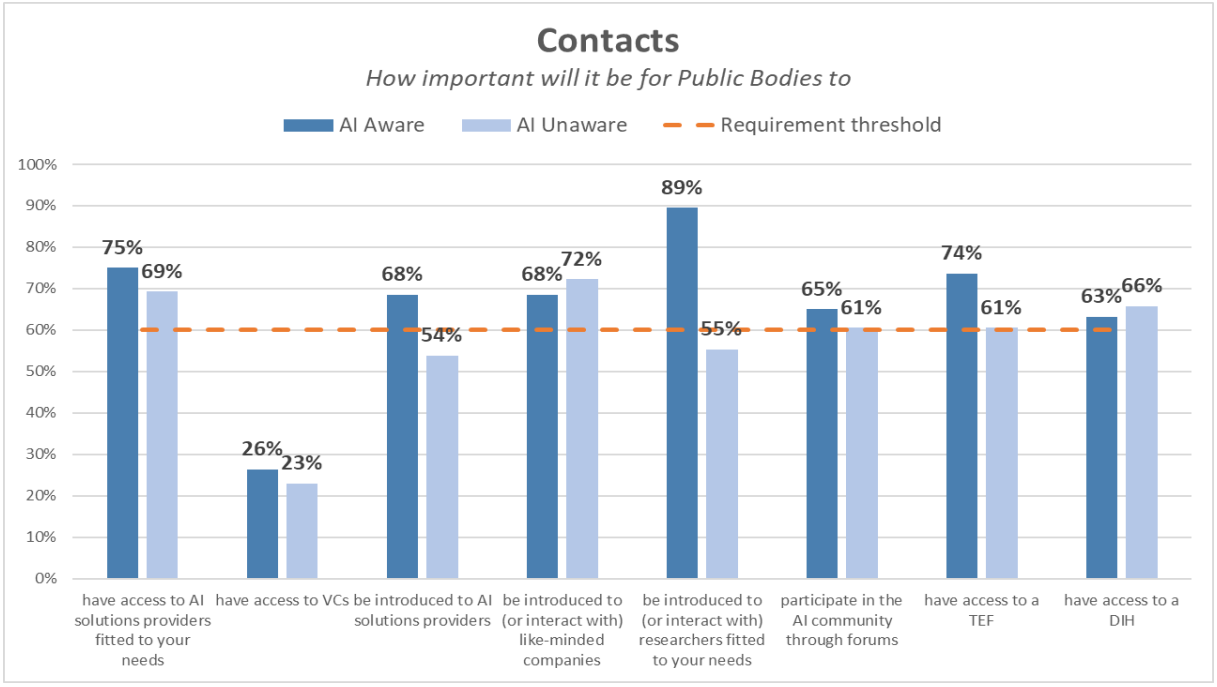


Figure 7 - Average distance from the requirement threshold (0 = 60% of positive replies), by category (unit of measurement in percentage points)

10.2.1.1 Contacts



Public bodies are in need of establishing contacts to a **large extent**. Among the several types of contacts that the platform could provide, the following are considered the three most important types of contacts:

- for **AI aware** respondents to be introduced to **researchers** fitted to their needs (89%); have access to **AI solutions providers** fitted to their needs (75%) and have access to a **TEF** (74%).
- **AI unaware** respondents instead would prefer to be introduced to **like-minded companies** (72%), to have access to **AI solution providers** fitted to their needs (69%) and finally, to have access to a **DIH** (67%).

Being put in contact with Venture Capitalists is not considered a priority, and the public sector finds as most useful to be introduced to researchers or interact with like-minded companies.

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- In general, the feedback gathered during the consultations reflected the results of the survey: having access to contacts is important to a large extent and the only category deemed as less relevant is “being put in contact with Venture Capitalists”
- IT/AI expertise is quite often outsourced to private companies to support the Public Sector
- Several public sector officers would find it useful to have a database of AI providers, which confirms the survey result: more than 70% of respondents would like to be put in contact with AI solution providers
- Contacts with other public administrations is also considered useful, to have a strong feeling of belonging to an AI community, but also to communicate easily on what is considered more important, given that AI is developing at a fast pace. More importantly, being in contact with other administrations and their experience in using and developing AI can also provide valuable insights on how to proceed and bad practices to avoid. More than half of survey respondents indeed would like to participate in the AI community through forums

Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

“The PA officer needs to liaise with other departments and offices that already have implemented similar systems and capture any insights or blueprints to be used as a reference scenario for their specific case”

National public body from Spain consulted by the AI4GOV Master’s students

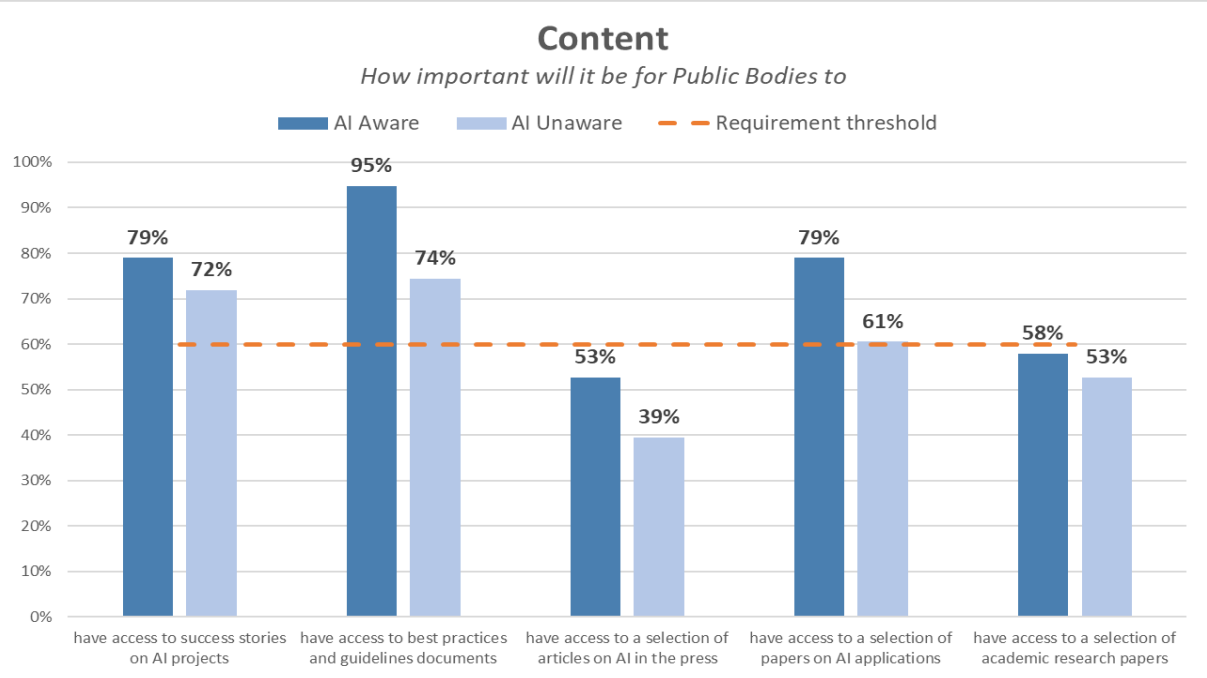
“Contacts are always useful, to get an idea of the directions the market is heading, however contacts at the national level would be more useful than those at EU level”

Local public body from Italy consulted during an interview

“We would like the platform to also assist with peer-to-peer contacts for EU AI Regulatory Sandboxes”

National public body from Portugal consulted during the National Focus Group

10.2.1.2 Content



Broadly, public bodies need content to a **moderate extent** and in this category, AI aware and AI unaware respondents share the same needs. Two types of content are considered as the most relevant: **best practices and guidelines documents** (95% and 74%, respectively) and **success stories on AI projects** (79% and 72%). Having access to neither a selection of articles on AI in the press nor academic research papers is considered relevant to have on the platform as it did not reach the requirement threshold.

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- In general, consultation with stakeholders confirmed the survey results. The content category is important, however to a certain extent. There is a shared feeling that other existing channels (platforms, newsletters, etc.) are already providing the necessary content
- The quality of the content made available matters. A representative of a regional public body expressed the need for quality checks as they feel overwhelmed by content, and therefore wasting a lot of time trying to assess what is worthy and what is not
- Success (and failure) stories must be comparable to the reality of the public sector body researching them
- In line with the survey results, the feeling of the consulted stakeholders is that press articles and academic articles are not as useful and all the existing newsletters already cover that. Having them on the AI-on-Demand platform as well would be a repetition
- The need for Use Cases/Case Studies is transversal for all the interviews conducted, in terms of adopted and applied, vision, actions, method, data, experienced results, lessons learned and room for growth

Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

*"It is always helpful to see experiences of other individuals so as to generate new ideas. Suggestions arise from each proposal/experience. Comparison is always an important stimulus; however, we need a quality screening so that we are able to **quickly** discern whether the project/provider/person is "worth it"/effective/reliable"*

Regional public body from Italy consulted during an interview

"The platform should include a comprehensive database of case studies and best practices regarding the implementation of AI-based solutions"

National public body from Cyprus consulted during the National Focus Group

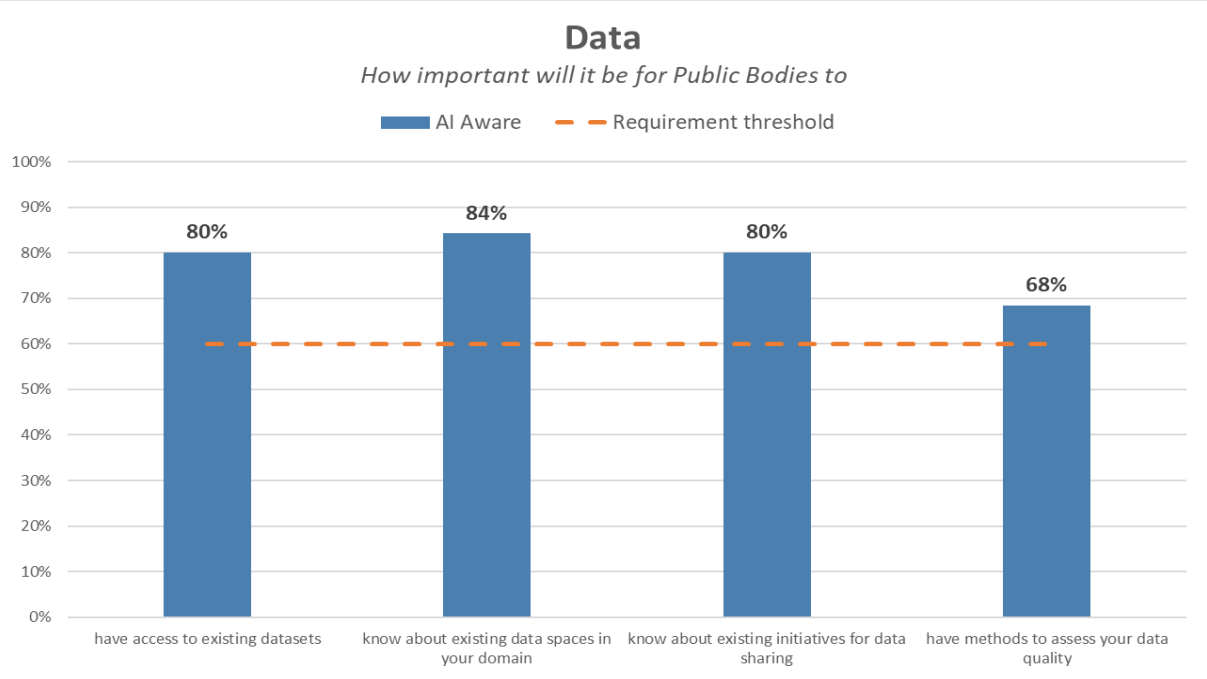
"People sharing experiences, giving coaching, lectures with real hands on or hackathons using AI on the platform. it's important because it may save you more time that those that you will spend in organize these activities."

National public body from Slovenia consulted during the National Focus Group

"Papers too theorical and complicated. We need experiences from other administration, providing methodologies, steps."

National public body from Spain consulted during the National Focus Group

10.2.1.3 Data



The respondents considered having access to data on the platform as important to **a very large extent**, every type of data was ranked at least 8 percentage points above the requirement threshold. This category concerns only AI aware public bodies, which consider of high importance to have access to existing datasets (80%); know about existing data spaces in their domain (84%); know about existing initiatives for data sharing (80%) and have methods to assess data quality (68%).

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- In general, the need for data emerging from survey results was confirmed by consultation with stakeholders, many of whom identified lack of data quality and accessibility to data as the main challenges in adopting AI
- There is an overabundant supply, but the data is not very usable. They do not find pre-defined packages of data useful
- Some of the stakeholders consulted during focus groups fear that privacy laws in place would prevent them from accessing data coming from other organisations

- Local public administrations play a vital role as data providers by collecting, generating, and managing vast amounts of region-specific data. They are considered more user-oriented and closer to their constituents, emphasising the importance of purposeful and user-centric open data publishing to ensure reusability and impact
- During the Regional focus group all the needs identified as priority in the survey were strongly confirmed: from having access to existing data bases to the sharing of knowledge on methods to assess the quality of the data.

Quotes extracted from the consultation (interviews and focus groups) with stakeholders

"The AI-on-Demand platform could act as a selector for those public bodies who need to integrate administrative data with IT data and save them time and effort."

Regional public body from Italy consulted during an interview

"It's important to develop solutions and then share it open source for all the public sector bodies interested."

National public body from Sweden consulted during an interview

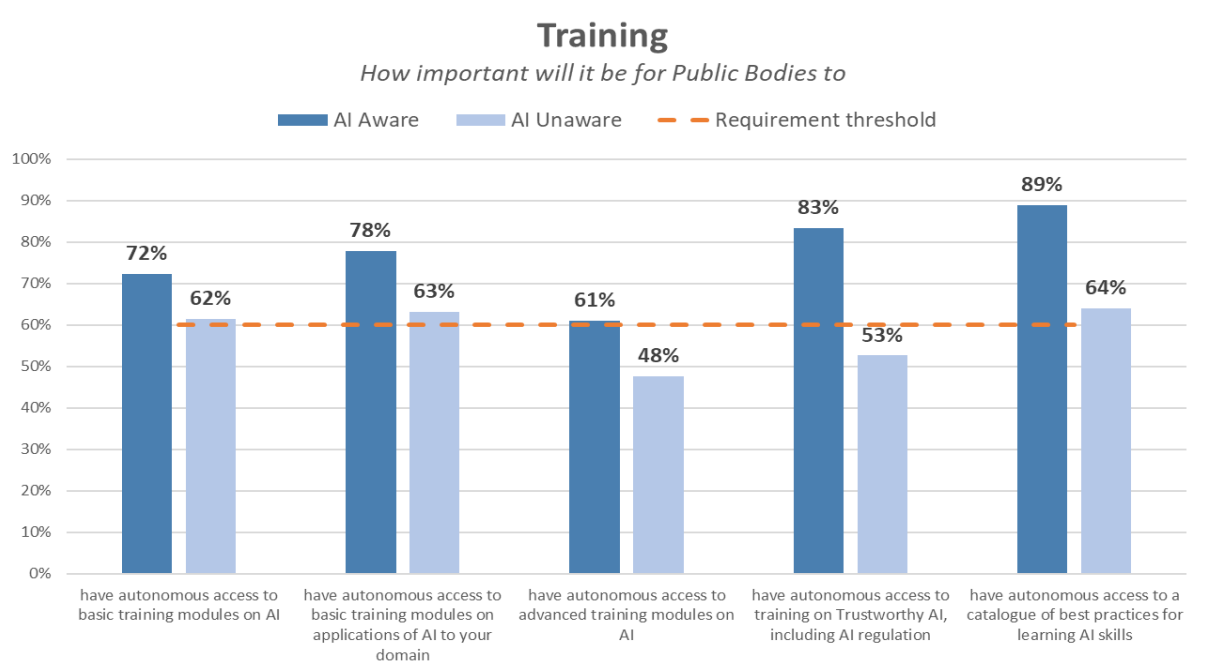
"Use of open and private data to fully use the potential that ML could grant to the public sector, with an emphasis on reducing discriminatory, historical, racial, and gender bias from AI decision-making"

National public body from Cyprus consulted during the National Focus Group

"On the data side, I think there is work to be done not only on Interoperability but also on Governance Models, namely ones develop to share data and made them available"

National public body from Portugal consulted during the National Focus Group

10.2.1.4 Training



Have autonomous access to training modules is considered important to a **large extent** with different priorities between AI aware and AI unaware administrations. According to **AI aware** public officers, it is important to have autonomous access to **best practices for learning AI skills** (89%), **training on Trustworthy AI, including AI regulation** (83%) and **basic training modules** (78%). **AI unaware**

respondents instead gave priority to **best practices for learning AI skills** (64%), and **basic training modules** (68%).

The highest ranked requirement (89%) is to "have autonomous access to a catalogue of best practices for learning AI skills", closely followed (83%) by "have autonomous access to training on Trustworthy AI" which highlights the necessity to learn about the experience of other administrations, but also an increasing interest for human-centric, trustworthy approach to AI in the public sector, in line with the EC's strategies and policies and the upcoming regulatory framework.

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- The need for training emerges clearly from survey results, stakeholder consultation and the analysis of the literature. The requirement ("have access to training on Trustworthy AI") was considered crucial also by stakeholders interviewed, who are particularly worried about the issue of bias in AI systems
- The market has already plenty of trainings offered. Public bodies would find most useful if the AI-on-Demand platform would curate a repository based on quality
- When the civil servants lack even the most basic competencies, purely technical courses would be hardly beneficial for the same reasons. In this sense, information is more valuable than training
- Training on data management, data governance and tendering procedures is considered valuable by many stakeholders interviewed

Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

"The AI-on-Demand platform could provide guidelines on what training is worthy and what is not, also my means of a seal of quality of training courses already available."

Regional public body from Italy consulted during an Interview

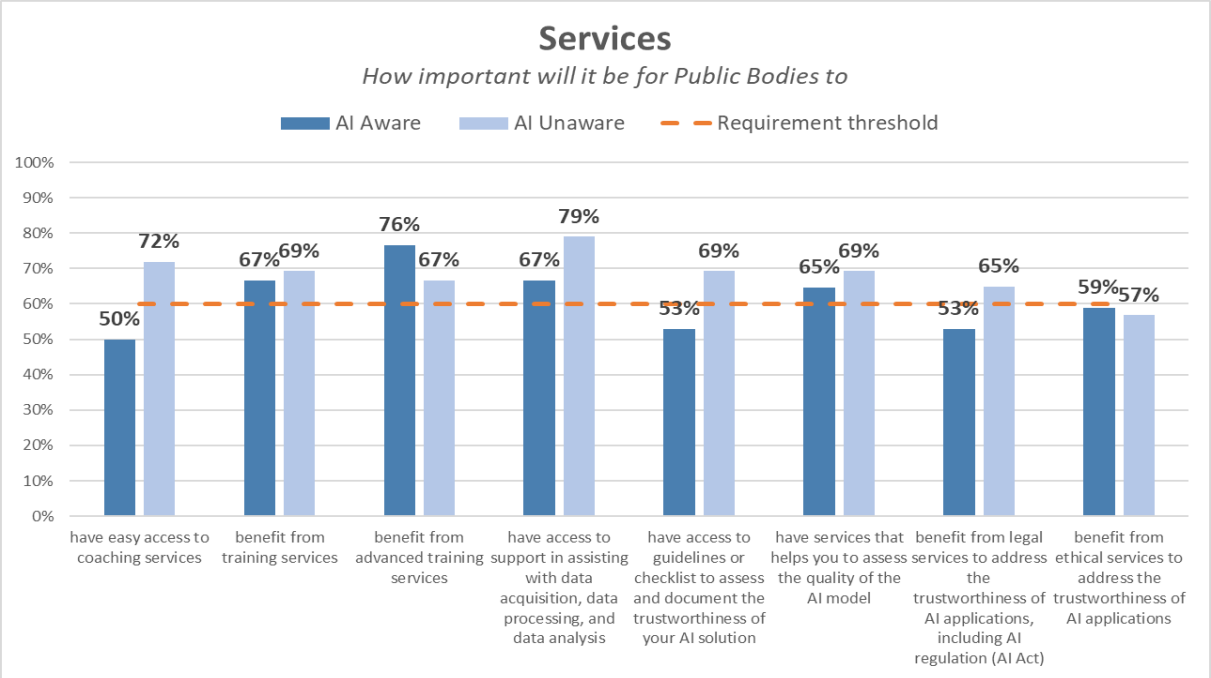
"Training should be thought of at different levels: e.g., one for people in technical departments, one for administrative people (e.g., mayor, council, executive). If administrative people do not know AI, they could hardly incorporate it into mandate objectives. Two levels of training: one strategic, one more "operational."."

Local public body from Italy consulted during an Interview

"As a CIO of a regional government, I want access to existing IT infrastructure resources and training materials to enhance our AI capabilities"

Regional public body from Germany consulted by the AI4GOV Master's students

10.2.1.5 Services



Access to services represents a **relevant need**, especially for AI unaware administrations. For AI aware respondents, the following type of services have priority: **training services** both basic and advanced (76%); **support in data acquisition, processing and analysis** (67%); **help in assessing the quality of the model** (65%). AI unaware respondents share approximately the same needs but adding also coaching services and guidelines to assess the trustworthiness of AI solutions.

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- In line with survey results, consultation confirmed the need for non-autonomous training services such as webinars, workshops etc., especially those devoted to the ethical issues of AI
- It is considered easy by the public sector to have access to people with legal expertise in AI, technology aspects, GDPR aspects; but also knowledge of the public sector and responsibilities. Also, they are expecting a serious lack of legal expertise following the passing of AI Act as the few experts working in the public sector may be poached by the more lucrative private sector
- The feeling gathered from the interviews is that there is already an abundance of service providers looking to sell knowledge and access to AI solutions to public sector bodies. Therefore, in order for the AI-on-Demand platform to provide unique value, the interviewees stressed the ability to experiment in a low-risk environment for both the individual AI models, but also the entire implementation process of an AI solution
- Public Administrations are not familiar with procuring AI-based services. Civil servants, advisors, and economists do not have the technical knowledge to write, procure and estimate the timeframe and budget of tenders. They would like to access success/fail stories related to the procurement of AI solutions by other PAs, at the same level of government or a higher one, possibly within the same country. More details on this need are provided in section 10.2.2.1.1.6.

Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

"Government agencies are actively looking for people with legal expertise focused on the upcoming EU regulation of the digital space (the AI Act)"

National public body from Sweden consulted during an interview

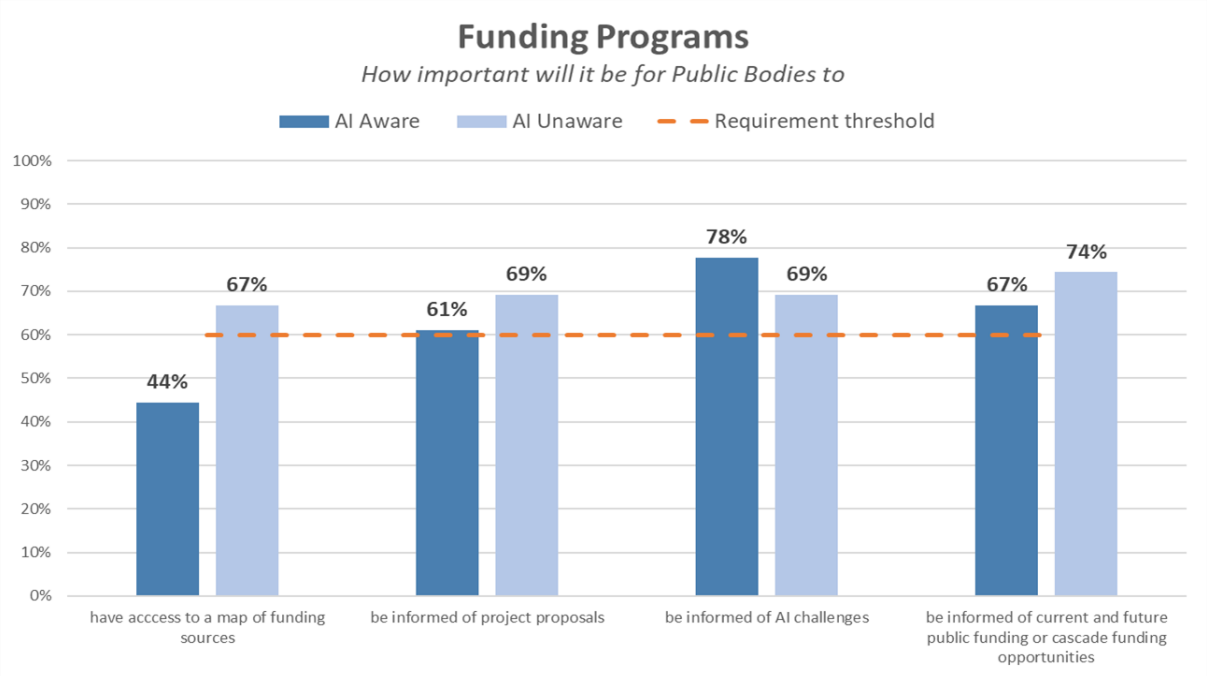
"What about a framework for the implementation of ethical principles to make sure that any discriminatory biases are avoided?"

Regional public body from Belgium consulted during the Regional Focus Group

"The AIoD platform could provide i) prediction capabilities counting approximately the budget for potential project according to the features and current success stories. This info is very preliminary and can be used to reason the importance, efficiency and capacity of the project and organisation, ii) analytics to calculate the risk index due to input criteria and provides main risks to be taken into consideration (general)"

Regional public body from Belgium consulted by the AI4GOV Master's students

10.2.1.6 Funding programs



Access to funding programs on the platform is considered relevant to a **moderate extent.** Both **AI aware and AI unaware share a keen interest** towards being informed about AI challenges (78% and 69%), project proposals (61% and 69% respectively), as well as funding opportunities (44% and 67%).

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- During the consultations with stakeholders, having access to funding programs and relevant news on the AIoD platform emerged as a more important need compared to survey results. This was particularly relevant for the regions participating in the regional focus group, considering the fulfilment of this need as crucial for growing and keeping evolving in the AI sector.
- The Public sector officers interviewed would rather have a clear view about where, what and how to apply for external funding

Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

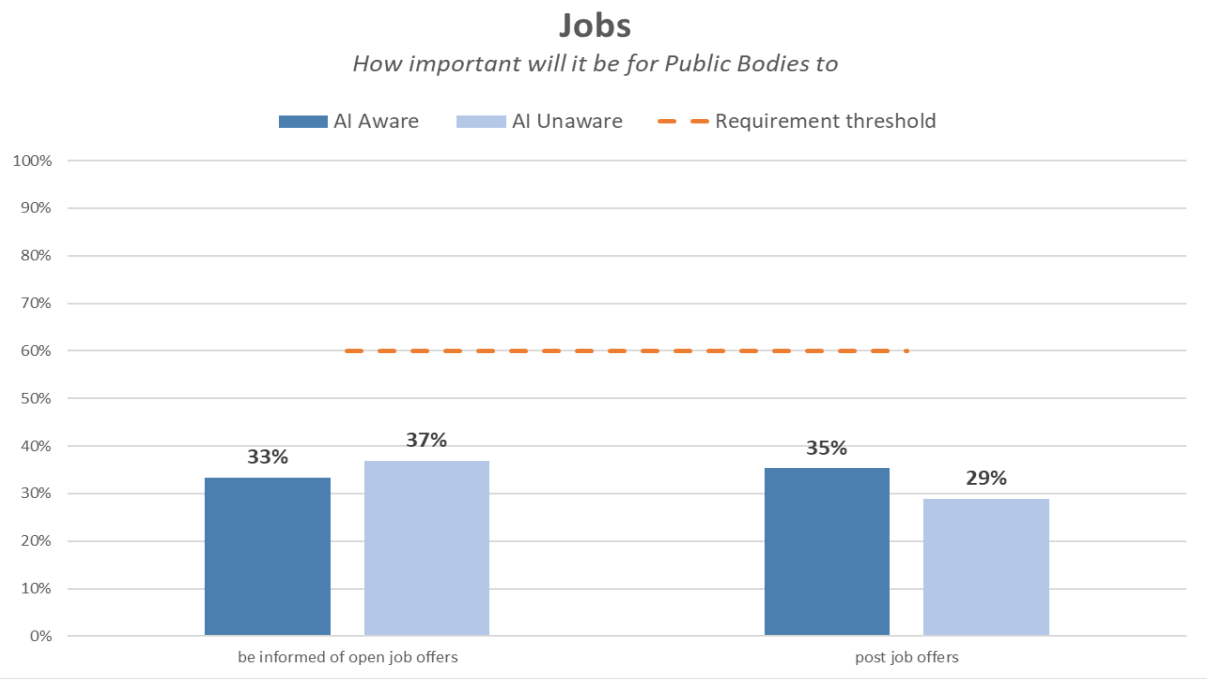
"Local administrations would find funding sources useful as ministries tend to have their funding well secured."

National public body from Italy consulted by the AI4GOV Master's students

"The AIoD platform should provide clear and up-to-date information about available funding opportunities for developing new AI projects/services. The PS officer wants to have a clear view about where, what and how to apply for external funding"

National public body from Spain consulted by the AI4GOV Master's students

10.2.1.7 Jobs



In general, being informed about open job offers or being able to post job offers does not seem something the public sector would consider valuable to have on the AIoD platform; both functionalities did not reach the requirement threshold nor for AI aware nor AI unaware respondents (38% and 39% and 33% and 29%). In fact, job recruitment in the Public Sector is highly regulated, given that public organizations must ensure transparency and fairness in their recruitment process, promoting equal opportunities and avoiding misconduct such as corruption or fraud.

Insights gathered from the consultation (interviews and focus groups) with stakeholders

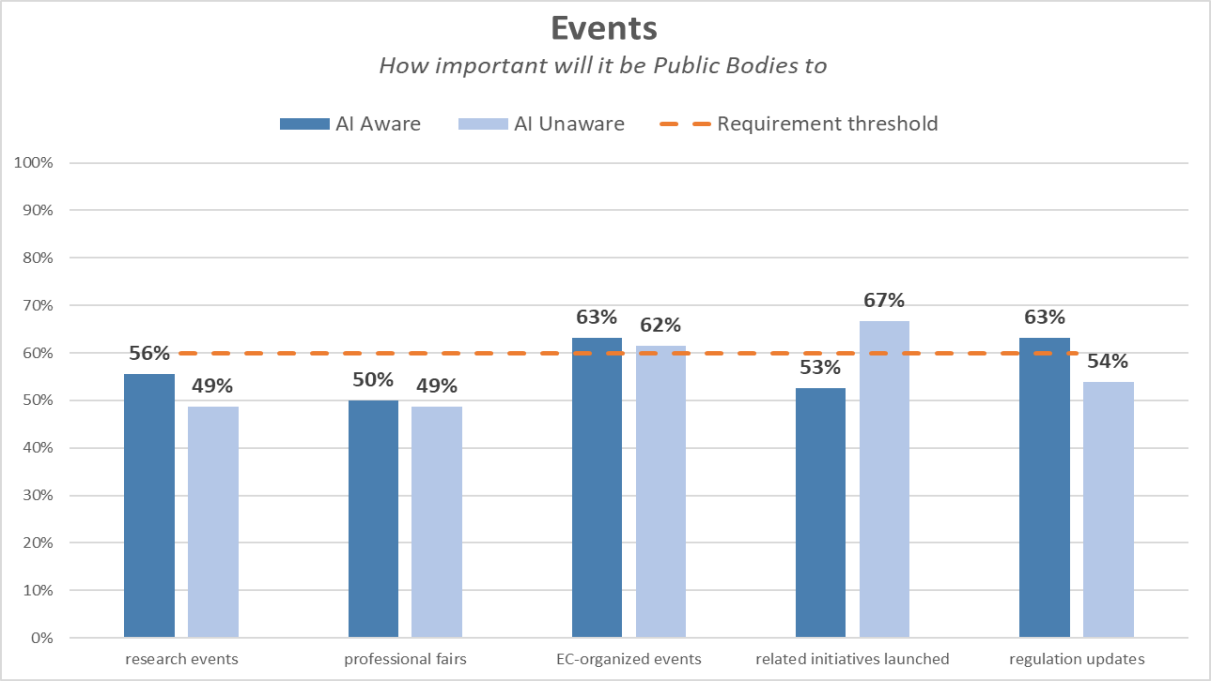
- Consultation activities confirmed the survey results, the participants interviewed did not consider the "jobs" functionality as something relevant to have on the AIoD platform
- The existing legislation would not allow most public bodies to post jobs on the platform, but it seems interesting for other actors

Quote extracted from the consultation (interviews and focus groups) with stakeholders:

"Being informed about existing job offers would be useful also to understand salary ranges"

Local public body from Italy consulted during an interview

10.2.1.8 Events



In general, having access to events on the platform is considered **important, however not a priority** as it is shown by the fact that almost all types of events are only slightly below the requirement threshold. The following are considered the most important types of events for AI aware respondents: regulation updates and EC-organized events (both at 69%). AI unaware respondents share the same need however with a different priority: they would like to be informed of related initiatives launched (67%); EC-organized events (62%) and finally, also regulation updates (54%).

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- The stakeholders interviewed expressed the need for promotion of events within the AIoD platform especially for PA officers/administrators to stay up-to-date on the latest developments in AI and connect with other professionals in the field
- Events also serve as a way to bring the community together

Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

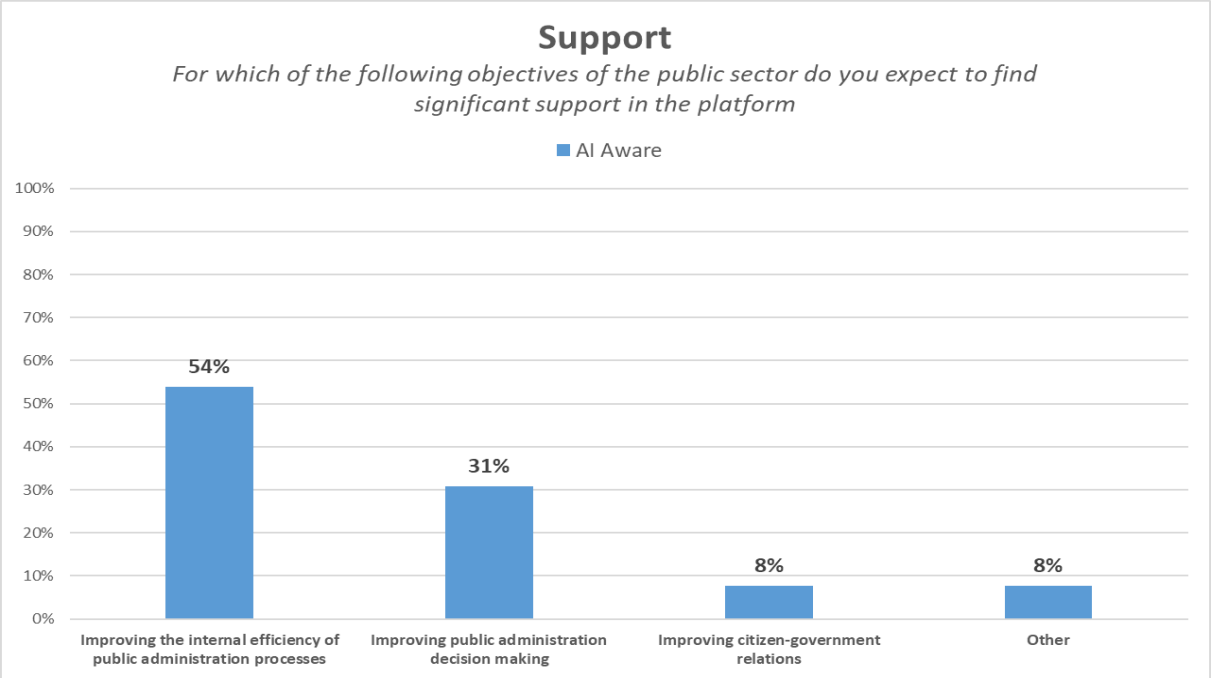
"Information about relevant events at the EU or national level (e.g., Info Days, Match-Making events, etc.) that can help the PAs connect with key stakeholders and establish collaboration opportunities."

National public body from Cyprus consulted during the National Focus Group

"Dedicate sessions/webinars could be organized on the AIoD platform with the "top rated AI use cases" to spread them further."

EU public body from Luxembourg consulted by the AI4GOV Master's students

10.2.1.9 Support



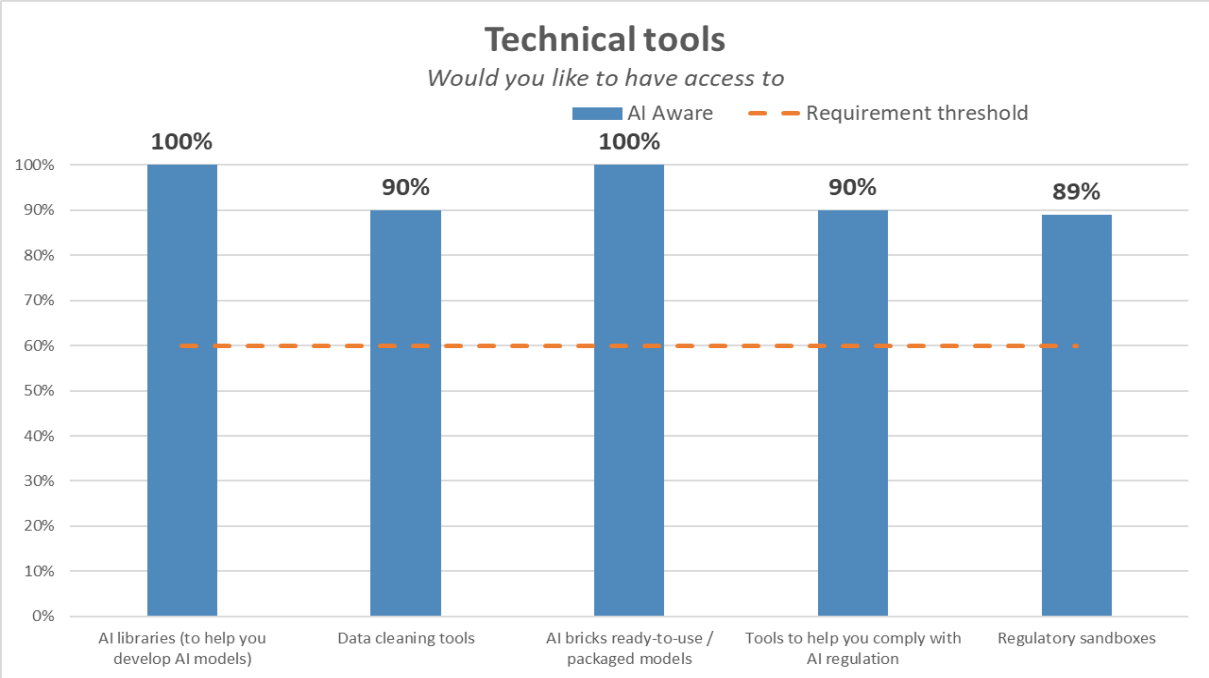
As expected, AI aware public sector bodies expect to find support in the platform in improving the internal efficiency of public administration processes (54%). They would also value support in improving public administration decision making (31%), and, to a lesser extent, in improving citizen-government relations (8%).

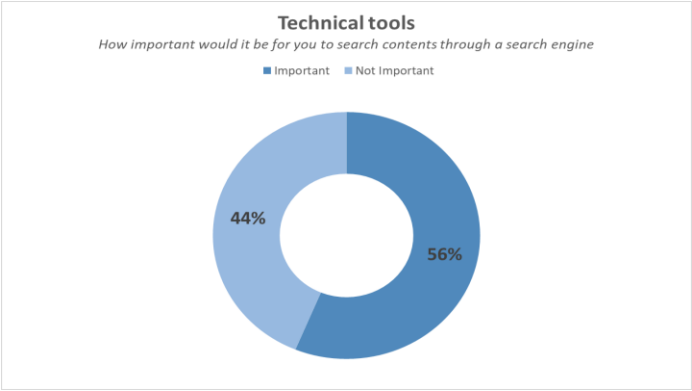
Quote extracted from the consultation (interviews and focus groups) with stakeholders:

"Having use cases on the platform would be helpful to learn how to improve the efficiency of internal processes"

Public body from Italy consulted by the AI4GOV Master's students

10.2.1.10 Technical tools





Generally, AI aware public sector bodies would consider important to have access to any type of technical tools, from AI libraries to regulatory sandboxes (all ranked above 89%). They do not seem to show a strong preference for being able to search contents through a search engine.

Insights gathered from the consultation (interviews and focus groups) with stakeholders

- Completely in line with survey results, the urgency of this need emerged also from consultation with stakeholders.
- The Italian Ministry interviewed is currently developing projects for a data warehouse and a data lake. So, it will be interesting to explore the possibility of using AI solutions for the analysis of such wealth of data
- Stakeholders expressed the need for a range of tools and resources that facilitate AI development, such as AI libraries, data cleaning tools, ready-to-use AI bricks, AI infrastructures for testing, compliance tools for AI regulations (e.g., EU AI Act), and regulatory sandboxes. These resources would enable public servants and AI practitioners to develop, test, and implement AI solutions effectively while ensuring compliance with relevant regulations

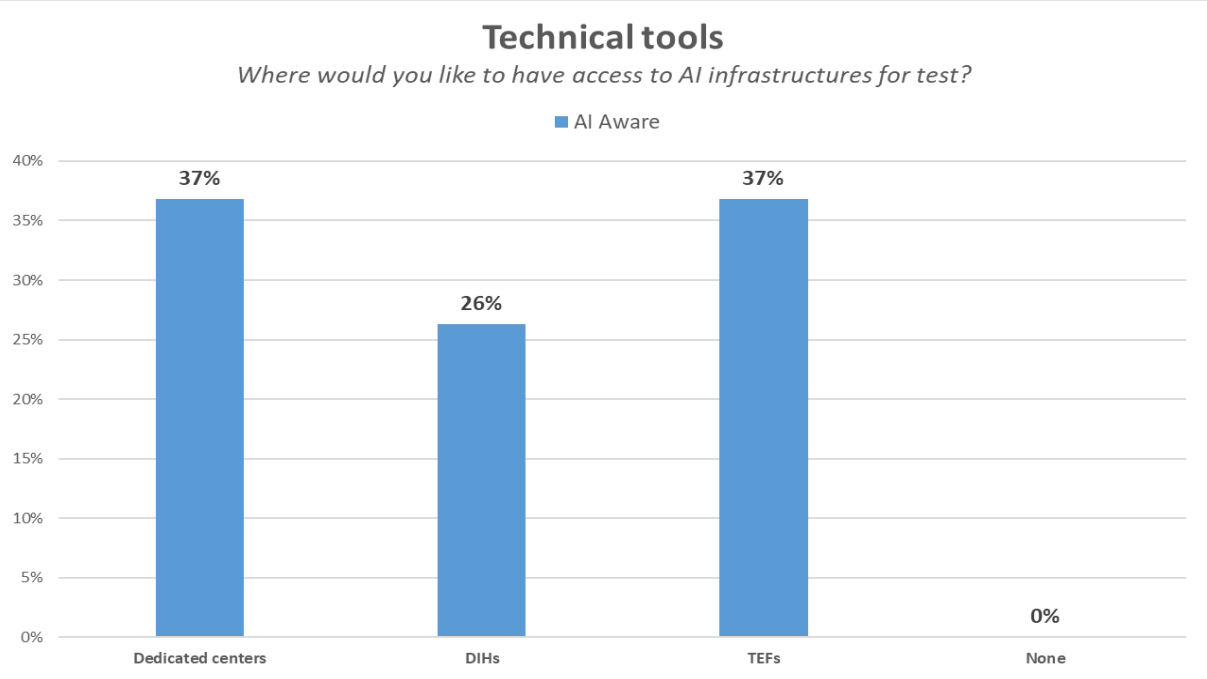
Quotes extracted from the consultation (interviews and focus groups) with stakeholders:

"NLP techniques applied to legal documents can aid in the identification of overlapping legislation"

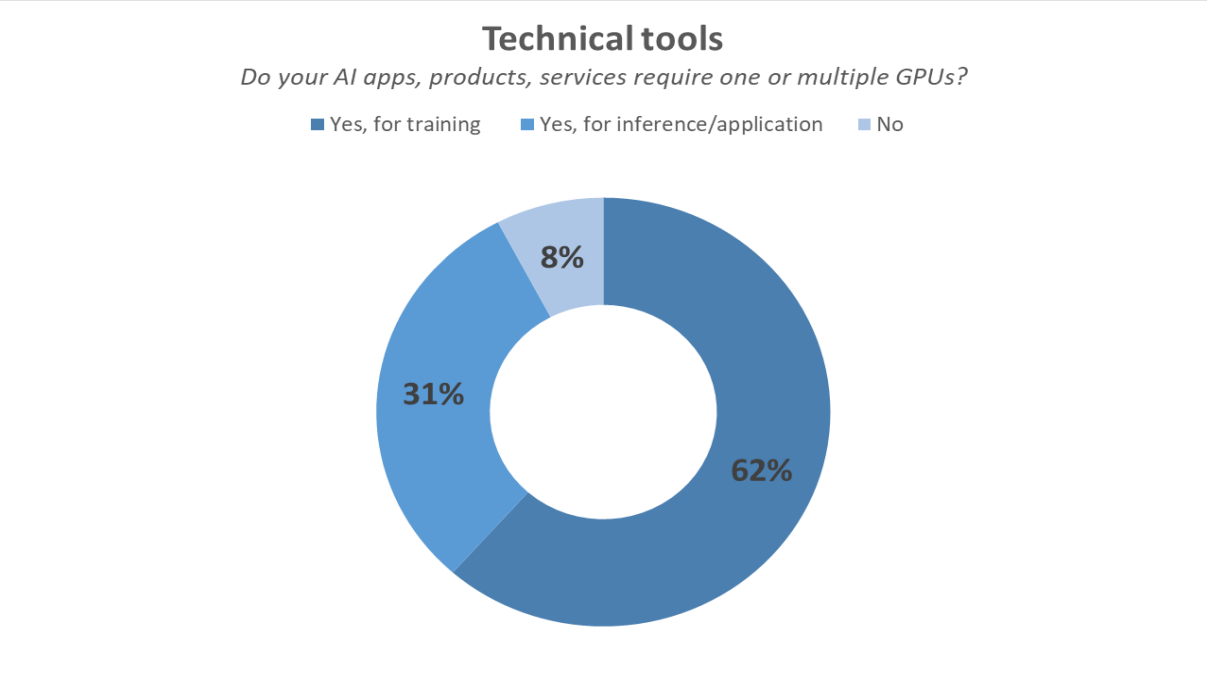
National public body from Italy consulted during an interview

"Search functionality is necessary, but the platform should also provide the option to match your needs to available resources"

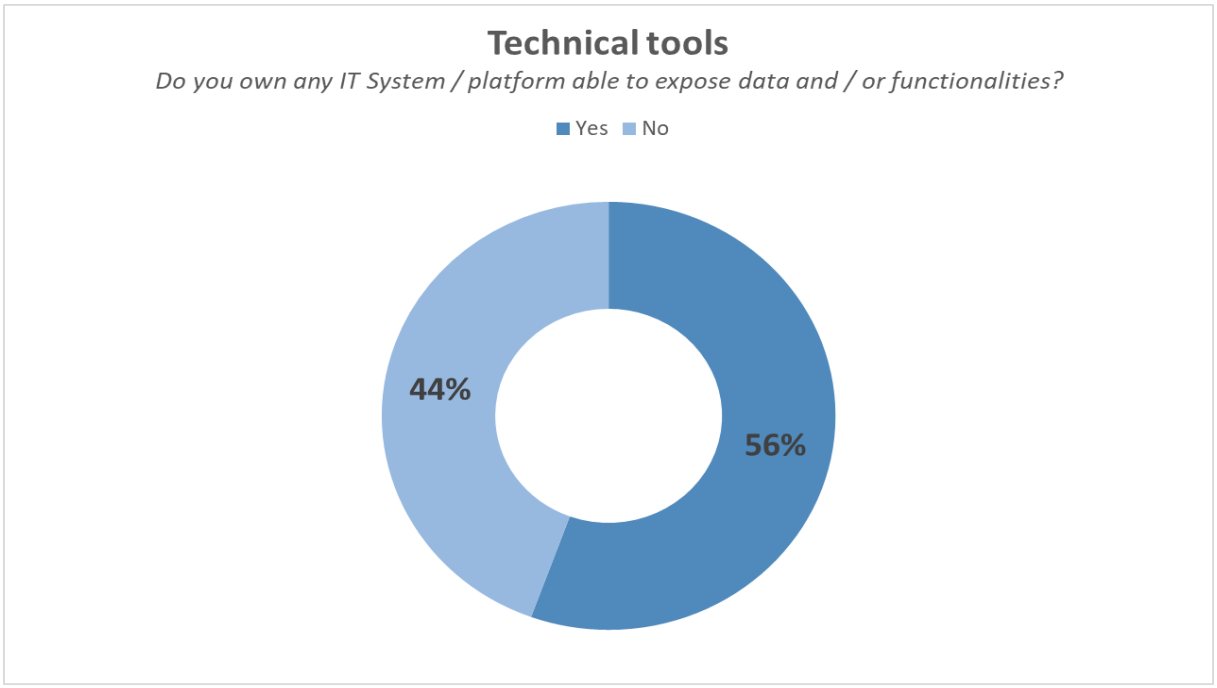
National public body from Slovenia consulted during the National Focus Group



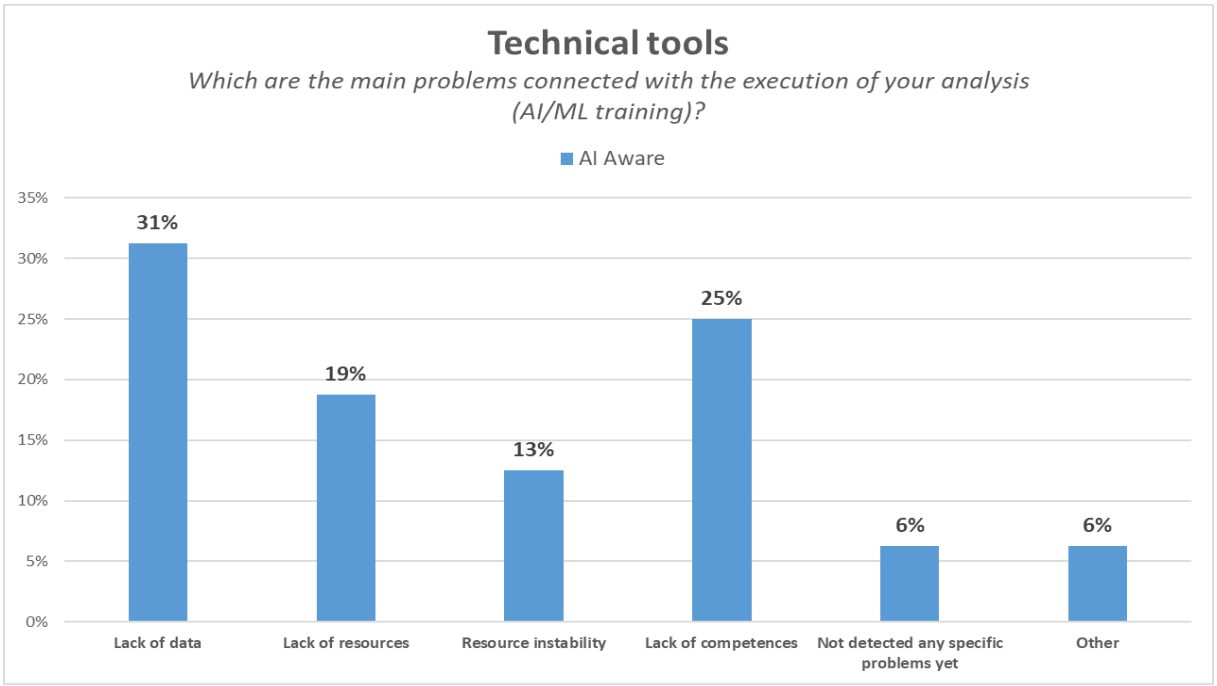
AI aware public sector bodies in need of an infrastructure for testing would prefer to have access to a TEF (37%), rather than a dedicated centre or a DIH (37% and 26% respectively).



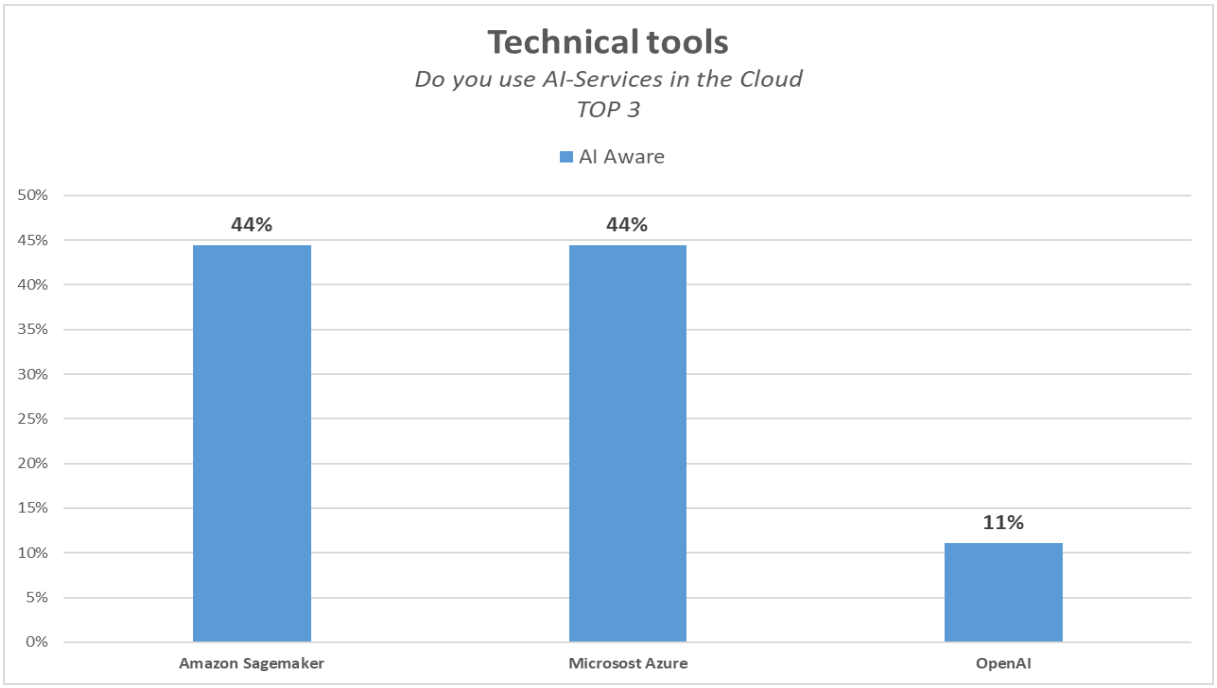
The majority (58%) of respondents uses AI applications, products or services that require one or multiple GPUs for training purposes.



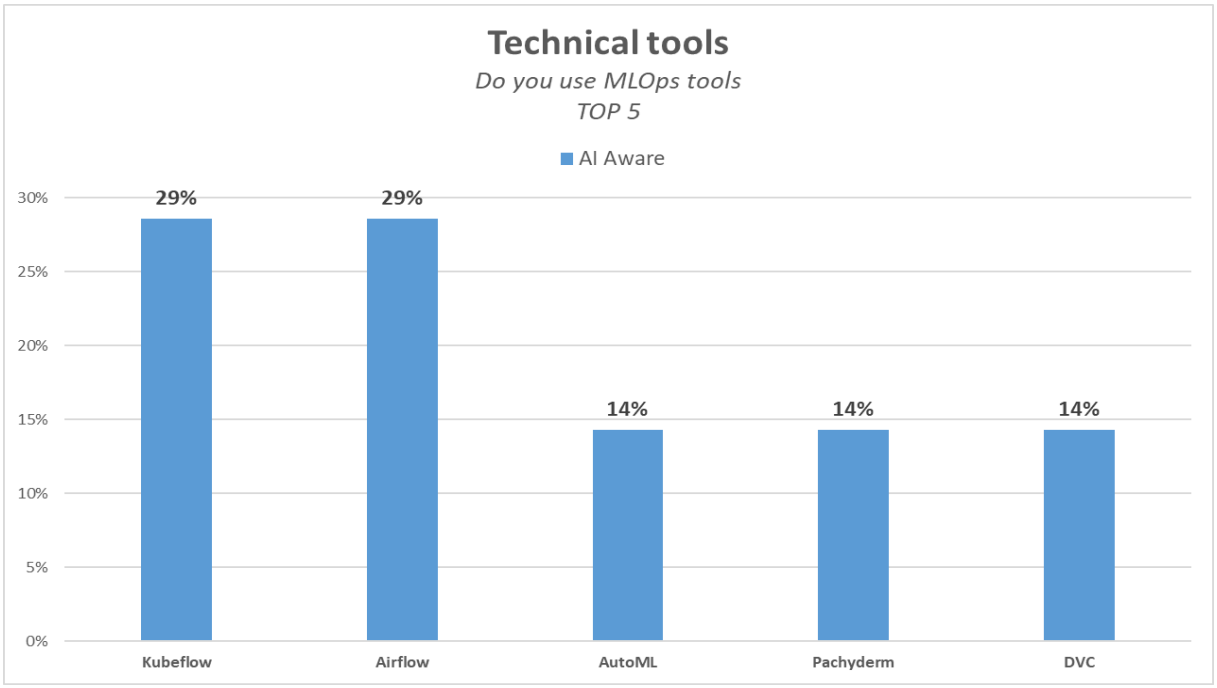
Public sector bodies are divided in the ownership of IT systems/platforms able to expose data and/or functionalities with slightly more half of them answering positively and slightly less than half of them answering negatively.



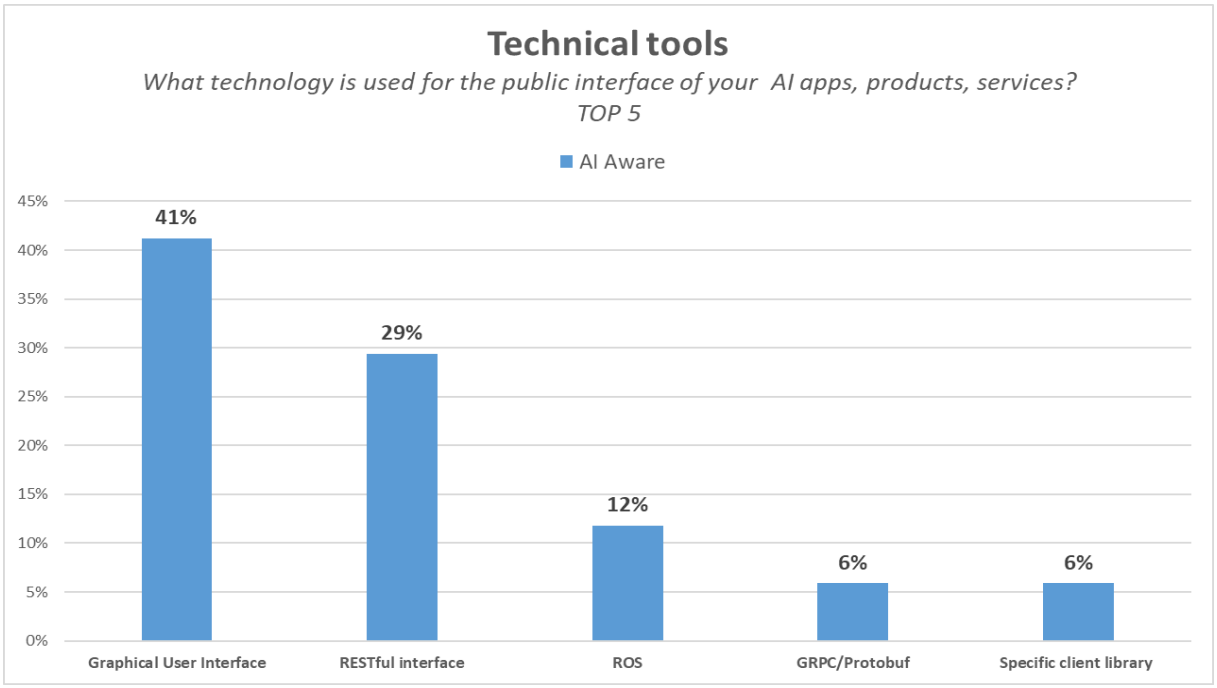
In line with the responses from other consultation activities, the main problems connected with the execution of data analysis for public sector bodies are the following: lack of data (31%) and lack of resources and/or competences (19% and 25% respectively).



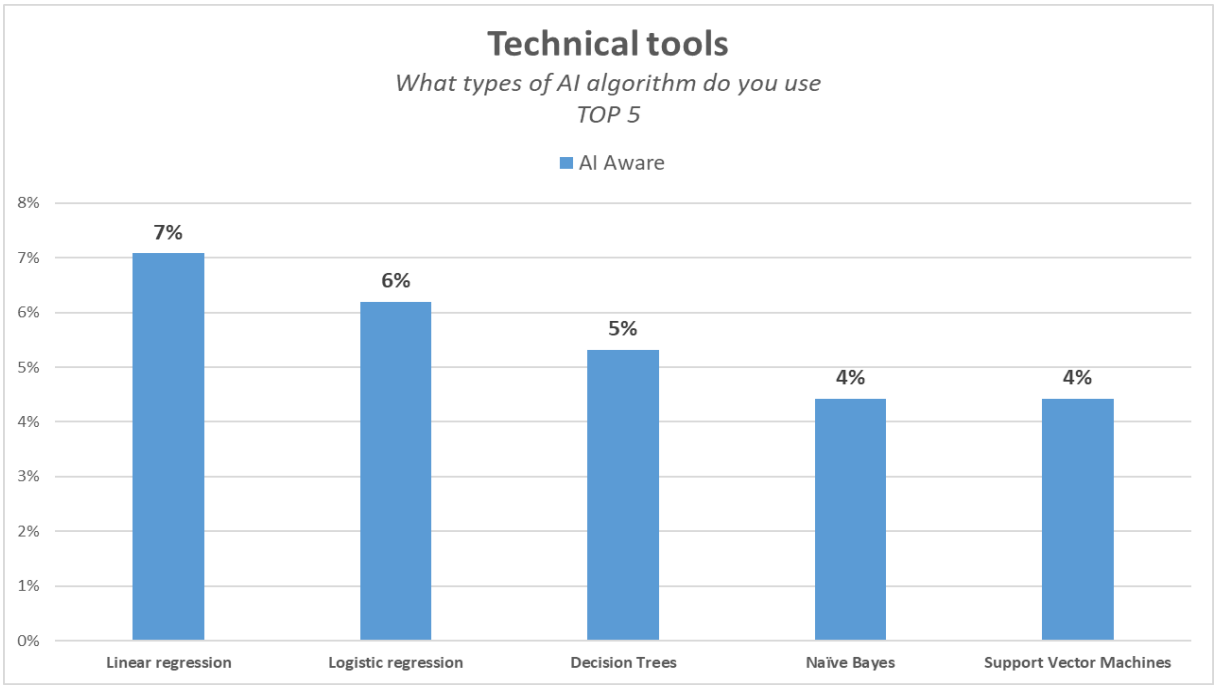
When using AI services in the cloud, public sector respondents use either Microsoft Azure (44%) or Amazon Sagemaker (44%).



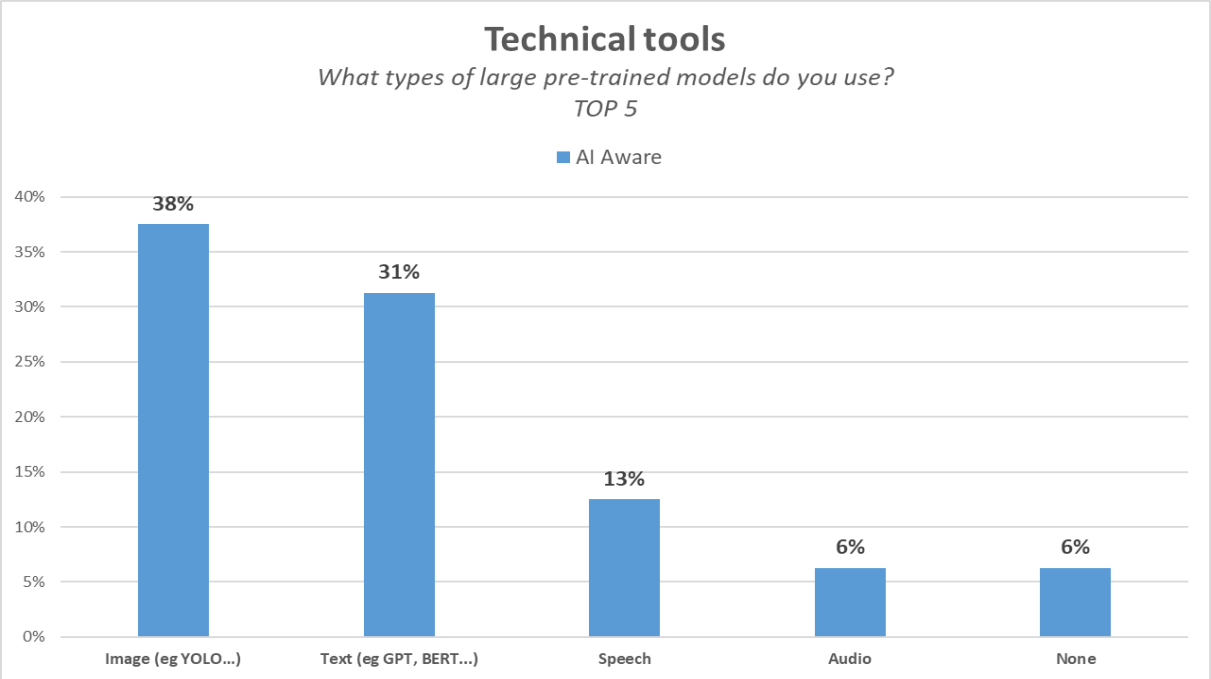
The five MLOps tools mostly used by public sector respondents are the following (in order of usage): Kubeflow and airflow (29%), autoML, pachyderm and DVC (14%), (7%) and DVC (7%).



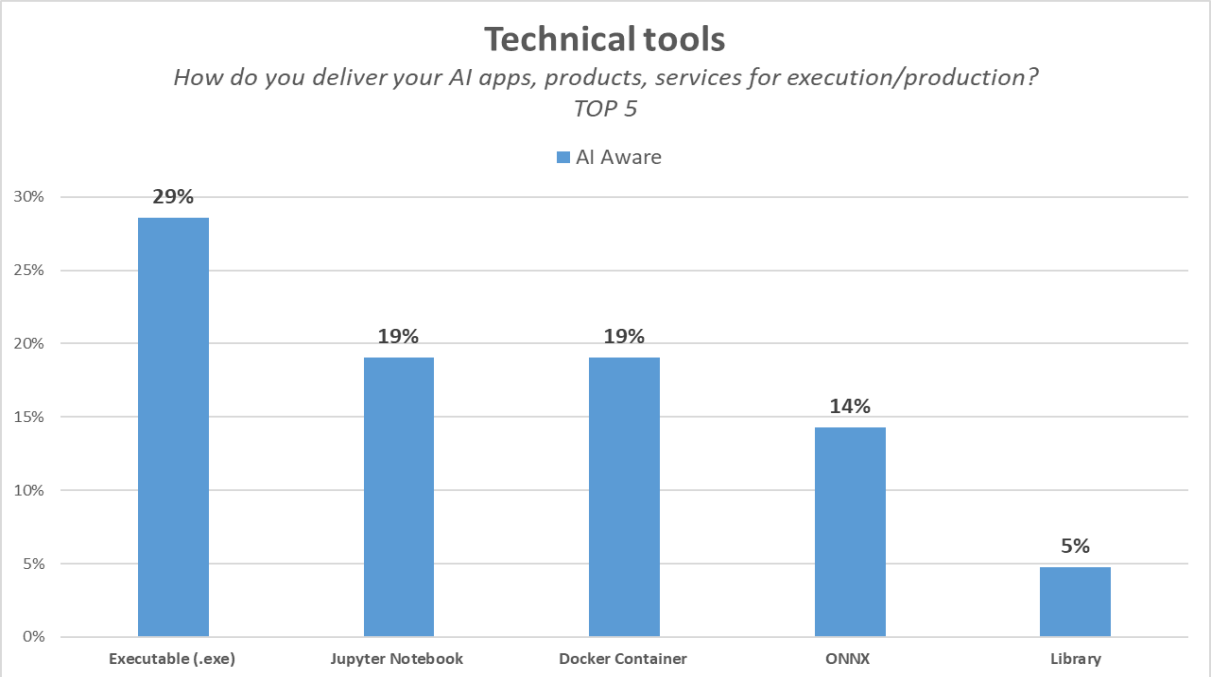
The technology mostly used for the public interface of AI applications, products or services is the graphical user interface (41%). To a lesser extent also RESTful interface (29%) and ROS (12%).



The AI algorithms mostly used are linear regression (7%), logistic regression (6%), decision trees (5%), Naïve Bayes techniques (5%) and Support Vector Machines (5%).



The most used AI algorithms are those related to image processing and text processing (38% and 31%), followed by speech and audio to a lesser extent (below 15%).



The most used format for delivering AI applications, products and services for execution/production by public sector respondents is executable (.exe) (29%), followed by Jupyter Notebook and docker container (21%), ONNX (14%) and, finally, library (5%).

10.2.2 Overview of existing literature and AI assets

During the desk research activity, overall, we have analysed 33 documents, issued in the last 3 years by academia/research institutes, think tanks, governments, and other relevant AI and policy experts. Secondly, we have investigated recent trends in AI procurement to detect interesting needs in terms of what public bodies look for in the AI market. Finally, we have revised (ongoing or completed) projects

(6 related documents) at the EU level which could be relevant in terms of potential synergies and already addressed requirements for public sector bodies. A summary of this review is provided below.

10.2.2.1 Literature

The review of recent literature highlights key common issues for the adoption of AI in the public sector. First, governments and the general public have **justified concerns over bias, privacy, accountability, transparency and overall complexity** (Farrell, E., Giubilei, M., Griciene, A., et al., 2023; World Economic Forum, 2020). There is a general **lack of experience** in acquiring modern AI solutions and overall **complexity in integrating them** into existing digital infrastructures (McBride, K., van Noordt, C., Misuraca, G., Hammerschmid, G., 2021). A recent (Farrell, E., Giubilei, M., Griciene, A., et al., 2023) survey of public sector representatives organized jointly by the JRC and DG Digit reported the following as the main challenges related to the uptake of AI: **trustworthiness, cooperation, procurement, data, skills and human resources**. These challenges are worldwide as confirmed by the study led by SAP Institute for Digital Government performed in 2020-2021on nine Australian projects (Rinta-Kahila, T., Someh, I., Gillespie, N., Indulska, M., Gregor, S., Van Leent, R., Ryan, I., 2021).

Research confirms a growing trend in the development of AI applications in the public sector, highlighting how public organizations are going fast, or even rushing in the usage of AI (Jorge Ricart, R., Van Roy, V., Tangi, L., 2022). For the public sector to continue with this positive trend, however, specific needs must be addressed. We describe them in detail in this section.

10.2.2.1.1 Main needs

The main needs of the public sector emerging from the literature were clustered according to several categories:

- AI literacy and talent
- Management support and employment involvement in AI acceptance
- AI governance
- AI risk control
- Data and infrastructure
- Procurement
- Trustworthy AI

10.2.2.1.1.1 AI literacy and talent

AI literacy refers to the basic understanding of AI, while AI talent refers to the internal capabilities of one organisation of building and maintaining AI models. The literature shows that this category is fundamental to enable AI uptake and awareness among European public administrations. However, it remains to a large extent an unaddressed issue.

Relevant pieces of literature (Schedler, Guenduez, & Frischknecht, 2019; Neumann, Guirguis, & Steiner, 2022; Farrell, E., Giubilei, M., Griciene, A., et al., 2023) show that European public administrations need substantial improvement in terms of technical or managerial skills and knowhow in the broader realm of digital literacy. The urgency of such needs is proven also by the fact that Member States have called on the Commission (European Commission, 2021) to promote the creation of an AI talent pool and facilitate the development of training opportunities in digital literacy and skills for law enforcement. Furthermore, a report published in 2023 on the current state of AI development in Europe (Sheikh, Prins, & Schrijvers, 2023) contains several recommendations for the public sector, among them to *"stimulate the development of 'AI literacy' amongst the general public, beginning with the establishment of algorithm registers".*

AI literacy is a key enabling factor for AI procurement, which more specifically concerns: (i) basic digital skills and digital literacy; (ii) AI-specific knowledge at senior management levels; and (iii) well-functioning interdisciplinary teams, particularly given the complexity of AI systems and their development. This remains valid also for AI-mature public administrations (Expert Group on Future Skills Needs, 2022).

10.2.2.1.1.2 Management support and employment involvement in AI acceptance

Management support for AI initiatives (e.g., organizational support, right allocation of resources etc.) as well employees' trust and acceptance of AI-based systems are fundamental drivers of AI adoption within an organisation. The literature shows that there is need to guide public employees toward a cultural transformation which starts from the management level. However, resistance to change and bureaucratic culture are barriers which are still present.

The literature states that, only by properly balancing automation and augmentation, organizations can virtuously introduce AI in their activities. This starts from a cultural transformation, which must be shaped in primis by senior managers (van Noordt, and Misuraca 2020a). Together with this, a proper process of education and training of employees is needed to favour AI acceptance and revise properly management practices and human tasks affected by AI adoption (Maragno & Tangi, 2022). The potential lack of AI explainability also surfaced as an obstacle to acceptance due to the public sector's need to operate in a transparent manner. Interviewees in the survey conducted by the University of Queensland SE and SAP (2021) emphasized the importance of keeping a human in the loop as the controller of AI.

Management support and employment involvement are extremely challenging, especially in the public sector, where resistance to change (Ashaye and Irani 2019) and bureaucratic culture (Meijer 2015) act as barriers, and where the cultural change driven by the introduction of digital technologies is far from being reached.

10.2.2.1.1.3 AI governance

AI governance refers to the concept of enforcing an AI governance framework, often integrated with an existing data governance framework, to manage all the different aspects across the lifecycle of an AI solution. The literature shows that public sector needs to develop a better understanding of the governance mechanisms and regulatory implications linked to AI adoption and its impact on administrations and citizens.

Enforcing AI governance frameworks has become an imperative for public sector organizations, which are faced with the pressure to deploy automated decision-making systems while protecting citizens' fundamental rights (Kuziemski & Misuraca, 2020). This means governments must first develop a better understanding of the governance mechanisms and regulatory implications that are changing the way that public and private sector organisations operate, as well as the impact they have on citizens' rights. Recently, two use cases in the public sector, the SyRi and Gladsaxe cases (Digital Future Society, 2021), respectively a Dutch welfare fraud detection system and a profiling model used in Danish municipalities, have sparked attention as examples of the negative consequences that can stem from a lack of governance of AI. They were not exceptions since lack of proper governance was highlighted in 5 out of 9 systems audited by the Netherlands Court of Audit (Netherlands Court of Audit, 2022).

The need to establish AI governance frameworks can be broken down into the following needs for the public sector: (i) consider, during AI procurement, that testing is required throughout the whole lifespan of the AI system, not only once; (ii); develop plans and capabilities, including the definition of data science skills and business functional knowledge, to enable the adoption and support of AI solutions (iii) ensure that appropriate knowledge transfer and training is provided (Office for Artificial Intelligence, 2020).

10.2.2.1.1.4 AI risk control

AI risk control refers to whether the organisation has a proper classification of the risk level of AI systems. The literature shows that the public sector is aware of the risks of AI and there is a pressing need to receive guidance on how to ensure trustworthiness of AI systems in use.

Several reports show that awareness of AI risks is present in the public sector (Medaglia, Gil-Garcia, & Pardo, 2021; Ada Lovelace Institute, 2021). This includes for example: widening societal divides, infringing citizens' privacy rights through surveillance or data collection, and clouding the accountability of public decision-makers and that such risks require thoughtful strategies and regulation in order to be avoided or mitigated (Medaglia, Gil-Garcia, & Pardo, 2021; Rogerson, Hankins, F., & Rahim, 2022;

Sheikh, Prins, & Schrijvers, 2023). The Netherlands Court of Audit (Netherlands Court of Audit, 2022) proposes to manage the main risks associated with the use AI relying on existing standards, criteria, guidelines and legislation. The five risk areas to be tackled are identified as the following: 1. governance and accountability; 2. model and data; 3. privacy; 4. IT general controls; 5. Ethics.

The best way to mitigate risks is to ensure the trustworthiness of the AI system in use. Therefore, for public sector organisations that use AI-powered solutions, there is a pressing need to implement plans, sustainable and ongoing evaluation methods, and mechanisms to feed back into the data model (Office for Artificial Intelligence, 2020).

Furthermore, the upcoming the AI Act will establish a mandatory risk tiering of all AI systems deployed in Europe and for those systems classified as high risk, a risk management process will have to be put in place.

10.2.2.1.1.5 Data and infrastructure

With regard to data, the literature underlines some priorities at the public sector level, especially in the field of data management, access to public and private data. Lack of technical infrastructure and IT infrastructure remains a remarkable challenge.

Any AI application is, by definition, only as good as the data that drives it (Medaglia, Gil-Garcia, & Pardo, 2021). From the analysis of the European public sector presented in the AI Watch Report (2021), the following needs emerge as priority: (i) strengthening data management for AI (enhancing data quality and quantity); (ii) improving access to public data and (iii) grant access to private sector data. These needs are confirmed also by the results of the analysis of several European case studies (van Noordt & Misuraca, 2020; Harrison T. M. & Luna-Reyes L. F., 2020; Jorge Ricart, R., Van Roy, V., Tangi, L., 2022).

Twenty-four European countries have already developed (or have at least committed to developing) their own national policies on standards for data. For instance, the Estonian Government has developed a national metadata standard and data quality framework, which will be implemented in a combination of guidelines and mandatory binding legislation. Finland proposed to pilot environments of an international standard that facilitate access to world class infrastructures and data resources (Jorge Ricart, R., Van Roy, V., Tangi, L., 2022). The need for interoperability has been clearly expressed by the public sector and the Living-in.EU community has already taken an important step in this direction by implementing the Minimal Interoperability Mechanisms (MIMs) [6] and the MIMs Plus. MIMs are a set of practical capabilities based on open technical specifications that allow cities and communities to replicate and scale solutions globally. MIMs can also help overcome some of the technical challenges of procurement.

Regarding infrastructure, the public sector needs are clear: (i) there is a lack of technical infrastructure and (ii) lack of IT infrastructure (Schedler, Guenduez, & Frischknecht, 2019). Several other studies have corroborated this need and found that technical infrastructure is a key challenge when implementing new technologies into the public sector (Savoldelli et al., 2014; Schwester, 2009; Wing, 2005; Zakareya & Zahir, 2005), especially in early implementation stages (Savoldelli et al., 2014). The regulatory landscape is trying to keep up with the fast-evolving technology and there are already some important policies being developed, such as the Data Act and Data Governance Act, which will have an impact on how data is handled.

10.2.2.1.1.6 Procurement

With regard to procurement, there is a clear need for extensive and comprehensive research within the domain of public administration on the subject of public procurement of AI. Civil servants need to learn new procurement practices and approaches to comply with the needs and demands for new products and technologies (for example PCP).

Public procurement requires a specific focus. It comes with a number of challenges that sets it apart from other traditional modes of procurement (World Economic Forum, 2020). Procurement is also the

[6] https://oascities.org/minimal-interoperability-mechanisms/

foundation of effective public services, and the effectiveness of a procurement largely depends on the successful engagement of potential vendors, which are especially SMEs and startups (Segun, T. & Cardwell, J., 2022).

Drafting good technical specifications for procuring AI is not an easy task and civil servants need to learn new procurement practices and approaches. Some governments and forerunners have been working on AI procurement guidelines (McBride, K., van Noordt, C., Misuraca, G., Hammerschmid, G., 2021), however an EU-wide sharing of best practices (guidelines for technical specifications and standard clauses) in the field could represent a starting point and could really help in a number of ways.

10.2.2.1.1.7 Trustworthy AI

With regard to Trustworthy AI, the public sector requires clear ethical frameworks and guidelines to ensure that AI systems are developed and deployed in a manner that aligns with the EU values and respects fundamental rights.

The European Union (EU), seeking to limit the risks associated with AI, took the position of developing a European market for trustworthy AI solutions that have an ethical purpose and technical robustness (Digital Future Society, 2021). Public sector organisations need to develop tools and mechanisms to support an effective and trustworthy implementation of AI, especially at the local level. For example, various instruments to help spur innovation and de-risk projects, such as sandboxing and piloting, the development of local digital twins, urban data platforms and dashboards, ethical frameworks for AI and data governance, and models for AI procurement and for citizen participation (Farrell, E., Giubilei, M., Griciene, A., et al., 2023).

Governing “with AI” means humans should still remain in the classical situation of using and controlling a technology that reinforces our capacity, through a process that requires human supervision (Digital Future Society, 2021). Crucially, however, this requires building the necessary skills and expertise necessary to understanding the technical aspects of AI, ethical considerations, legal frameworks, and the ability to assess and evaluate AI systems. A crucial consideration with building AI systems relates to human decision-makers’ ability to understand and explain how these systems generate their decisions (Rinta-Kahila, 2021).

10.2.2.2 Mapping of AI solutions procured by the public sector

After having presented a wide overview of the main public sector needs, our focus narrows down to the state of the art of AI adoption. We conducted desk research to detect main trends of what the public sector is looking for in the market in terms of AI solutions. In particular, we revised the **AI Watch Dataset** (2021) considering only the cases pertinent to the public sector, **the TED Europe online dataset**[7] (from 01/2021 to 11/2022) and integrated them with **solutions collected through consultation activities** (survey, interviews and focus groups). A total of 623 relevant AI Tools were identified. Most of them come from the AI Watch database (91.8%).

The largest share of procured AI solutions comes from the “General public services” domain (as per the COFOG taxonomy[8]). This category, together with the “Economic affairs” and “Health” domain, cover the 60% of AI procurement in the period considered.

[7] A keyword search was conducted on the following terms: “artificial intelligence”, “computer-enhanced learning”, “computer-enhanced reasoning”, “computer-enhanced perception”, “machine learning”, “deep learning”. The search was limited to tenders (i) in English language, (ii) within COFOG domains and labelled as (iii) “supplies” or “combined”. All types of notices were included. A total 190 notices were manually reviewed to avoid duplicates

[8] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Government_expenditure_by_function_%E2%80%93_COFOG

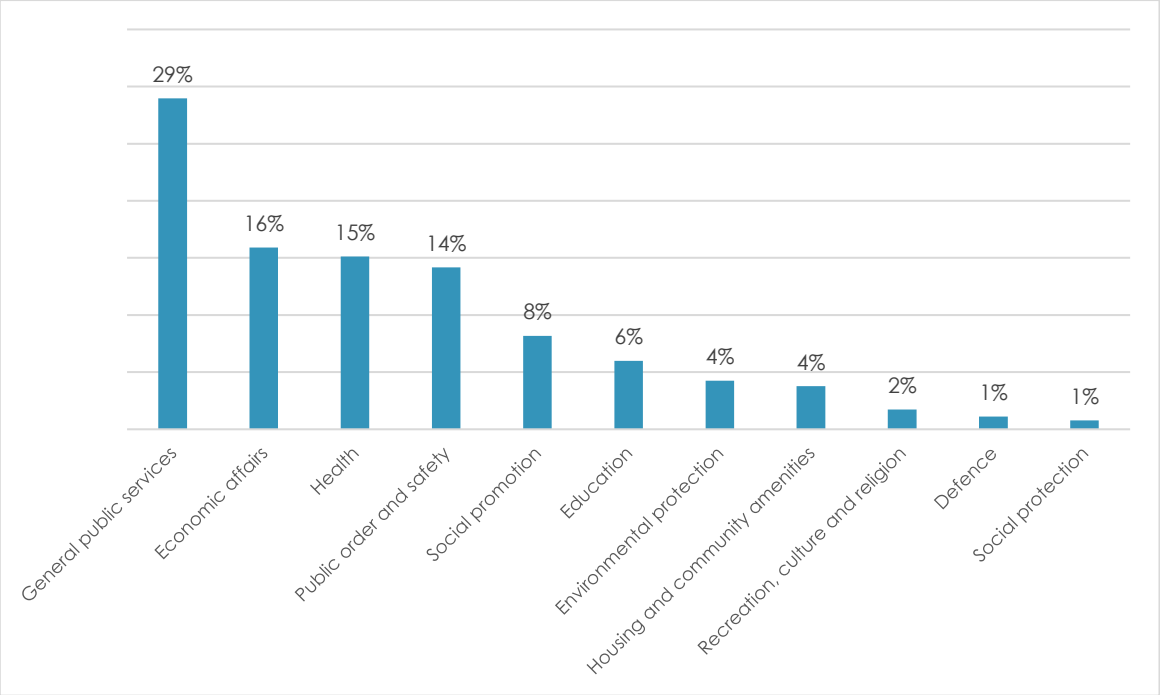


Figure 8 - AI solutions procured, by domain of public sector

Leading countries in terms of number of AI solutions procured are the Netherlands, Portugal, Italy, Estonia and France. Summed up together, they cover 50% of AI solutions procured in the period considered.

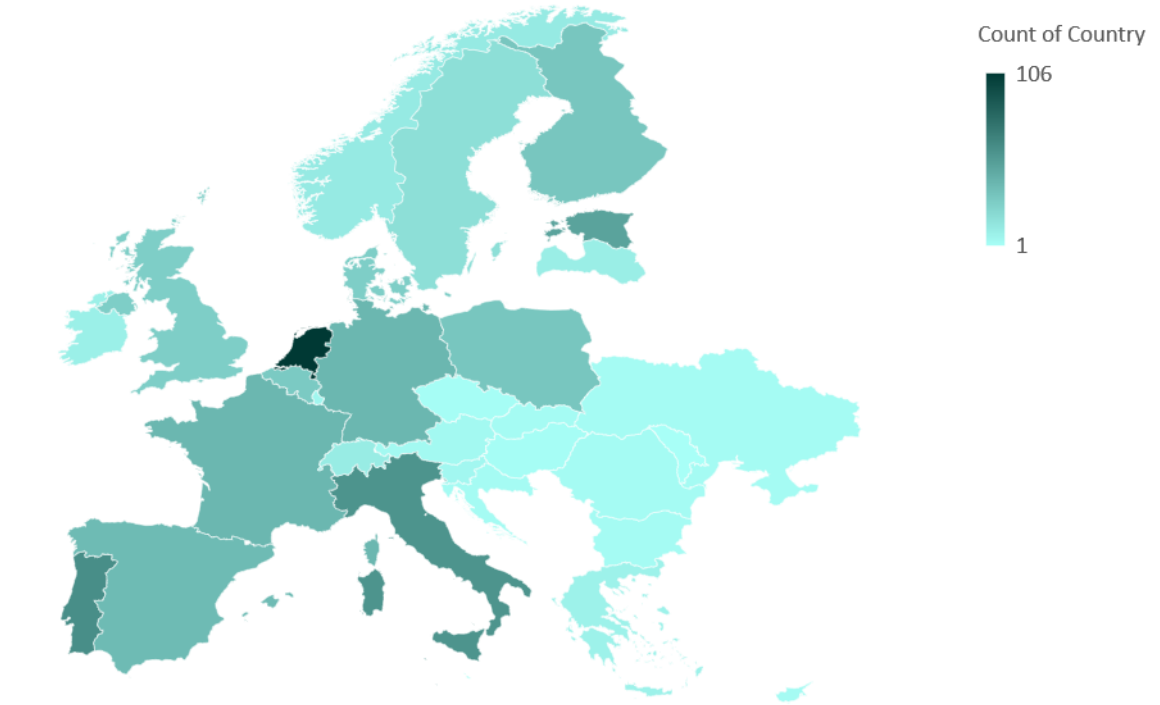


Figure 9. AI solutions procured, by country

Moreover, the largest part of AI solutions is purchased where the procurement scale is bigger, i.e.. at the national level. However, a remarkable 32% of purchases happened at the local level.

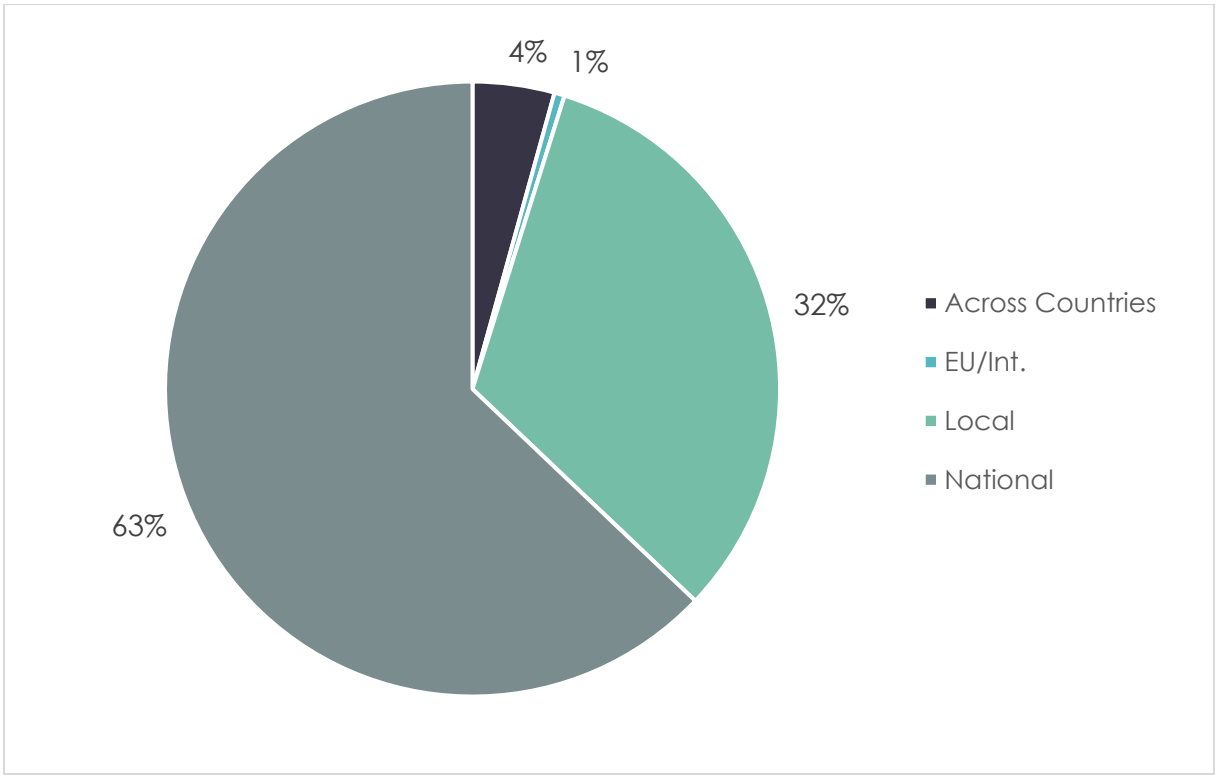


Figure 10. AI tools procured, by government level

With regard to type of AI solutions purchased, **"machine learning and deep learning solutions"** are, as expected, the most requested, followed by (i) **"computer vision and identity recognition"** – which includes applications that use some form of image, video or facial recognition to gain information on the external environment and/or the identity of specific persons or objects – (ii) "**expert and Rule-based Systems, Algorithmic Decision Making" –** which includes AI applications oriented to facilitate or fully automate decision making processes of potential relevance for the public sector – and (iii) "**natural Language Processing, Text Mining and Speech Analytics"** – which includes AI solutions capable of digitalizing and analysing speech, written text and communicate back.

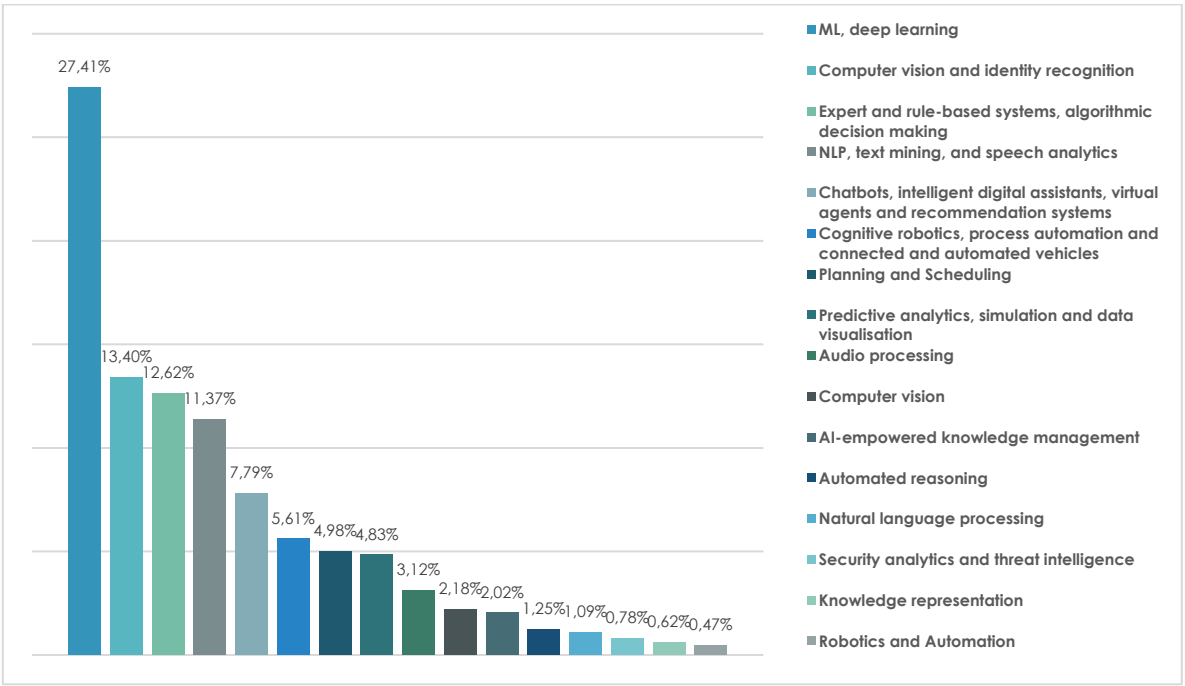


Figure 11. AI solutions procured, by type of use case

10.2.2.3 Synergies and analysis of relevant projects

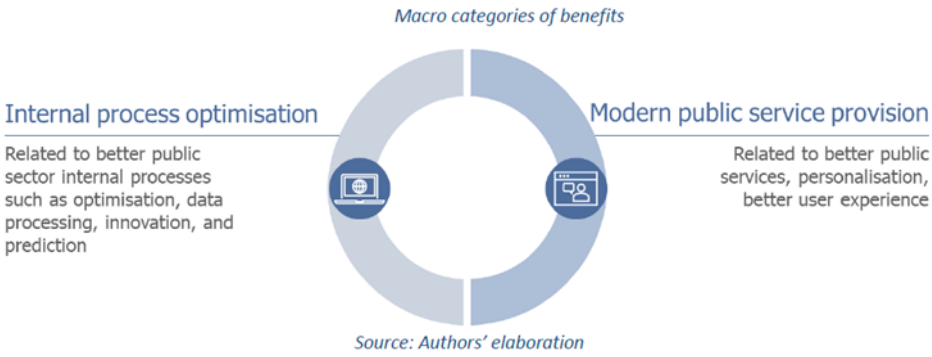
Needs and trends detected in the previous sections should be read considering ongoing projects which are already being conducted at the European level to tackle relevant issues. The development of the AI-on-Demand platform should consider what is already available in terms of practical support to the public sector, to avoid overlaps and efforts duplication.

Accordingly, this section contains a detailed summary of six relevant European projects. We analyzed the current state of the art or published reports, when available. First and foremost, we considered the Study supporting the Adopt AI program (as the programme itself has not been launched yet), as per call's requirements, but also the DT4Regions project, the Public Buyers Community, the GovTech Connect and the AI4GOV projects. With each of these projects we established synergies to various degrees, including review of relevant project materials, and, with AI4GOV Master's students, a joint Project Work.

We describe each project in the following tables. At the end of this section a summary table provides an overview of which, and to what extent, public sector requirements could be addressed leveraging on existing projects.

10.2.2.3.1 Study for the Adopt AI Programme

Date of the review	May 2023
Name of the project or initiative reviewed	Study for the Adopt AI Programme
Project Owner	European Commission – DG CNECT
Link to the project or any useful documents	Not available yet
Main functionalities delivered by the project / Main points covered in relation to public bodies	
The EU Adopt AI programme is currently under development, and it will be aimed at financing the adoption/procurement of Artificial Intelligence solutions/technologies by the public sector. The study aims to support the European Commission (DG CONNECT) in developing the content of the Adopt AI programme and in setting-up the programme. It has been commissioned by DG CNECT to learn how best to support public procurement of AI systems in the European Union and help to transform public procurement processes themselves, in the context of the ongoing work on the Adopt AI programme under development. The main purpose and objective of the commissioned study are to support the European Commission with evidence and operational recommendations on how public procurement of AI systems can be facilitated. The study provides the following set of recommendations: • Increase funding and resources for AI in the public sector • Reduce bias within AI and data sources • Encourage coordination of AI procurement strategies • Increase clarity and harmonization around cross-border data flows • Promote alignment between industry and public sector expectations • Establish a clear AI regulatory framework • Promote the integration of new AI technologies and services into existing systems in education, health and transport • Promote interoperability • Build trust in AI solutions through transparency and accountability • Focus on long-term implementation in the use of AI in the public sector • Create a European marketplace for GovTech solutions in support of public sector digital transformation • Promote the development of sustainable AI	

Review summary note	
The study identifies the state of play on the uptake and public procurement of AI technologies by the public sector in the EU and to select four priority key sectors that are ready for large-scale deployment of AI technologies. It also identifies the main challenges and benefits faced by Member States' governments when considering the public procurement of AI technologies. The macro-categories of challenges are the following: **procurement process** (burdensome administrative requirements, lack of clarity from the public sector regarding their needs/demands, complexity of writing technical specifications), **data** (unsatisfactory sharing of data across organisational boundaries, insufficient access to large volumes of high-quality data), **AI technology** (lack of transparency in AI systems' decision support/making processes) and **organisational** (lack of human resources for managing the system, lack of political support, lack of understanding of the capabilities/benefits of AI solutions, lack of human resources for procuring the system). The comparative analysis showed that challenges are not significantly different across the sectors. Governments aim to use AI to provide better public services to citizens. This in turn can translate into virtuous spillovers across different public sectors, such as higher transportation safety, more varied cultural services, and improved healthcare services, among others. The adoption of AI technologies may also support governments' internal processes, by digitalising and modernising public administrations. This may take the form of a document, audio, and speech analysis which speeds up proceedings and provide more time for the provision of other services. These two main axes are depicted in figure below:  *Source: Authors' elaboration* The study also includes an analysis of the economic potential of further investments in AI based on existing quantitative data on public procurement, market trends and maturity of AI technologies. Finally, the selection of the four key sectors (Health, Mobility, E-Government and Education) that are most ready for large-scale deployment of AI technologies is provided in the final section. Leading the way in terms of AI maturity, these central sectors are already undergoing significant change, however AI has not yet left a distinguishable mark and in all 4 sectors, the utility of AI applications for increasing efficiency is well-established. These applications address simpler administrative and "back-office" tasks as they are relatively undisruptive, uncontroversial and cheaper than other solutions.	
Activities conducted in the context of the synergy	**Future synergies to leverage for the development of the AIoD platform**
• Review of the final study report	The AIoD platform will take into account the results of the study of the Adopt AI programme as well as follow the evolution of the set-up of the Adopt AI Programme itself.

10.2.2.3.2 Digital Transformation for Regions (DT4REGIONS)

Date of the review	February 2023
Name of the project or initiative reviewed	Digital Transformation for Regions (DT4REGIONS)
Project Owner	Emilia-Romagna Region
Link to the project or any useful documents	https://dt4regions.eu/
Main functionalities delivered by the project / Main points covered in relation to public bodies	
The platform established within the project is meant to address a set of needs, which are considered particularly relevant for public sector bodies at the regional level. For example, the platform includes a collection of “digital transformation stories” and “solutions”. For each of these needs, specific actions are undertaken within the project, as summarised in the following table: The platform design has been completed and the deployment is proceeding towards the completion of the above-listed actions.	
Review summary note	
DT4REGIONS is a European Parliament Preparatory Action supported with European Funds. It aims at (i) the creation of a European platform for Regions to enable AI and Big Data collective solutions and (ii) the strengthening of public administration efficiency and effectiveness in user-centric services. The Consortium is made of The DT4REGIONS project is made up of eight Regional Entities and three private companies, including a research entity, one technology centre and two non-profit associations. The type of platform which is being developed should be considered at the intersection of three platform typologies: “Forum and collaboration” aimed at offering opportunities for participation and discussion between final users. “Capacity building” aimed at providing real opportunities for capacity building by offering free training, webinars and resources “Challenge-based” aimed at pooling solutions provided by private or other public actors for challenges previously identified by platform participants.	
Activities conducted in the context of the synergy	**Future synergies to leverage for the development of the AIoD platform**
• Dissemination of the survey to their network • One one-to-one interview • One Focus Group with the Regions partners of the project • Analysis of the DT4Regions platform • Review of the four project deliverables	The main objective of the DT4Regions platform is to collect and show Digital Transformation stories and solutions. The platform also offers training on topics such as digital technology in general, AI, legislation on digital technologies, philosophy of AI, data and others, in the form of webinar or reading content. Moreover, there is also a section dedicated to events. The project could therefore offer significant support to the AIoD platform for the following functionalities: content, training and events. Another functionality the project can offer support for, however limited, is “contacts”. On the DT4Regions platform there is a section dedicated to the “community” where users can

	find contacts of stakeholders involved in the projects and the AI community.

10.2.2.3.3 Public Buyers Community

Date of the review	March 2023 (updated in May 2023, as the website was made public)
Name of the project or initiative reviewed	Public Buyers Community
Project Owner	European Commission – DG GROW
Link to the project or any useful documents	https://public-buyers-community.ec.europa.eu/communities
Main functionalities delivered by the project / Main points covered in relation to public bodies	
The initiative aims at connecting all the public buyers with the Commission and other relevant stakeholders, by pooling initiatives and best practices on public procurement as well as developing joint actions and shared (market) intelligence. The initiative is based on a platform-based community of practice. This platform is based on nine different communities (digital spaces) which could be accessed by all public buyers based on their profile and area of interests. Accordingly, the following functionalities can be addressed: • Access to a network of Central Purchasing Bodies (CPB) • Support in procuring AI-enabled solutions that are trustworthy, fair and secure • Access to a Network of Competences Centres • Contact private ICT procurers • Access to a Network of public procurement review bodies in south-eastern Europe (Albania, Bosnia and Herzegovina, Croatia, Kosovo, North Macedonia, Montenegro, Slovenia, Rumania) • Access to the Alumni network of the Public Procurement Excellence Programme (PPE) • Access to a community of Public Buyers interested in Sustainable Solar PV	
Review summary note	
With this community of practices, DG GROW is seeking to establish a digital platform to pool needs and solutions for public buyers. The platform is still being developed. The current version already presents a list of useful functionalities which will be included, especially addressing the following topics: • Specialised support in undertaking procurement initiatives • Networking initiatives among public buyers • Thematic support and peer-learning (e.g., in the field of sustainability, ICT, AI procurement) Furthermore, subscribers to the platform can access news, events, reports and projects shared by other public buyers and the Commission with the aim of continuously disseminating relevant information.	
Activities conducted in the context of the synergy	**Future synergies to leverage for the development of the AIoD platform**
• Dissemination of the survey	The Public Buyers Community taps into the public sector need of support regarding

• One interview with the Project Officer • Analysis of the platform	procurement of AI both in terms of guidelines and access to buyers. The AIoD platform could serve as a link to this community without replicating their contents and it would be interesting for Public Buyers to connect with the community of stakeholders on the AIoD platform. This community of practices offers specialized support in undertaking procurement initiatives (the platform has a specific community "Procurement of AI" dedicated to supporting public buyers in procuring AI-enabled solutions that are trustworthy, fair and secure), networking initiatives among public buyers, thematic support and peer-learning (e.g., in the field of sustainability, ICT, AI procurement). Furthermore, subscribers to the platform can access news, events, reports and projects shared by other public buyers and the Commission with the aim of continuously disseminating relevant information. Moreover, MIM 5 will provide the technical capabilities required to check that the algorithmic systems offered by suppliers comply with the requirements for fairness, trustworthiness and transparency identified by Amsterdam and by other checklists and standards. It can therefore offer support for the following functionalities: events, contacts, data, training, procurement support and guidelines, contacts and events.

10.2.2.3.4 Fostering digitization of public sector and green transition in Europe (Govtech connect)

Date of the review	March 2023
Name of the project or initiative reviewed	Fostering digitisation of public sector and green transition in Europe through the use of an innovative European GovTech platform – Pilot Project
Project Owner	European Commission – DG CNECT
Link to the project or any useful documents	https://joinup.ec.europa.eu/collection/govtechconnect
Main functionalities delivered by the project / Main points covered in relation to public bodies	
This pilot project aims to establish an online platform to bridge public sector bodies and key startups in the GovTech field. The aim is to create a space where public bodies and startups can share their knowledge and experience. The project will also organise four bootcamps for SMEs and startups which have different regional and thematic focus (Sustainability, Public Sector Digitisation, Health-Tech and Smart Cities). This space has been recently opened on the *Joinup* platform where material, experiences, documents, events addressed to start up, SMEs, industry, GovTech lab, policymakers, incubators and Venture Capitalists are shared. In particular, the following useful functionalities are (or will be) provided: • Strategic analysis of GovTech market trends in Europe	

• Information on European GovTech initiatives • Trainings on design thinking methodology and citizen engagement for GovTech solutions development • Invitation to webinars, workshops and other events to promote networking and knowledge sharing.
Review summary note
The Consortium aims at supporting public bodies across the EU in the adoption of innovative technologies developed primarily by SMEs and startups, but also be developed by larger businesses, academia, the third sector and internal public sector teams. By developing and fostering the European GovTech ecosystem by building a community also supported by the Joinup online platform. The community will involve all the different relevant stakeholders to foster the GovTech market in the EU. The project includes several activities, among them: a foresight study; a design thinking reusable training based on a design thinking methodology for GovTech labs within the public sector, European Digital Innovation Hubs and startups; organization of events, and synergies with other EU initiatives. A key activity to bring the Public sector closer to innovative solutions developed by startup is the organization of four European bootcamps for Govtech startup acceleration.

Activities conducted in the context of the synergy	**Future synergies to leverage for the development of the AIoD platform**
• Dissemination of the survey on the project's Joinup page • Analysis of the Joinup page	The Govtech Connect project has a dedicated page on Joinup where users can find a calendar with European events dedicated to the following topics: public sector digital transformation, health-tech, smart cities, sustainability and AI. These events and news are also shown on the homepage. The Joinup page is useful also to get access to contacts of key stakeholders belonging to the govtech/AI European community. It is envisaged that there will be also some AI-specific content in the form of use cases or interviews with experts. Finally, during the bootcamps the AI related startups will test the reusable toolkit for citizen engagement and design thinking to improve their products in a user centric approach and make them fit for the PS.

10.2.2.3.5 Artificial Intelligence for Public Services – AI4Gov project

Date of the review	February 2023
Name of the project or initiative reviewed	Artificial Intelligence for Public Services – AI4Gov project
Project Owner	Connecting Europe Facility (CEF) Telecom programme
Link to the project or any useful documents	https://www.ai4gov-hub.eu/
Main functionalities delivered by the project / Main points covered in relation to public bodies	

The project has been delivering for three years a Master's Program open to researchers, public administrators and corporate partners from all over the world.
Therefore, key functionalities provided to public administrations include a 1-year training (60 CFU) to allow students acquiring the following skills:

- Understand datasets (quality, appropriateness, value, cost, etc.)
- Operate with data and to manipulate data to extract insights for design
- Understand the state-of-the-art of AI and the available market solutions with a level deep enough to commission implementation
- Strategic management abilities for AI-based projects
- Apply a human-centric approach to the design of AI-based services
- Manage innovative procurement and public-private partnership in public services design and delivery
- Evaluate the quality of the commissioned implementations
- Create public value through innovative design and implement AI-based projects

Review summary note

AI4Gov is a leading international ecosystem of research, training, and innovation opportunities aiming to improve the use of AI in public services. It is based on two key pillars:

- **A Master's Program** – Trainings offered by four European universities to functional specialists in AI (researchers, public administrators, corporate partners). The overall expected outcome culminates in the education of functional specialists in the application of AI to public services. A functional specialist in AI and public services will not only understand the foundations and state of the art of AI technologies, but also the full cycle for the development and delivery of public services that make use of AI technologies, including design, development, delivery and evaluation.
- **A Knowledge Hub** – Contact and contents sharing mechanism among professionals, researchers, companies, governments and innovators, focused on: (i) new technologies such as AI and data management, (ii) governance and sharing practices.

The project also aims at building a community of relevant stakeholders belonging to the AI for public services ecosystem.

Activities conducted in the context of the synergy	**Future synergies to leverage for the development of the AIoD platform**
• Dissemination of the survey • Conducted a Project Work with the Master's students (see details of the activities in Annex II). • Connection with the stakeholders' community developed by the project to also raise awareness around the further development of the AIoD platform	The one-year Master's Program is designed to provide training on how to design, implement and govern AI projects in the public sector, including insights on how to draft good technical specifications for procuring AI. This Master's program could also offer support through a contact and content sharing mechanism among professionals, researchers, companies, governments and innovators in the AI field. The Knowledge Hub can provide valuable content that can be uploaded on the AIoD platform and the community they are building can provide several key contacts.

10.2.2.3.6 Tech4Gov Watch

Date of the review	June 2023
Name of the project or initiative reviewed	Tech4Gov Watch
Project Owner	European Commission DG DIGIT and JRC
Link to the project or any useful documents	Not available yet
Main functionalities delivered by the project / Main points covered in relation to public bodies	
In the Joinup platform of the European Commission, the Tech4Gov Watch will be hosted. It represents a knowledge observatory collecting and describing innovative use cases of emerging technologies adoption in public services. Accordingly, the observatory can provide relevant contents and contact information on recently implemented AI tool or services by European public administration, following the legacy of the AI Watch. The cases will also be analysed and presented in public events in the course of 2024.	
Review summary note	
It is expected that by the end of 2024, the Tech4Gov watch will be completed with up to 400 AI cases which will be published online. Moreover, the observatory will also showcase success stories explaining in details cases of particular relevance.	
Activities conducted in the context of the synergy	**Future synergies to leverage for the development of the AIoD platform**
The project has just started, so no specific activities were devoted to the AIoD platform. However, these may be envisaged in the future.	The AIoD can leverage on the cases collected and analyzed within the observatory to showcase and disseminate main AI adoption trends in the public sector.

Project title	Main functionalities delivered by the project/initiative										Procurement		Details on potential synergies
	Content	Contacts	Technical tools	Data	Training	Services	Funding	Jobs	Events	Support	Support	Guidelines	
Adopt AI												✓✓✓	The Adopt AI support study collected the needs of the public sector, especially concerning the identified "focus areas". However, the Adopt AI Programme has not been launched yet.
DT4REGIONS	✓ ✓ ✓	✓			✓✓				✓ ✓				• Content: Digital Transformations stories from several European regions • Training: training modules on topics such as AI, data, guidelines for digital transformation etc., both in the form of webinars and written content • Events: the platform offers visibility for events related to AI and digitalisation at the European level • Contacts of stakeholders belonging to the European AI community, both from the public and the private sector
Public Buyers Community	✓	✓✓		✓ ✓	✓✓				✓		✓✓✓	✓✓✓	• Contacts of stakeholders belonging to the European AI community, including ICT providers. The community is a space for European public procurers and the European Commission to meet and work together • Training: training modules in the form of webinars • Data: the platform provides access to catalogues of data, solutions and specific services • Support and guidelines for procurement: the platform has a specific community ("Procurement of AI") dedicated to supporting public buyers in procuring AI-enabled solutions that are trustworthy, fair and secure. • Content: subscribers to the platform can access news, events, reports and projects shared by other public buyers and the Commission • Events: visibility for European events related to AI, digitalisation of the public sector etc.
GovTech Connect	✓ ✓	✓✓							✓ ✓				• Content: use cases on AI • Contacts of stakeholders of the GovTech community, including civil servants, SMEs, startups • Events: webinars, workshops and other events to promote networking and knowledge sharing

Project title	Main functionalities delivered by the project/initiative										Procurement		Details on potential synergies
	Content	Contacts	Technical tools	Data	Training	Services	Funding	Jobs	Events	Support	Support	Guidelines	
AI4GOV Project	✓	✓			✓✓ ✓							✓✓	• Training in the form of a 12 months-Master's course, which includes procurement guidelines • Content: success and failure stories of AI implemented in the public sector, guidelines • Contacts: the Master's course creates a community of relevant stakeholders from the public and private sector, all working for the digitalisation of the public sector
Tech4Gov Watch	✓ ✓	✓							✓				• Content: updated mapping of cases of AI adoption in public administrations and success stories • Contacts and events: relevant events linked to the observatory contents and related analysis could be promoted and showcased.

Legend: relevance of the category for future synergies with the AIoD platform, ranging from 1✓ to 3✓ where 1 means least relevant

10.2.3 Focus Groups Reports

We conducted three focus groups with (i) national, (ii) regional and (iii) local public administrations. In addition, we conducted one focus group with EDIHs focused on the public sector. Evidence gathered in these consultation exercises fed into the analysis reported in the sections above. In this annex, we report in-depth reports of each focus group.

10.2.3.1 National focus group

10.2.3.1.1 Introduction

This document outlines the outcomes of the Pre-PAI focus group held with several representatives of European ministries.

10.2.3.1.2 Purpose of the meeting

This focus group is set to dig deeper into main needs of national public administrations with regard to the adoption and use of AI. In particular, the discussion will be based on all the functionalities and use of Generative AI which, if developed on the AI-on-Demand platform, would provide value to public officers dealing with, or interested in, the use of AI for public services. The meeting was conducted online and lasted around 90 minutes.

10.2.3.1.3 Participants

Ministry	Role of the participant
Slovenian Ministry of Foreign Affairs	Policy and Programme officer
Ministry of Research, Innovation and Digital Policy of Cyprus	Administrative Officer
Agency for Statistics of Bosnia and Herzegovina	Head of Department for Industry and Construction Statistics
Swedish Agency for Digital Government	Trend Analyst
Portuguese Ministry of Justice	Govtech advisor
Spanish Ministry of Health	Area Manager

10.2.3.1.4 Activity 1. Share your experiences with AI

Question	Response Each bullet point represents one response
• Have you procured any AI tool or solution in the last two years? If yes, what have you procured?	• Most of respondents cite to have not yet procured any AI related solution
• Which main challenges have you faced in the procurement of AI?	• Challenges with Cloud services with US Services, especially concerning AI driven solutions for monitoring articles, etc.
• Which main challenges have you face in the use of AI?	• Have not yet faced any challenges, because the AI tools we used were mainly commercial ones • Data protection related issues • Data stored in silos and the legal prohibition of data sharing among Agencies • Prohibition of use of US tools
• Do you think that similar administrations in your country face similar challenges?	• Yes, but only large agencies can afford to work with AI, but good solutions are not scaled

10.2.3.1.5 Activity 2. Rank the AIoD platform functionalities

During the focus group activity, the participants were asked to rate the following questions, divided into segments. The ranking options we from 5 to 1, with 5 being “highest priority” and 1 being “lowest priority”. The participants were invited to participate voluntarily, and the responses were anonymous.

Functionality: Content	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have access to success stories on AI projects?	4-4-3-3
Have access to best practices and guidelines documents?	4-4-3-5
Have access to selection of articles on AI in the press?	2-2-2
Have access to a selection of papers on AI applications?	3-2
Have access to a selection of academic research papers	4-2-4
Functionality: Contacts	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
have access to AI solutions providers fitted to your needs, by category?	2-2-2-5
Have access to Venture Capitalists	1-1-2-1
Be introduced to AI solutions providers	2-5-5-5
Be introduced to like-minded companies	5-4
Have access to a TEF/DIH?	4-4
Functionality: Services offered by providers	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have easy access to coaching services?	2-3-5
Benefit from basic and or training service?	3-5
Have access to support in assisting with data acquisition, data processing and data analysis?	4-4-5
Have access to guidelines or checklists to assess and document the trustworthiness of your IA solution?	5-4-5
Have services that help you to assess the quality of the AI?	5-4-5
Benefit from legal services to address the trustworthiness of AI application, including AI regulation (AI Act)?	5-5
Benefit from ethical services to address the trustworthiness of AI applications?	4-5
Functionality: Funding programs	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have access to a map of funding services?	4-4-5
Be informed of project proposals?	4-4
Be informed of AI challenges?	4-4
Be informed of current and future public funding or cascade funding opportunities?	4-4
Functionality: Data	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have access to existing data bases?	3-5-5
Know about existing initiatives for data sharing?	1-4-4-3
Have methods to assess the quality of your data?	5-5-5
Know about existing data spaces in your domain?	5-5
Functionality: Jobs	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Be informed of open job offers in the field of AI?	2-3
Post jobs offers in the field of AI?	3-3
Functionality: Training	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:

Have autonomous access to basic training modules on AI?	2-5-5
Have autonomous access to basic training modules on application of AI to your domain?	2-5-5
Have autonomous access to advanced training modules on AI?	4-5-5
Have autonomous access to training on Trustworthy AI, including regulation?	5-5-5
Have autonomous access to a catalogue of best practice for learning AI skills?	4-4-5
Functionality: Events	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Be informed of research events in the field of AI?	3-3-3
Be informed of professionals' fairs in the field of AI?	2-3
Be informed of EC organized events in the field of AI?	3-3
Be informed of related initiatives in the field of AI?	3-3-4
Be informed of regulation updates in the field of AI?	3-5-5
Functionality: Technical tools	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Be able to search contents through a search engine (by categories, authors, filters…)?	5-5

10.2.3.1.6 Generative AI

Question	Answer	Frequency
Did you try to use Generative AI in the context of your work?	Yes	4
	No	5
Which Systems did you use?	Chat GPT	3
	Llama (Meta AI)	1
	Alpha Code	1
What are the risks you identified using Generative AI?	Confidentiality Concerns	2
	GDPR Concerns	3
	Intellectual property	2
	Potential plagiarism	2
	Sovereign concerns	2
	Ethical considerations	3
	Needs to hire/train people with specific domain skills	1
	Needs to train current employees on Generative AI	2
	Lack of data related to my own business	1
	Control loss over my data	1

10.2.3.1.7 Open comments

Would like to know how to procure or embed AI technologies and eliminate bias issues	We are expecting a serious lack of legal expertise following the passing of AI-Act as the few experts we have in the public sector may be poached by the more lucrative private sector
Would like to know how to avoid bias issues when using Generative AI	Search functionality is necessary, but the platform should also provide the option to match your needs to available resources

We would like the platform to also assist with peer-to-peer contacts for EU AI Regulatory Sandboxes	We are painfully aware of how unaware public and private bodies are of European resources and platform - how can this improve?

10.2.3.1.8 Overall findings

Amidst the requirements discussed, the ones that stand out according to the National representatives' responses are **services** offered by providers**, training,** and **data**. They express the need to have methods to assess the **quality of the data** as well as of the AI models and have **autonomous access to training** on Trustworthy AI, including regulation. Participants also cited, not only during the activity n.2, but also during the general group discussion, that a relevant support would be **having access to funding programs** as well as getting support on filling the applications those applications, by experts.

The main challenges the participants cite concern ensuring the quality of the data and data sharing among agencies. The sharing of data and of use cases would serve as an example of best practices and be useful to improve the way of dealing with data collection and large databases.

The results of the third activity points to a low usage of Generative AI in participants' work environments. The most frequent use cases of Generative AI concern chatbots, specifically ChatGPT, Llama and Alpha code. At the same time, participants identified the risks of the use of Generative AI, among which the most frequently mentioned were GDPR concerns and Ethical considerations. It is important to note, even if not as highly ranked as the previous, respondents have also identified concerns about confidentiality, intellectual property, sovereignty and the need to train current employees on Generative AI.

10.2.3.2 Regional focus group

10.2.3.2.1 Introduction

This document outlines the outcomes of the Pre-PAI focus group held with several representatives of European regions and regional communities.

10.2.3.2.2 Purpose of the meeting

This focus group is set to dig deeper into main needs of regional public administrations with regard to the adoption and use of AI. In particular, the discussion will be based on all the functionalities which, if developed on the AI-on-Demand platform, would provide value to public officers dealing with, or interested in, the use of AI for public services. The meeting was conducted online and lasted around 90 minutes.

10.2.3.2.3 Participants

Region	Role of the participant
Emilia- Romagna	Responsible for digital transformation, Direzione Generale Risorse
Nouvelle Aquitaine	European affairs mission charge
Basque Country (JIE)	Technical Advisor Board Manager
Catalunya	Head of the Digital Services Improvement Impulse Area
Helsinki-Uusimaa	Senior Advisor at Helsinki-Uusimaa Regional Council
Flanders	Policy Officer for Digital Strategy
South Moravia (JIC)	Project Coordinator
Baden-Württemberg (bwcon)	EU Project Coordinator
ERRIN	Project and Policy Manager
Boundaryless	Co-founder and platform designer

10.2.3.2.4 Activity 1. Share your experiences with AI

Question	Response Each bullet point represents one response
• Have you procured any AI tool or solution in the last two years? If yes, what have you procured?	• NLP technologies. • Services like **translation, speech2text, text2speech, anonymization.** • **Fraud detection** software • **Chatbot,** platform to exchange open data between regional stakeholders. • **Computer vision** for traffic control
• Which main challenges have you faced in the procurement of AI?	• **Integrate "green" principles into AI**. It's a priority to integrate these 2. • It is a challenge **to identify cognitive biases** on **cyber frauds/attacks.** • The market offers lots of choices, **it isn't easy to figure out which the best provider** or solution is.
• Which main challenges have you face in the use of AI?	• **Failed to anticipate bias in the fraud detection process.** • The lack of parameters to measure the quality of the AI solution.
• Do you think that similar administrations in your country face similar challenges?	• Challenges shared among administrations in the same country are the lack of communication and sharing of AI best uses and practices.

10.2.3.2.5 Activity 2. Rank the AIoD platform functionalities

During the focus group activity, the participants were asked to rate the following questions, divided into segments. The ranking options we from 5 to 1, with 5 being "highest priority" and 1 being "lowest priority". The participants were invited to participate voluntarily, and the responses were anonymous.

Functionality: Content	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
have easy access to coaching services?	5-5-4-3
benefit from basic and/or advanced training services?	5-5-4-3
have access to support in assisting with data acquisition, data processing, and data analysis?	4-3-3
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	4-4
have services that help you to assess the quality of the AI model?	5-5-4
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	5-5-5
benefit from ethical services to address the trustworthiness of AI applications?	4-3-5
Functionality: Contacts	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
have access to AI solutions providers fitted to your needs, by category?	5-5-5-5
Have access to Venture Capitalists	2-2-2-2
Be introduced to AI solutions providers	4-3-3-3
Be introduced to like-minded companies	4-4-3
Have access to a TEF/DIH?	5-5-4-4-3
Functionality: Services offered by providers	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:

Have easy access to coaching services?	5-5-4-3
Benefit from basic and or training service?	5-5-4-3
Have access to support in assisting with data acquisition, data processing and data analysis?	4-3-3
Have access to guidelines or checklists to assess and document the trustworthiness of your IA solution?	4-4
Have services that help you to assess the quality of the AI?	5-5-4
Benefit from legal services to address the trustworthiness of AI application, including AI regulation (AI Act)?	5-5-5
Benefit from ethical services to address the trustworthiness of AI applications?	5-4-3
Functionality: Funding programs	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have access to a map of funding services?	5-3-3
Be informed of project proposals?	4-4-4
Be informed of AI challenges?	5-4-4
Be informed of current and future public funding or cascade funding opportunities?	5-5-4-4
Functionality: Data	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have access to existing data bases?	5-5
Know about existing initiatives for data sharing?	5-4
Have methods to assess the quality of your data?	5-5-4
Know about existing data spaces in your domain?	5-5-4
Functionality: Jobs	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Be informed of open job offers in the field of AI?	2-2-2
Post jobs offers in the field of AI?	3-2-2
Functionality: Training	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Have autonomous access to basic training modules on AI?	5-5-4-3
Have autonomous access to basic training modules on application of AI to your domain?	5-5-4-3
Have autonomous access to advanced training modules on AI?	5-4-3-3
Have autonomous access to training on Trustworthy AI, including regulation?	3-3
Have autonomous access to a catalogue of best practice for learning AI skills?	5-5-4
Functionality: Events	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Be informed of research events in the field of AI?	4-3-2
Be informed of professionals' fairs in the field of AI?	3-3
Be informed of EC organized events in the field of AI?	4-4-3
Be informed of related initiatives in the field of AI?	4-3
Be informed of regulation updates in the field of AI?	5-5-4
Functionality: Technical tools	
To what extent, the following functionalities could be beneficial for Public Administration:	Ranked replies provided:
Be able to search contents through a search engine (by categories, authors, filters…)?	5-4-4

10.2.3.2.6 Open comments section

• I would like to have artifacts that could be downloaded anyway instead of a service approach.	• Would also be interested to address the question of training for elected politicians/policy makers
• Would also be interested to address the question of training for elected politicians/policy makers	• We were talking about the attractiveness of the public sector for technical profiles. Maybe it could be interesting for you as an organisation to investigate how we can make it more interesting for such profiles?
• What about a framework for the implementation of ethical principles to make sure that any discriminatory biases are avoided	• Recently, there was a report of the COM on a green and digital transition. The debate was two sided. First: how can we make sure that tech or in this case AI is used in such a way that it helps the green transition; second, how can we make sure that digital solution is green and that AI solutions do not reinforce energy problems.

10.2.3.2.7 Overall findings

Among nine requirement categories discussed, three stood out for a significantly high rating: **data, services** offered by providers **and trainings**. Among these high rated requirements, participants showed the need to **access to existing databases** and to acquire knowledge on **methods to assess the quality of the data**. This goes hand in hand with the high score of *the services offered by providers* category, where participants cited to have the necessity to access a **catalogue of best practices for learning AI skills**, as well as **training modules on AI application to their domain**. Participants indicate also that having access to **funding programs**, as well as being **informed of AI challenges**, is crucial for growing and keep evolving in AI adoption.

One of the **main challenges** the participants cited to face with the **procurement of AI** was to measure the quality of the solutions offered, because the market offers a high number of providers and becomes challenging to make the right choice.

Lastly, it is interesting to point out that the lowest rated category is *Jobs,* where being informed of open job offers in the field of AI was the lowest ranked question. *Events* did not raise particular interest as well, specially being informed of professional fairs in the field of AI, contrasting with the relevant interest on being informed about regulation updates in the field of AI.

10.2.3.3 Local focus group

10.2.3.3.1 Introduction

This document outlines the outcomes of the Pre-PAI focus group held with several representatives of European local municipalities.

10.2.3.3.2 Purpose of the meeting

This engaging focus group session aims to explore the functionalities that would add significant value to public officers involved in or curious about leveraging AI for public services. Conducted via an online platform, the meeting spanned approximately 90 minutes, providing ample time for a comprehensive discussion.

During this insightful gathering, participants shared their perspectives and insights, delving into the potential applications of AI in public administration. From streamlining administrative processes to enhancing citizen experiences, the discussion revealed a diverse range of ideas and possibilities. The aim was to uncover the key requirements that an AI-on-Demand platform should fulfil to empower public officers effectively.

By understanding the unique needs and challenges faced by local public administrations, we can shape an AI-on-Demand platform that caters precisely to their requirements. This focus group session served as a valuable opportunity to gather insights and perspectives, setting the stage for future advancements in AI-driven public services.

10.2.3.3.3 Participants

City	Role of the participant
-	Project Manager – Open Agile Smart Cities
Helsinki	Project Manager
Messina	Project Leader – Urban Innovation & R&D
Amsterdam	Project Manager
Porto	Senior Researcher and Project Manager

10.2.3.3.4 Overall findings

Representatives from various municipalities shared their experiences and challenges related to the procurement and use of AI. The Helsinki representative presented how they are currently addressing challenges faced by **unemployed or fragile individuals and immigrants, with the use of digital solutions**. In the context of elderly care, the use of AI was highlighted as a means to provide motion support, alleviate loneliness, and address physical limitations. While the city of Messina is not actively procuring AI solutions, they are working on **understanding procurement clauses** and learning from other cities' experiences.

The focus then shifted towards the **needs of local municipalities in relation to the AI-on-Demand platform**. The participants discussed the potential value of such a platform in providing **useful content and facilitating knowledge exchange**. The desire to **share both successful and failed AI procurement stories** was expressed, as it would enable municipalities to learn from each other's experiences. Additionally, the suggestion of **creating a list of cities that have successfully implemented AI solutions** and making it available was discussed.

Ethical considerations emerged as a significant issue in acquiring AI solutions. The participants acknowledged the importance of ensuring that the procured solutions are effective and aligned with organizational requirements. They emphasized that in countries like Amsterdam, where AI is widely used and personal data protection measures are established, ethical concerns are less pronounced.

The conversation concluded with a focus on the need to address the processes involved in procuring AI solutions. **Managing pilot projects effectively** was highlighted as a crucial step towards successful AI procurement in the future.

10.2.3.4 Focus group with EDIHs

10.2.3.4.1 Introduction

This document outlines the outcomes of the Pre-PAI focus group held with several representatives of EDIHs.

10.2.3.4.2 Purpose of the meeting

This engaging focus group session aims to explore the functionalities that would add significant value to public officers involved in or curious about leveraging AI for public services. Conducted via an online platform, the meeting spanned approximately 90 minutes, providing ample time for a comprehensive discussion.

During this insightful gathering, participants shared their perspectives and insights, delving into the potential applications of AI in public administration. From streamlining administrative processes to enhancing citizen experiences, the discussion revealed a diverse range of ideas and possibilities. The aim was to uncover the key requirements that an AI-on-Demand platform should fulfil to empower public officers effectively.

By understanding the unique needs and challenges faced by public administrations, we can shape an AI-on-Demand platform that caters precisely to their requirements. This focus group session served as a valuable opportunity to gather insights and perspectives, setting the stage for future advancements in AI-driven public services.

Additionally, the meeting focused on exploring how the European Digital Innovation Hubs (EDIHs) can provide the correct services to public administrations through the use of AI.

By leveraging the expertise and resources of EDIHs, we can ensure that the services offered align with the specific needs of public administrations. This collaborative approach between EDIHs and public administrations aims to enhance the utilization of AI in the delivery of public services. The meeting served as a platform for exploring how AI-driven solutions can be effectively integrated into the existing systems and processes of public administration, fostering innovation and efficiency.

10.2.3.4.3 Participants

EDIH	Role of the participant
Consorcio Localret	General director
GR digiGOV-innoHUB	Project Manager and Data Scientist
CSI Piemonte	R&D Manager
EDIH-SH	Project Manager
Itainnova	Innovation Director

10.2.3.4.4 Overall findings

During the ranking of the AIoD platform categories, a significant discussion took place regarding various categories, such as Contacts, Services, Content, Funding Programs, Data, Jobs, and Trainings. **The prioritization of solution providers as top contacts emerged as a crucial aspect**. Establishing and maintaining contacts is of utmost importance for regional administrations, especially for beginners and new joiners in the AI field.

Trustworthiness and addressing ethical and legal considerations are vital for AI applications. Public administration requires clear guidelines and a roadmap to navigate ethical issues. The role of the European Digital Innovation Hubs (EDIHs) is to consolidate and streamline AI-related information for European sector bodies.

Access to best practices and guidelines is highly valuable for the EDIHs. Public administrations prioritize practical examples of best practices over academic approaches to AI solutions. By providing access to prototypes and existing solutions, valuable time can be saved, and reinvention prevented.

While EDIHs already provide similar services as funding programs, exploring additional services offered by funding programs can further enhance the support provided to public administrations.

The **quality of datasets** and staying informed about **existing initiatives for data sharing** and data spaces are key considerations. Assessing data quality involves both technical and legal aspects, making it a qualitative issue of importance.

Job postings are not the primary function public administrations rely on when utilizing AI.

To address the challenges faced by regional bodies in understanding and utilizing AI, a roadmap is necessary. Setting guidelines, establishing a structure, raising awareness, and building basic skills for interacting with AI are the first priorities. Training on legal aspects, leading to certifications, empowers public servants to engage in discussions about AI with suppliers and other public administrations.

By considering these aspects and establishing effective connections, AI initiatives can be implemented successfully within public administrations.

10.2.4 AI4GOV

10.2.4.1 The project work: detailed description of the activities

This document is a briefing on the AI4Gov Project work. It mainly contains the following elements:

- Challenge
- Calendar
- Evaluation
- Preliminary references
- Challenge

PW2 was developed in close collaboration with Intellera Consulting, and the EU-funded project Pre-PAI.

Task 2.3 “Public Sector /w Gap analysis” of Pre-PAI will be the main focus of the project work. This is related to the gathering of requirements for correct development of the AI-on-Demand platform, focusing on the public sector. This will require an analysis of the state-of-the-art with regard to the current use of AI tools in European public administrations. Furthermore, we will also need to organize some consultation activities with public sector bodies at the national, regional and local level including surveys, interviews and focus groups.

In strict connection to this, Master participants will be asked to carry out a design-led user research process to identify these requirements. The insights from the user research will inform the definition of User Stories that will support the identification of the requirements. The User Stories and requirements will be tested and validated with relevant stakeholders in a co-creation session led by master participants during the event of AI4Gov in Nuremberg.

(1) Calendar

17/02/2023 Friday	17:00-18:30	**Lect #1 Challenge presentation and discussion.** **Client proxy: EU project Pre-PAI** With Giovanna Galasso from Intellera Consulting and the participation of Martin Wellß, on behalf of Pre-PAI consortium **Pre-PAI:** The project Pre-PAI is set to: • gather and analyze the requirements for both public administrations as well as the user industry (SMEs and large industry) to be included in the AI-on-Demand platform; • provide a mapping of existing AI tools, including AI solutions already procured by public administrations in the Member States and identify gaps and future needs. This work should build on the information provided by relevant analyses and

		projects (such as AI4EU and analyses of the use of AI in public administration). **Challenge and objective**: PW2 focuses on a specific activity of the project, T2.3 "Public Sector /w Gap analysis". Led by Intellera Consulting, the task is related to the gathering of requirements for the public sector. For "requirements" we mean all those functionalities that end-users, public administrations in this specific case, would consider useful to find in the AI-on-Demand platform. **Client proxy**: EU project Pre-PAI
	19:15-19:45 19:45-20:30	**Lect #2 (POLIMI): Methodology, steps and outputs for PW2** Toolkit/tools to be used, list of specific outputs, timetable. **Group work:** <u>Project set-up:</u> each group focuses on (i) defining their specific objectives and (ii) making hypotheses on which PA to interview (What are the interesting levels/scales of governance? What are the main topics for a PA that needs to adopt AI? What are the main barriers - internal and external?). <u>Output</u>: Plan of the activities; who to interview (interview from 24/2 onwards). Tools**:** • Discussion on service safari • Sensemaking wall to identify the most relevant examples and their main features
21/02/2023 Tuesday	17:00-17:30 17:30-20:30	**Lect #3 (Intellera): AI procurement: key challenges and recommendations.** Overview of the key challenges to the public procurement of AI and insights from the literature and the Master's Thesis on AI Procurement; presentation of success factors and approaches adopted around the world to overcome the challenges. Recommendations and way forward. **Group work / Tutored:** Reason on needs to identify and define requirements, and problem reframing. **The activities will leverage preliminary desk research results.** According to the evidence consulted at the current stage, public bodies would give priority to the following requirements: • training/courses to increase AI knowledge and awareness among civil servants; • guidelines on regulatory sandboxing; • process automation;

		• ML processes to significantly improve accuracy and efficiency. Tools: • Stakeholder map • Stakeholder value map • Interview guide tool (part 1) ToDO: Send survey > fill and revise interviews
24/02/2023 Friday	17:00-17:40 17:40-18:30 19:15-20:30	**Lect #4 (Colin van Noordt): Which user requirements for AI adoption in PA? Barriers beyond recognizing the best solution.** **Group work:** Further explore the examples mapped and reason on their implication (entry level, skills & expertise, etc.). Revise the knowledge systematized in the **sensemaking wall**, adding the new layer of implications/requirements. Output: Draft of the interview questions, elaborating high-level contents from the questions presented in the questionnaire, with the main arguments to enquire. Tool: • Interview guide tool (part 2) • From needs to insights (start filling it after the interview!) Interview structure possibly starting from the one provided by the Client
28/02/2023 Tuesday	17:00-18:30 19:15-20:30	**Group work / Tutored** • From needs to insights (already after interviews) • Problem reframing (HMW questions) • User Stories Developing **user stories** **Review**

03/03/2023 Friday	17:00-18:30 19:15-20:30	**Group work / Tutored:** Developing **requirement** Group work / Tutored • User Stories • Idea elicitation = Collection of requirements **Review** (check with client)
07/03/2023 Tuesday	17:00-18:00 18:00-20:30	**Lect #5 (Intellera): Presentation of European projects on AI with a focus on the public sector** • GovTech / GovTech incubator • The EDIH landscape • ARTES 5.0 & DIH4AI, by Intellera • DT4Regions, by project partners. DIH, supporting regions in the development of AI-related solutions, Stefania Sparaco **Group work / Tutored** • User Stories Cards & definition of the requirements (Ideas elicitation) **Review by Intellera**
10/03/2023 Friday	17:00-18:30 19:15-20:30	**Group work / Tutored** • User Stories Cards • Define validation activities to run during the in-presence event in Germany: Validate requirements **Review**
14/03/2023 Tuesday	17:00-18:30 19:15-20:30	**Review** with Intellera of: • Final User Stories Cards (joint cards of paired groups) • Final requirements • Validation activities in Germany
17/03/2023 Friday	9:00-11.00	**Nuremberg, Open Event** • Introduction and setting • Validation workshop (1h) on user stories and requirements: 4 workshops in parallel moderated by 2 participants from the groups • Preliminary results presentation

7/04/2023		**Final delivery: user stories + requirements > with the new extended groups**
14/04/2023		**Public presentation of results**

(2) Evaluation

The project work will be evaluated on the basis of the quality of the assignment delivered. Groups will be asked to deliver mainly:

- A final report: as a short summary of the work conducted, including an explanation of the process followed, the main insights derived from the user research, the requirements defined, the results of the co-creation session in Nuremberg
- The design and implementation of the co-creation session in Nuremberg

Specific requirements to pass the module are:

- Attendance of at least 6 out of 8 online classes.
- Completion of the assigned exercise

(3) Preliminary references

- AI-on-Demand platform website: https://www.ai4europe.eu/
- User Stories: https://www.youtube.com/watch?v=LEPLaYcdgeg
- Relevant documents to build a knowledge base (attached)

(5) Output

- User stories
- Report with requirements

10.2.4.2 Joint group 1

10.2.4.2.1 Executive Summary

This document summarises the user stories and their relevant requirements that have been extracted from the interviews with Public Administrations across Europe. The result of this analysis is a list of requirements that will drive the enhancement of the AI-on-Demand platform, focusing on serving all different needs of the various stakeholders.

10.2.4.2.2 Methodology

For this research study, we followed the following step-by-step approach, under the supervision and guidance of POLIMI:

- Sense making wall: Identification of barriers and opportunities towards developing AI-based solutions that will improve/boost public services, by taking into consideration four different aspects of the organisation that will deploy the solution such as : use context, AI and technology, socio-cultural values, organisational context
- Identification of the target stakeholders that will be involved during the process
- Elaboration of key values for each stakeholder
- Preparation of problem-oriented interview questions to conduct user research based on the following categories: profiling, contents, tools and services, know-how, ecosystem & network, data, training, funding, infrastructure, initiatives
- Selection of the stakeholders to be interviewed, based on a set of inclusion criteria: 1) people working in a Public Administration, 2) are familiar with AI concepts and solutions, and 3) have experience with AI-based solutions in their organisation. Additional criteria considered: geographic position across EU, different governance level, and different domains represented. The details are provided in the tables below:

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4
Country	Spain	Greece	Cyprus	Azerbaijan
Governance level	National	National	National	National
Organisation	Ministry of Health	Ministry of Digital Transformation	Ministry of Research Innovation and Digital Policy	Representative of the leadership from 4th IRC
Role in the PA	Domain expert	Area manager	Head of Deputy Minister Office	Coordination team

Table 1 - stakeholders interviewed from group #1 and #3

- Conduct the interviews: dedicated one-to-one session of approximately one hour with each stakeholder. The questions have been sent in advance in order to facilitate the process and have a more open discussion rather than a standard interview.
- Build user stories from insights of the interview and dataset from survey prepared by Intellera Consulting and Pre-PAI consortium, with particular attention to acceptance criteria. For more information see section 10.2.4.2.3102Figure 18 - priority level 2.
- Use the User Stories to define a set of Requirements. The user requirements were
- Compiled based on the acceptance criteria of each user story.
- Join effort with another group and find common user stories and requirements. Four clusters were identified : knowledge exchange, legal resources, human and capital resources, training and education.
- Define the hands-on activities to carry out during the co-creation session in
- Nuremberg to validate the requirements. In order to do this, we designed first the storyline (see Figure 12 - storyline of the validation activity), including high-level description of the different tasks and roles.

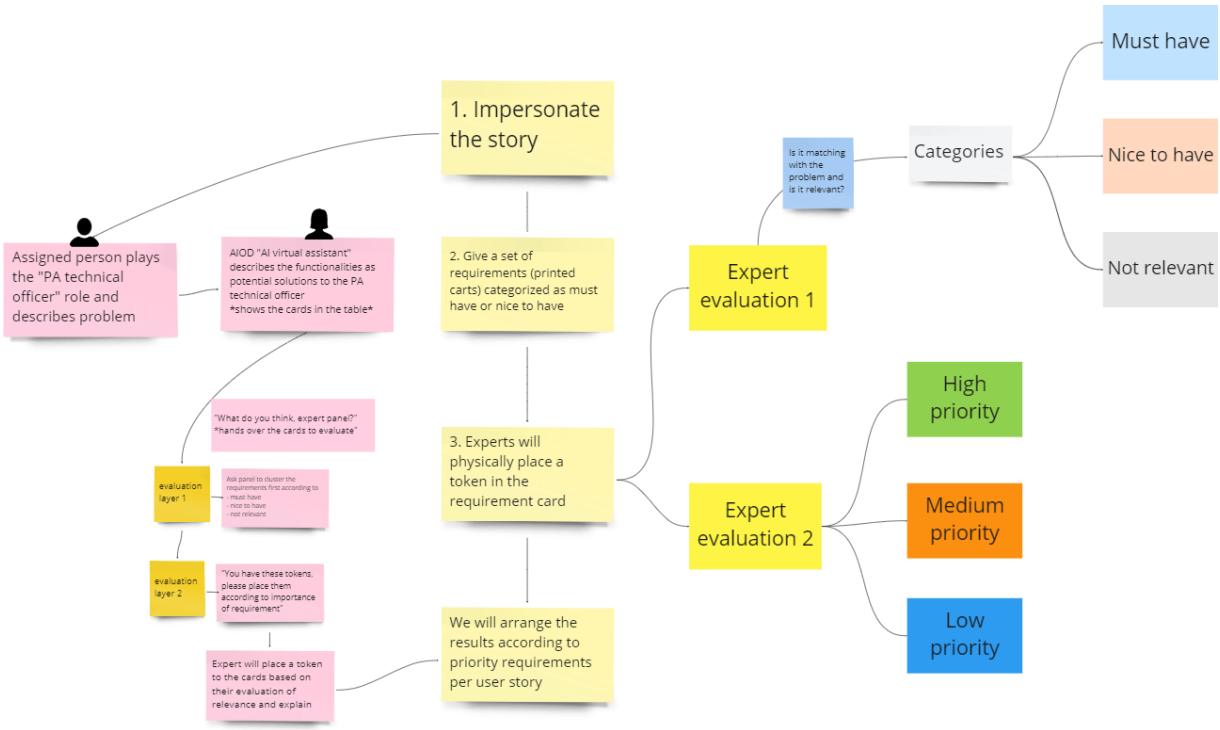


Figure 12 - storyline of the validation activity

An important aspect of the validation was the development of the Personas, which represent the different types of users, including PA officers/administrators, technical managers, procurement officers and legal

experts, which will be using the AIoD platform. This helped us to focus on the users' needs, experiences, and goals. Since we grouped the requirements in four groups, we defined four personas (one persona per cluster) with different positions, roles and contexts.

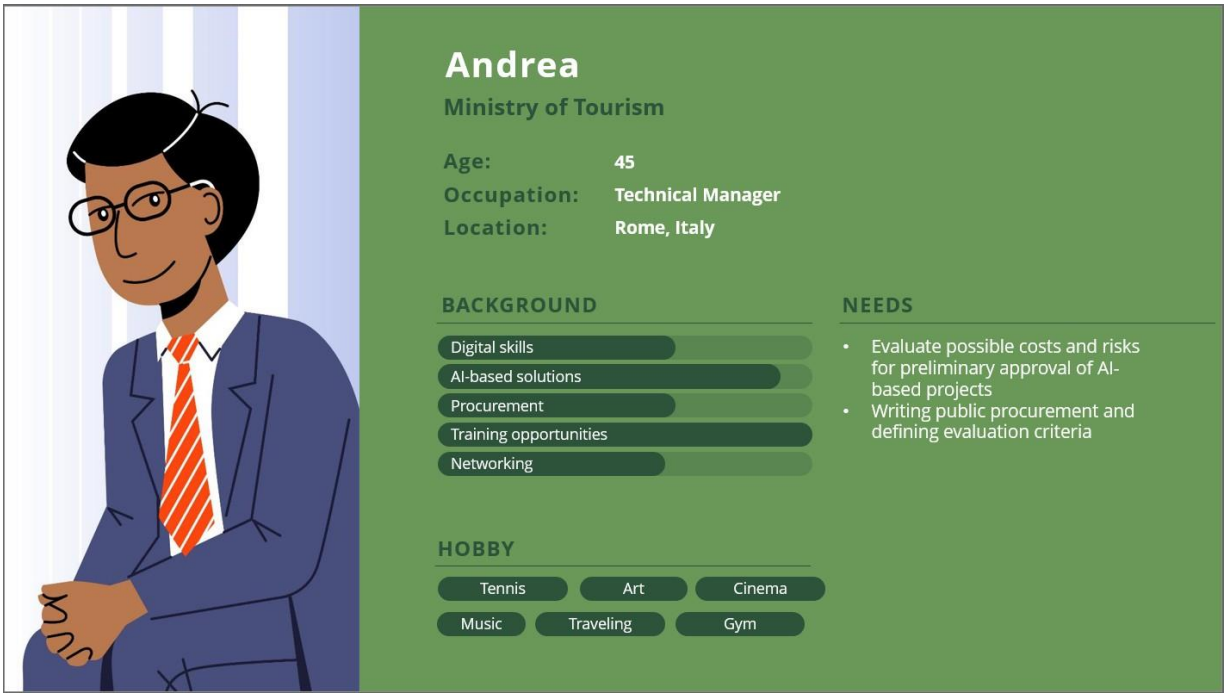


Figure 13 - persona 1

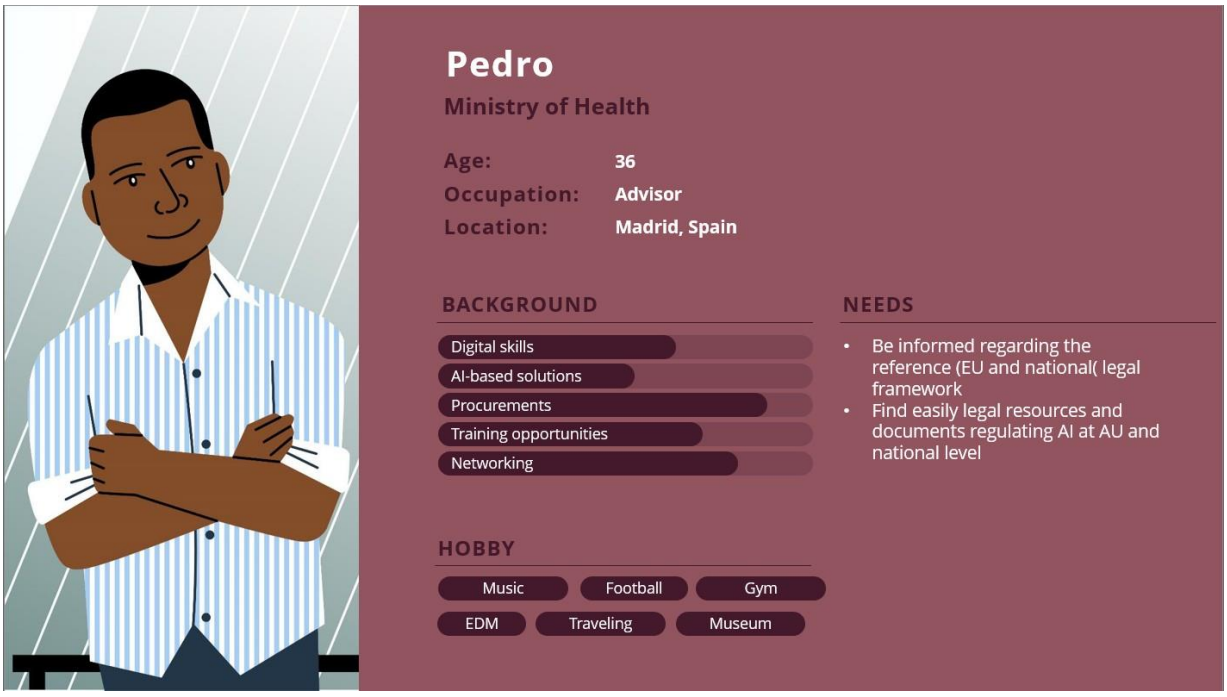


Figure 14 - persona 2

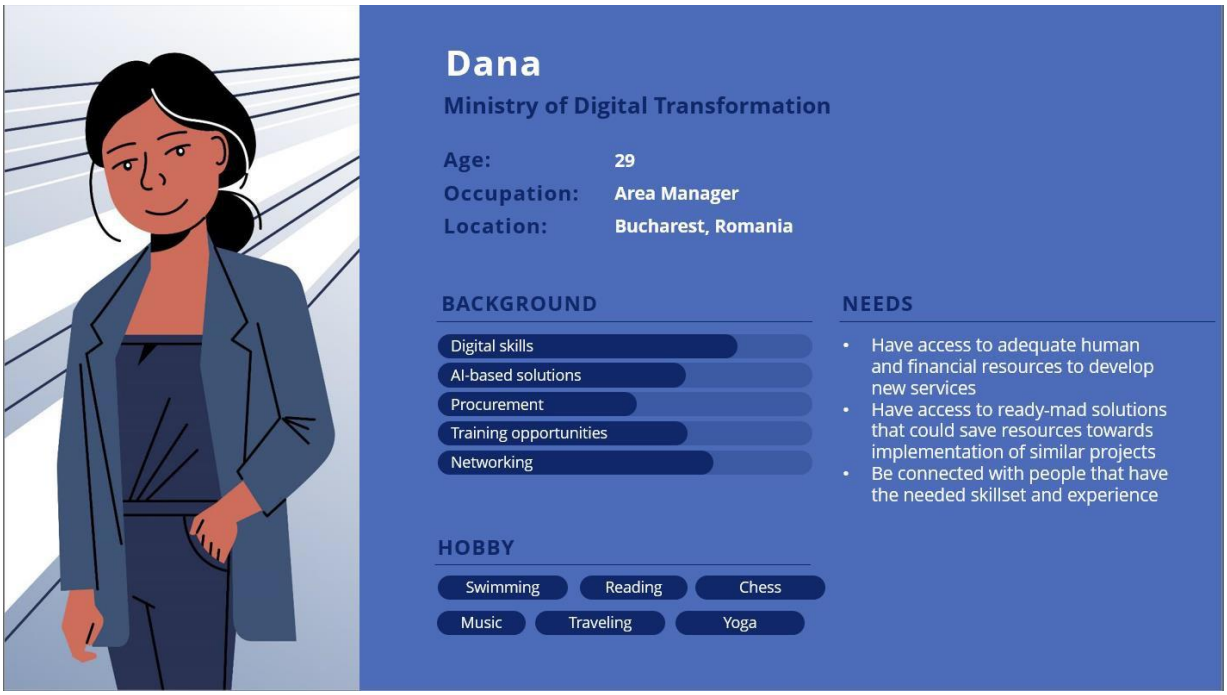


Figure 15 - persona 3

Figure 16 - persona 4

Regarding the Evaluation, we defined a two-level voting system: 1) at first, the PA officer was asked to assess the requirements in terms of priority level 1 – putting the printed cards with requirements in the relevant box of the canvas (*must have, nice to haven* and *not relevant*), 2) next, the PA officer had to vote in terms of priority level 2 - putting the coloured token on top of each printed card with requirements (*green = high, orange = medium,* and *blue = low priority*).

Figure 17 - priority level 1

Figure 18 - priority level 2

The results of this assessment are specified under each requirement (see chapter 10.2.1).

10.2.4.2.3 User Requirements

In this section, we provide the detailed description for each user requirements, following the same grouping in clusters as per the User Stories.

10.2.4.2.4 Cluster #1: Knowledge exchange

Section	Description
ID	REQ-JG01-1.1
Title	Provide a section with success stories of public procurement at EU and National level - Fail cases can also be included for better experience exchange
Type	FUNC

Description	Content PAs are not familiar with procuring AI-based services. Civil servants, advisors, and economists do not have the technical knowledge to write, procure, and estimate the timeframe and budget of tenders. They would like to access success/fail stories related to procurement of AI solutions by other PAs, at the same level of government or a higher one, possibly within the same country. Tools The PA officer wants to liaise with GAIA-X and other relevant initiatives that provide access to sandboxes and toolkits in order to ensure interoperability with existing frameworks/sub-systems.
Actor	User
Category	NICE TO HAVE
Priority	HIGH
Reference User Story	User Story 1, User Story 3

Table 2 - user requirement req-jg01-1.1

Section	Description
ID	REQ-JG01-1.2
Title	Provide a section with guidelines and useful resources (e.g., templates) regarding the procurement process, including how tenders are written and evaluated.
Type	FUNC

Section	Description
Description	Content PAs are not familiar with procuring AI-based services. Civil servants, auditors, and economists do not have the technical knowledge to write, procure, and estimate the timeframe and budget of tenders. They would like to have access to (i) guidelines on writing the technical specifications of the tender and defining evaluation criteria, (ii) templates and useful resources that can be re-used or used as a reference. Data Another obstacle that must be taken into consideration is the knowledge base and data management. For example, if a service is initially provided by Provider X, and after procuring again, Provider Y wins the bid and continues the service, due to this change there is a handover of work that has to be considered regarding the knowledge and data management. Jobs The PA should be able to hire external experts who can help to better define the technical specifications of tenders and the evaluation criteria to select the best offer.
Actor	User

Section	Description
Category	NICE TO HAVE
Priority	HIGH
Reference User Story	User Story 1, User Story 2, User Story 3

Table 3 - user requirement req-jg01-1.2

Section	Description
ID	REQ-JG01-1.3
Title	Enable tagging/filtering so the user can easily navigate content of interest about public procurements, by date, country, etc.
Type	FUNC
Description	Content The PA officer wants to have access and work under frameworks with public- private schemes. Hence, s/he should be able to filter available opportunities (e.g., by country, date, etc.) in order to prepare a proposal for tender tailored to the specific case.
Actor	Administrator/User
Category	MUST HAVE
Priority	MEDIUM
Reference User Story	User Story 1, User Story 2, User Story 3

Table 4 - user requirement req-jg01-1.3

Section	Description
ID	REQ-JG01-1.4
Title	Provide a forum/Q&A session where PA officers can exchange knowledge and experiences
Type	FUNC

Description	Content The PA officer wants to have a common space where s/he is able to express his/her own experience such as challenges in implementing AI solutions. The content may be grouped according to experiences or the domain (e.g., energy, financial, health etc.), where other references can be shared as supplement. This enables a means for reviewing and learning from collective knowledge. “It would be nice to have a dedicated space for exchanging knowledge and experiences among PA officers, at national or international level. The human interactions may also help in enabling adoption of more users in the platform.” - National Level (Azerbaijan) Tools Example of AI plug-ins that can be used to enhance such a feature could be an existing model for clustering topics. APIs from hugging face can be utilized.
	Initial exploration and training can be done using open-source tools or pay-per- use cognitive services. Data Existing datasets can be collected from existing public online forums, depending on their terms of use. It can also come from physical workshops done where stakeholders’ consent to digitize output of these workshops for training purposes is taken as part of the workshop design. Training Data literacy can be part of the training programme, where users are asked to have further engagements using the forum / Q&A session feature.
Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH
Reference User Story	User Story 1, User Story 2, User Story 3, User Story 4

Table 5 - user requirement req-jg01-1.4

Section	Description
ID	REQ-JG01-1.5
Title	Provide an evaluation system so the user can express their preferences on a content, including open source materials
Type	FUNC

Description	Content The PA officer has brilliant ideas that can be implemented and improve the daily routine in the organisation. S/he knows the main features and added values of the potential projects but has to provide evidence about the importance and efficiency to leadership. S/he prefers to have more information on similar projects implemented in the same domain by other PAs. Also, s/he needs an approximate evaluation of potential costs. Moreover, a preliminary risk assessment is needed to be provided for the first stage decision on the project before making big investments in the project launch. Services The AIoD platform could provide i) prediction capabilities counting approximately the budget for potential project according to the features and current success stories. This info is very preliminary and can be used to reason the importance, efficiency and capacity of the project and organisation, ii) analytics to calculate the risk index due to input criteria and provides main risks to be taken into consideration (general).
Actor	User
Category	NICE TO HAVE
Priority	LOW
Reference User Story	User story 1, User story 4

Table 6 - user requirement req-jg01-1.5

Section	Description
ID	REQ-JG01-1.6
Title	Provide advanced searching capabilities so the user can easily find information regarding public procurement
Type	FUNC
Description	Content The PA officer wants to get information about public procurements, and therefore, the information needs to be easily accessible and clear. For this reason, public servants need to work on appropriate tools and training to facilitate the process for the user. Services The user can benefit from advanced searching capabilities and be available funds should be ideally obtained by the national authorities.
Actor	User
Category	MUST HAVE
Priority	MEDIUM
Reference User Story	User Story 1, User Story 2, User Story 3, User Story 4

Table 7 - user requirement req-jg01-1.6

10.2.4.2.5 Cluster #2: Legal resources

Section	Description
ID	REQ-JG01-2.1
Title	Provide a section with (open source) materials regarding legal practices and applicable laws and regulations at EU (e.g., AI Act) and national level
Type	FUNC
Description	Content The PA manager is not familiar with the reference legal framework. S/he would like to have access to (open source) materials regarding legal practices and applicable laws regulating AI in order to adopt AI-based solutions through public procurements. The PA technical officer wants to know the reference (EU and national) legal framework in order to design and develop AI-based solutions and services for citizens compliant with the laws and regulations in force.

Section	Description
Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH
Reference User Story	User story 5, User story 6

Table 8 - user requirement req-jg01-2.1

Section	Description
ID	REQ-JG01-2.2
Title	Provide a section with use cases and best practices of successful (and unsuccessful) legal frameworks implemented across EU.
Type	FUNC
Description	Content The PA officer would like to access use cases and best practices of successful/unsuccessful implementation of legal frameworks across EU, in particular from PAs at the same government level. Contacts The PA officer needs to liaise with other departments and offices that already have implemented similar systems and capture any insights or blueprints to be used as a reference scenario for their specific case. Data Information can be retrieved from existing (open) datasets (e.g., law manuals, court cases, policy briefs, white papers etc.) and national online platforms that share the latest development in regulations and laws.
Actor	Administrator/User
Category	NICE TO HAVE
Priority	MEDIUM
Reference User Story	User story 5, User story 6

Table 9 - user requirement req-jg01-2.2

Section	Description
ID	REQ-JG01-2.3
Title	Enable tagging/filtering so the user can navigate legal practices and applicable laws and regulations of interests, by date, country, etc.

Section	Description
Type	FUNC
Description	Content The PA officer wants to easily navigate legal practices across EU so that s/he can use this information for their specific case. Therefore, the AIoD platform should create the conditions for that to happen. Services The AIoD platform may use AI services to optimize the navigation of legal practices and other relevant reference documents.
Actor	Administrator/User
Category	NICE TO HAVE
Priority	HIGH
Reference User Story	User story 5, User story 6

Table 10 - user requirement req-jg01-2.3

Section	Description
ID	REQ-JG01-2.4
Title	Provide advanced searching capabilities so the user can easily find information about legal frameworks implemented across Europe
Type	FUNC
Description	Content The PA officer needs support in terms of vertical skills, specifically about the legal framework in force. Public administrators have the need to find legal documents and resources regulating AI in order to adopt AI-based solutions through public procurements. Public technical officers want to know the reference (EU and national) legal framework in order to design and develop AI- based solutions and services for citizens compliant with the laws and regulations in force. Tools Advanced searching capabilities connected with EU and national regulations,

Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH
Reference User Story	User story 5, User story 6

Table 11 - user requirement req-jg01-2.4

10.2.4.2.6 Cluster #3: Human and capital resources

Section	Description
ID	REQ-JG01-3.1
Title	Provide a section with up-to-date information about funding opportunities (e.g., links to F&T / TED calls) for PAs across EU to finance own training programmes (also in conjunction with other PAs)
Type	FUNC
Description	Content The PA manager should have adequate human and financial resources to develop new AI-based solutions or upgrade the existing ones. Contacts PAs should build a network of contacts for accessing competitive bids and ensuring fundings from EU and/or National programmes and initiatives. Funding Information on funding opportunities, at EU and national level, can help secure the necessary financial resources and have access to innovative AI-based solutions developed within these projects/tenders. The PA officer wants to have a clear view about where, what and how to apply for external funding. Hence, s/he should be able to easily identify available opportunities. The AIoD platform could facilitate the process depending on the actor role, content and feasibility of the proposal with the funding requirements. For example, the EU's Funding and Tenders portal provides a useful resource for Research and Innovation in various fields, including AI. The other options would be Technology Innovation Fund (TIF), Venture Capitalists (VCs), Crowdfunding, etc. There are difficulties in coordinating who receives the funds, who administers, who executes and who follows up. For example, the Ministry of Health defines the objectives and dates, and the Ministry of Finance is responsible for accountability and monitoring in each autonomous community to review deliveries. Events Information about relevant events at the EU or national level (e.g., Info Days, Match-Making events, etc.) that can help the PAs connect with key stakeholders and establish collaboration opportunities.

Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH

Section	Description
Reference User Story	User story 7, User story 8

Table 12 - user requirement req-jg01-3.1

Section	Description
ID	REQ-JG01-3.2
Title	Enable tagging/filtering so the user can navigate funding opportunities of interests, by date, country, etc.
Type	FUNC
Description	Content The AIoD platform should enable tagging and filtering capabilities for PA officers/administrators in order to make it easier for them to navigate these various sections and find information relevant to their interests and needs.
Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH
Reference User Story	User story 7, User story 8

Table 13 - user requirement req-jg01-3.2

Section	Description
ID	REQ-JG01-3.3
Title	Provide an AI-based classification of users (PA officers/administrators or other stakeholders) based on their skillset, in order to suggest content, possible connections to other users/ongoing projects and geolocation based physical opportunities (user create a profile).
Type	FUNC

Description	Content The PA officers/administrators may collaborate on AI-based projects by sharing the research findings and exchange of knowledge and common ideas. Some of the opportunities could include attending AI conferences and events, AI-related workshops and training programs with specialized public service contents. Possible categories of users: PA Officers/Administrators (expertise in the field of AI and ML), AI Researchers (expertise in the field of AI and ML), Data Scientists (statistical expertise and ML), AI Developers (AI-based solutions software solutions and platforms), AI Consultants (AI technology, Law). Tools The PA officers/administrators possess a unique set of skills that can facilitate the successful implementation of AI projects and further development of AI models/tools. By using various tools such as Data visualization, NLP, ML, data analytics, communication tools can make more informed decisions, automate routine tasks, as well as to improve the overall effectiveness of public organisations/institutions services.

Section	Description
	Services Connections to other more experienced users and ongoing projects can help PA officers/administrators to stay up-to-date with the latest trends and best practices in the field of AI and to implement AI solutions to improve public services. Events Various events of EU/National/Local level in the fields of AI should be promoted within the AIoD platform for PA officers/administrators to stay up-to-date on the latest developments in AI and connect with other professionals in the field. These are some categorizations according to stakeholders needs assessment; AI for PA, AI and Ethics, AI and Smart Cities, AI and Health, AI and Social Services, AI and Education and many more.
Actor	Administrator/User
Category	MUS HAVE
Priority	MEDIUM
Reference User Story	User story 7, User story 8

Table 14 - user requirement req-jg01-3.3

Section	Description
ID	REQ-JG01-3.4
Title	The platform should provide a customized notification system based on the user profile and experience
Type	FUNC

Description	Content By providing a customized notification system, the AIoD platform could assist PA officers stay informed, engaged, and up-to-date on the latest developments in their field. The AIoD platform could also help to increase productivity and efficiency by reducing the amount of time users spend searching for information or keeping track of important deadlines and events. The platform should use ML algorithms to analyze a user's profile, including their job function and job duties, department/unit, and level of experience to personalize notifications and updates. Contacts The AIoD platform should have a responsive and accessible customer support system that provides users with the help and resources they need to maximize the benefits of the platform. Platform should include training and support, technical support, data management and security, as well as feedback and suggestions. Tools The AIoD platform should be user-friendly, intuitive, and customizable to meet the needs of different users and PAs and other relevant stakeholders. The platform should also be scalable and adaptable to changing user needs and technological advances in the field of AI.

Section	Description
	Data The AIoD platform should use a variety of data sources and analytics to make recommendations about which notifications each user should receive and how frequently they should receive them, while also providing users with real-time updates about events or situations that may impact their work or daily activities and/or require immediate attention.
Actor	Administrator/User
Category	NICE TO HAVE
Priority	MEDIUM
Reference User Story	User story 7, User story 8

Table 15 - user requirement req-jg01-3.4

Section	Description
ID	REQ-JG01-3.5
Title	Provide access to ready-made/common building blocks as a way to push PAs towards common, more interoperable services/systems (EU/National). Minimize resources needed by using already made building blocks.
Type	FUNC

Description	Content The PA officer wants to have access to ready-made solutions that could save them resources towards developing new, innovative AI services. There is a need to re-use cost-efficient solutions that have been developed for similar projects, achieving more interoperable services/systems both at European and National level. Services Through the AIoD platform, PA officers/administrators may have access to the following services: • eIDAS enablers that give access to free tools and support for building digital services in line with the eIDAS regulation. Such building blocks are eID, eDelivery, eSignature, Once-Only Technical System (OOTS), eInvoicing • a catalogue of reusable services that have been developed towards the implementation of the Once-Only Technical System • eHealth Digital Service Infrastructure (eHDSI) ensuring the continuity of care for European citizens while they are travelling abroad in the EU.
Actor	Administrator/User
Category	NOT RELEVANT
Priority	LOW
Reference User Story	User story 7, User story 8

Table 16 - user requirement req-jg01-3.5

Section	Description
ID	REQ-JG01-3.6
Title	Provide access to ready-made/common building blocks as a way to push PAs towards common, more interoperable services/systems (EU/National). Minimize resources needed by using already made building blocks.
Type	FUNC
Description	Content PAs that govern similar territories often find themselves facing similar challenges. In developing AI-based services or solutions to address local issues, working together with other PAs (from other cities, regions or countries) could be beneficial for everyone. When developing an AI solution from scratch or deploying a best practice in territory different from the one it was originally designed, joining forces can save costs, provide more insight/data, all while creating occasion for co-creation, contamination and exchange within different actors. Facilitating all this through the AIoD platform could ease the difficulties and burdens (bureaucratic, administrative, financial) that prevent this from happening, and even incentivize such experiments between PAs.

Section	Description
	Contacts Local ecosystems (AI solutions providers fitted, startup ecosystems, Venture Capitalists, innovation hubs) are an ideal set of contacts that PAs can reach out to, after having established a working dynamic within the platform. This would allow for cross contamination not just between PAs, but also between local ecosystems/service providers that are asked to tackle similar challenges.
Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH
Reference User Story	User story 7, User story 8

Table 17 - user requirement req-jg01-3.6

10.2.4.2.7 Cluster #4: Training and education

Section	Description
ID	REQ-JG01-4.1
Title	Provide a section for user to get access to (open source) training sessions / workshops and learning opportunities according to their level of AI literacy and topic of interest
Type	FUNC
Description	Content The PA officer wants to have access to (open source) training sessions/ workshops and learning opportunities according to their level of AI literacy and topic of interest. Data Use of open and private data to fully use the potential that ML could grant to the public sector, with an emphasis on reducing discriminatory, historical, racial, and gender bias from AI decision-making. Provision of data for Open-source AI projects for beginners: • TensorFlow • PyTorch • Keras • Detectron2 • Theano • MXNet • OpenCV • Fastai • TFlearn • HuggingFace transformers Training

	Training for PA officers/administrators and relevant stakeholders should cover AI concepts and terminology, data analysis and management, ML and NPL techniques, cloud computing, collaboration and communication strategies as well as ethical and legal consideration (AI Act, Trustworthy AI). For example, AI- based PA officers/administrators can connect with other professionals in their area to explore local AI ecosystem/s such as local meetups, university programs and government programs (funding for AI projects). Provision of knowledge could be also enabled through scientific publications /articles, see for example • "FRAMEWORK FOR FEDERATED LEARNING OPEN MODELS IN E-GOVERNMENT APPLICATIONS • Hello, World: Artificial intelligence and its use in the public sector • Artificial intelligence and digital transformation: competencies for civil servants Funding Annual budget. Events Lack of event spaces due to lack of personnel. There are civil society and private entities, there is a lack of communication with citizens. A good solution would be to improve the PA's ability to disseminate results to citizens. However, the translation of technical results into more understandable ones is a difficult task and must be addressed. Especially because the work carried out creates added value for society but requires special efforts to ensure that this value reaches all corners.
Actor	Administrator/User
Category	MUST HAVE
Priority	HIGH
Reference User Story	User story 9

Table 18 - user requirement req-jg01-4.1

Section	Description
ID	REQ-JG01-4.2
Title	Enable tagging/filtering so the user can navigate training sessions and learning opportunities of interests, by date, country, etc.
Type	FUNC
Description	Content The PA officer wants to have access to learning opportunities and training programmes available, possibly in their language. Hence, s/he should be able to filter available resources (e.g., by country, date, etc.).
Actor	Administrator/User
Category	NICE TO HAVE
Priority	HIGH

Section	Description
Reference User Story	User story 9

Table 19 - user requirement req-jg01-4.2

Section	Description
ID	REQ-JG01-4.3
Title	There should be a recommended training pathway depending on the user's level of knowledge and expertise.
Type	FUNC
Description	Content PA officers lack data science and AI literacy necessary to handle the citizen data and build AI models that provide efficient public service, therefore there is a need for provision of training pathways for PA according to knowledge and expertise. Training Provision of specific training curricula. Public servants could follow a training program provided from a company that is proficient in AI, and already has a contract with the organisation, to develop a new product. During the contract, public servants can be trained while the provider is delivering the product. Funding Annual budget. Jobs To start training and upskilling the workforce, the first task is to forecast the new wave of jobs and identify their corresponding skill as a constant and flexible process with expectation of change every five to 10 years.
Actor	Administrator/User
Category	NICA TO HAVE
Priority	LOW
Reference User Story	User story 9

Table 20 - user requirement req-jg01-4.3

10.2.4.2.8 Conclusions

The Public Administrations (PAs) deal with large amounts of data, and the use of AI can minimize costs and increase efficiency of the services offered to the citizens. This research study presented the possibilities of the AI-on-Demand platform to support the public sector needs, in terms of ensuring

knowledge exchange, providing legal resources, information on human and capital resources, and education and training programmes in accordance with their AI literacy.

After conducting several interviews with target stakeholders, conducting extensive research and analysis, it can be concluded that the AIoD platform could be a valuable tool for PAs across the EU. In order to achieve this, the AIoD platform should include a comprehensive database of case studies and best practices regarding the implementation of AI-based solutions, including information of public procurement and acquisition of necessary human and capital resources. Legal guidelines are also important, such as standard procurement contracts and regulatory compliance. Training and educational programmes are essential to ensure that PA officers are knowledgeable about AI and the entire data lifecycle. The focus on privacy and security is crucial, as it involves the proper management and processing of large amounts of data in public sector operations.

10.2.4.3 Joint group 2

10.2.4.3.1 Abstract

The objective of this project was to conduct a thorough analysis of the existing AI-on-Demand platform and identify areas for improvement to better meet the needs of public administrations at all levels. Through stakeholder interviews and a co-creation activity in Nuremberg, requirements were identified and organised into five categories: Content, Technical Tools, Data, Training, and Funding Programs. The findings revealed the need for the platform to be transformed into a more user-centric platform, with improved navigability and a well-defined taxonomy of content and services provided. Additionally, the platform was found to lack a strong connection to the needs of small municipalities, and as such, content and use cases must cater to the specific needs of different regions and municipalities to provide a more inclusive and effective tool for European communities of all sizes. The validation activity showed that the requirements accurately reflected the needs and expectations expressed by stakeholders. The conclusion highlights the need for significant improvements in the AIoD platform's architecture, content, governance, and user focus to better serve public administrations of all sizes and their diverse needs.

10.2.4.3.2 Methodology

The project comprised six major stages:

- Preparing a questionnaire for interview(s) with public administration representatives;
- Conducting the interview(s);
- Analysing the interview data;
- Developing user stories;
- Formulating a list of requirements; and
- Validating the requirements and acceptance criteria with experts.

Two separate groups, consisting of five students each, worked independently to complete stages

(1) and (2), utilising tools and techniques as detailed in the following Miro boards: Miro Group 2 and Miro Group 4.

After stage (2), the two groups joined forces to jointly analyse the data, develop user stories, and produce a unified set of requirements utilising clusters (Miro Joint Group 2).

To ensure the findings' validity, acceptability, and applicability, the group participated in a co- creation session with experts in Nuremberg. These experts provided valuable assistance in finalising the outcomes and confirming the acceptance criteria.

This cooperative and systematic approach laid a solid foundation for the development of an enhanced AI-on-Demand platform, specifically tailored to meet the distinct requirements of its users, as identified through the project.

10.2.4.3.3 Data Collection Method

A semi-structured interview approach was employed as a qualitative research method. This technique combined a pre-established set of open-ended questions (questions that stimulate conversation) with the flexibility for the interviewers to probe further into specific themes or responses as necessary.

By utilising semi-structured interviews, the project group was able to gather rich, detailed information while maintaining a degree of control over the topics discussed. Some interviews were also conducted in the interviewee's native language, to facilitate understanding of the questions and ease of expression while replying. This method proved effective in exploring the complex subject matter related to the AI-on-Demand platform and facilitated more natural, conversational engagement with stakeholders. The questionnaire used in the semi-structured interviews was made available in a Google Forms format.

Before the interview, all the required information related to the European AI-on-Demand platform was shared through an invitation email, which also included the Pre-PAI survey. The interview session was structured as follows: a 5-minute introduction of the European AI-on-Demand platform and the participants, a 50-minute session that followed the questionnaire as a guide, and finally, a 5-minute discussion on the next steps took place to conclude the interview. The aim of the interview was to gather more information regarding the requirements or demands of municipalities with less experience in AI.

The interview questions were grouped together based on several themes such as funding, ecosystem and network, data, infrastructure, best practices as well as initiatives and communication. These clusters helped to organise and categorise the interview questions for ease of analysis.

The project had the objective of comprehending the necessities of regional and local government institutions in different countries, including Italy, Greece, Portugal, Germany, and the Dominican Republic. This objective was pursued by conducting interviews, as previously mentioned, with key stakeholders from different administrative levels within these countries. The interviews provided valuable insights into the functioning and challenges faced by regional and local governments when accessing the European AI-on-Demand platform or when searching for support tools to develop AI projects in their administrations. A total of six interviews were conducted by the two groups. The participating institutions were categorised into three groups: central government, regional government bodies and local government bodies/municipalities. The interviewees were representatives from various organisations involved in economic development, public services, and infrastructure management.

Name of the institutions and stakeholders:

- Community Intervention Technician - Cascais City Hall
- Mayor - Lisbon City Council
- President- National Association of Portuguese Municipalities (ANMP)
- Chief Innovation Officer (CIO) - Freie Hansestadt Bremen / Free Hanseatic City of Bremen
- Municipal councillor (Sermide e Felonica, Mantua, Italy) - Responsibilities: Public Works and Economic Development Policies
- Vice-mayor (Sermide e Felonica, Mantua, Italy) - Responsibilities: Educational Policies, Social Policies, Association Policies and Promotion of the Territory
- President of the Central Union of all Municipalities in Greece - Responsibilities: Developing centralised solutions, managing resources and fundings, ensuring access to best practices, tools, and services for all municipalities in Greece
- Head of ICT Service & Head of Development, data governance and statistics - Italian Region of Emilia Romagna

The interviewees held various positions within the administration, including Directors, Deputy Directors, Heads of Area, Heads of Unit, and Staff/Officers. This diverse range of roles provided a comprehensive understanding of the inner workings of regional and local governments. Interviewees were also representatives of different degrees of preparedness and experience with regards to AI and development of AI projects within the public administration. The diversity of background of interviewees therefore also enabled gathering insights from different user personas.

By employing semi-structured interviews and engaging with participants in the AIoD platform walkthrough, the project was able to gather integrated feedback and a deep understanding of the stakeholders' experiences and needs when accessing the AI-on-Demand platform. This information will prove invaluable in tailoring the platform's offerings to better serve the unique requirements of regional and local government institutions across these countries.

Before the interviews, the survey (provided by Intellera) was also circulated to the stakeholders. However, the survey was deemed too technical and lengthy, with many questions being irrelevant or unanswered by the stakeholders. As a result, the simpler questions in our questionnaire proved to be more effective in guiding the interview process.

10.2.4.3.4 User stories

We have developed user stories to concisely and effectively illustrate what (potential) users of the AIoD platform aim to accomplish. To identify user needs for these stories, we used answers from the interviews and extracted various requirements from the responses. After grouping and consolidating the findings, we combined our existing user stories and grouped them in three clusters, presented below.

- **AI Use Cases, Best Practices, and Benchmarking**: These user stories emphasise the importance of providing civil servants with access to real-world AI examples and best practices. By learning from the successes and challenges faced by other municipalities, users can make informed decisions when implementing AI solutions within their regions.
    - “As a Community Intervention Technician, I should be able to optimise case management services so that individuals and families in vulnerable situations can receive the appropriate community resource”.
    - “As a small municipality I should be able to access successful examples in similar small municipalities so that they can consider replicating them and exchange information”.
    - “As the CIO of a regional government I should be able to find AI use-cases/case-studies from other municipalities/ regions/ countries on the platform to get inspired by other AI projects and get insights on how to start their first AI project”.

ACCEPTANCE CRITERIA:

- The platform should include events, projects, and communities of practice related to AI, all of which should have use cases with the same objective.
- The platform should have case studies of AI solutions that have been adopted and applied, which should present the vision, actions, method, data, experienced results, lessons learned, and room for growth.
- The platform should provide research resources on the topic of AI, with several use cases available.
- Use cases should be classified by topic, public sector level, budget, and the AI technology that has been used.
- The available use cases should generate insights into the vision, actions, method, data, experienced results, lessons learned, and room for growth.
- Information about the person responsible for the project, including contact information and the tools used, should be included in the use cases. Use cases should be described with the same metadata that can be filtered, such as the case applied to, size of municipality, list of target groups, cooperation with the private sector, etc.
- A search function should be available that can search through metadata and the content of use cases.
- **Training Resources and Offers**: This cluster focuses on delivering comprehensive training materials to civil servants, ensuring they have the necessary knowledge and skills to adopt and utilise AI technologies effectively. Offering resources for users with varying levels of expertise promotes a more inclusive learning environment and fosters continuous professional development.
    - “As a CIO of a regional government, I want access to existing IT infrastructure resources and training materials to enhance our AI capabilities”.
    - “As a CIO of a regional government I should be able to have guidelines and support on how to integrate AI tools in the existing IT infrastructure of the

organisation so that it is easy for him/her to implement AI tools in practice and adapt themto the existing IT infrastructure".
    - "As a public servant, I want to find relevant AI training resources tailored to my level of expertise to improve my skills".
    - "As a president of a town hall/city council I should be able to make data-driven decisions so that improve the efficiency of municipality's operation".

ACCEPTANCE CRITERIA:

- The AIoD platform must provide training resources that cater to users of all levels, from beginners to advanced users.
- The platform should offer user-friendly documentation, customizable options, and dependable technical support.
- Flexible research options should be available to allow customization based on the user's specific needs.
- **Matchmaking Procurement, Tenders, and Funding Opportunities:** Highlights the importance of providing civil servants with information about and access to funding opportunities to support AI adoption. Identifying and applying for relevant funding can help small municipalities overcome financial barriers and successfully implement AI solutions.
    - "As a small municipality, we want to identify AI-related funding opportunities through the platform so that we can apply for financial support".
    - "As a CIO of a regional government should be able to get easy access to funding opportunities for AI projects so that it is possible to test AI solutions even with limited financial resources".

ACCEPTANCE CRITERIA:

- Provide a list of funding opportunities in all EU languages, with filters for the following:
    - Funding by donor
    - Funding by target group
    - Min and max funding scheme
    - Co-funding rate
    - Timeframe
    - Possible partners

ELIGIBILITY CRITERIA

- Implement a notification system for new funding opportunities that meet the selected criteria.
- Offer clear guidelines on the application process for funding opportunities, including video tutorials.

10.2.4.3.5 Requirements

In this section, we present the requirements identified through stakeholders' interviews, that are organised according to five categories: 1) Content, 2) Technical tools, 3) Data, 4) Training, and 5) Funding programs. For each requirement, the team elaborates on the main findings and insights that emerged during the consultation process. These requirements have been prioritised based on the feedback and validation obtained during the Nuremberg session, ensuring that they accurately reflect the needs and expectations expressed by the stakeholders.

10.2.4.3.5.1 Requirement 1: Trustworthy AI and Ethical Approaches

Insight: Stakeholders highlighted the importance of trustworthiness and ethics in AI applications. Public servants with limited experience in AI may struggle to understand ethical implications and establish trust in AI systems.

Requirement: The AI platform should include a dedicated section that compiles resources and best practices on trustworthy AI and ethical approaches, featuring case studies, guidelines, and practical examples.

For instance, the platform could showcase previous examples of a public servant in charge of a social welfare program successfully implementing an ethical AI system to prevent biases, fraud and protect sensitive data, while maintaining transparency and trust.

10.2.4.3.5.2 Requirement 2: Cross-Sector and Cross-Border Collaboration

Insight: Stakeholders emphasised the importance of shared experiences of successful AI projects that benefited from cross-sector and cross-border collaboration. Public servants with limited resources could significantly benefit from collaborating with more experienced counterparts from other sectors or countries. When successful, cross-border collaboration, broadly speaking, has shown to have a wide variety of benefits, including regulatory effectiveness, economic and administrative efficiency.

Requirement: The platform should provide features that enable cross-sector and cross-border collaboration, such as dedicated forums, communication tools, and opportunities for knowledge sharing.

10.2.4.3.6 Technical Tools

10.2.4.3.6.1 Requirement 1: Comprehensive AI Toolkit

Insight: Stakeholders expressed the need for a range of tools and resources that facilitate AI development, such as AI libraries, data cleaning tools, ready-to-use AI bricks, AI infrastructures for testing, compliance tools for AI regulations (e.g., EU AI Act), and regulatory sandboxes. These resources would enable public servants and AI practitioners to develop, test, and implement AI solutions effectively while ensuring compliance with relevant regulations.

Requirement: The platform should provide a comprehensive AI toolkit, including but not limited to the following resources:

- AI Libraries: Access to popular AI libraries and frameworks that users can employ to develop AI models for various use-cases, (if possible, models that are replicable in public administration cases).
- Data Cleaning Tools: A set of tools for cleaning, processing, and preparing data to be used in AI models, ensuring data quality and accuracy (automated or pre-filled Jupiter notebooks or similar).
- AI Bricks: Ready-to-use AI components that can be easily integrated into AI projects, enabling rapid development and deployment of AI solutions.
- AI Infrastructures for Testing: Access to AI infrastructures, such as cloud services, that allow users to test and validate their AI solutions in a secure and scalable environment.
- Compliance Tools: Tools and resources to help users achieve compliance with AI regulations, such as the EU AI Act, ensuring that their AI solutions adhere to ethical and legal standards.
- Regulatory Sandboxes: Controlled environments where users can test and validate AI solutions under real-world conditions, while ensuring compliance with relevant regulations and policies.

By offering these tools and resources, the platform shall support the development, testing, and implementation of AI solutions in the public administration, while promoting compliance with regulatory requirements.

10.2.4.3.6.2 Requirement 2: Having a 'Try and Test' Playground

Insight: This feature aims to provide public servants with a risk-free, cost-effective environment to experiment with AI solutions. By offering a virtual sandbox, the platform enables users to familiarise themselves with the technology and build their expertise without incurring any expense or impacting existing systems.

Requirements:

- Scanning and Pairing with Major Manufacturers: The platform should facilitate connections between public servants and leading AI solution providers. This matchmaking feature would allow users to explore partnerships, tap into industry-leading knowledge, and potentially collaborate on projects that address specific municipal needs.

- Pilot Programs: The platform should encourage and support pilot initiatives, allowing public servants to test the feasibility and effectiveness of AI solutions in a real-world context before committing to a full-scale implementation. This approach minimises risks, ensures that solutions align with local needs, and fosters a culture of innovation and experimentation within the public sector.

10.2.4.3.7 Data

10.2.4.3.7.1 Requirement 1: Data-Driven Decisions

Insight: Local public administrations play a vital role as data providers by collecting, generating, and managing vast amounts of region-specific data. They are considered more user-oriented and closer to their constituents, emphasising the importance of purposeful and user-centric open data publishing to ensure reusability and impact.

Requirement: Local governments hold and increasingly publish datasets that are reused by national governments, while leveraging data to address regional challenges such as public safety, infrastructure, and environmental sustainability. A collection of these databases (links) could be made available on table format. By learning about the reusers from the public sector, their interests and needs, local governments can adopt a more demand-driven open data practice and shape their strategies to better serve citizens. It also sheds light on the needs of the local community to national governments for better decision making.

10.2.4.3.7.2 Requirement 2: Data Governance Model

Insight: Local public administrations need a credible and reliable platform, where data shared and stored is of high-quality, relevant, curated, and maintained up to date. They also need to be given adequate information and assurance on respect of privacy, security, and ethical norms.

Requirement: For the AIoD platform to be a reliable and trusted resource, it is essential to establish a robust governance model and assign a dedicated data curator, following the Data Management Association (DAMA) guidelines. This will ensure that the platform maintains high-quality standards, as well as accurate and up-to-date information. The governance model should comprise clear policies and processes for data management, quality control, and content updates, while addressing aspects such as data privacy, security, and ethical considerations. In addition, the data curator should be responsible for overseeing the platform's data and content, ensuring that it remains relevant, accurate, and aligned with user needs. This approach can also facilitate transparency, accountability, and trust, fostering greater collaboration and knowledge sharing among stakeholders in the AI ecosystem.

10.2.4.3.8 Training

10.2.4.3.8.1 Requirement: Civil Service Capacity Building (Upskilling and Re-Skilling)

Insight: Public servants often require capacity building in terms of AI knowledge and skills to effectively implement AI solutions in their work. This can be achieved through a combination of training programs, mentorship, tutorials, visual aids, and hands-on workshops.

Requirement: The platform should offer a curated selection of training resources, including tutorials and Massive Open Online Courses (MOOCs), specifically tailored to public servants. These resources should have a quality evaluation, such as a seal of quality, to ensure their relevance and effectiveness. Additionally, the platform should facilitate hands-on training workshops and bootcamps, focusing on topics like IT infrastructure, integration of AI tools in existing IT infrastructure, and interoperability. This comprehensive approach to capacity building will enable public servants to acquire the necessary skills and knowledge for successfully implementing AI solutions in their respective administrations.

10.2.4.3.9 Funding Programs

10.2.4.3.9.1 Requirement: Creation of a toolkit for AI Procurement Essentials

Insight: Small municipalities often face challenges in procuring AI solutions, as they may lack the necessary knowledge and expertise to assess the technical, functional, and legal aspects of these solutions.

Requirement: The platform should provide best practices and guidelines specifically tailored for small municipalities, focusing on the procurement of AI solutions. This information should cover technical aspects, evaluation metrics, interaction cycles of AI models, human factors, and legal and institutional considerations. By offering comprehensive guidance and the creation of a toolkit, the platform will empower small municipalities to make informed decisions when procuring AI solutions, ensuring their effective implementation and alignment with local needs and regulations.

10.2.4.3.10 Validation activity

To make the best use of the co-creation activity in Nuremberg, the team designed a user-friendly and comprehensive walkthrough of the AIoD platform, building on the various mapping schemes that the team had developed to reflect users' needs. Ahead of the co-creation session, the team also developed a detailed SWOT analysis, which focused on the platform's strengths, weaknesses, opportunities, and threats. This analysis allowed us to identify potential challenges and areas for improvement, as well as uncover opportunities for growth and innovation. Both the walkthrough of the AIoD platform and the SWOT analysis were used to facilitate co-creation session.

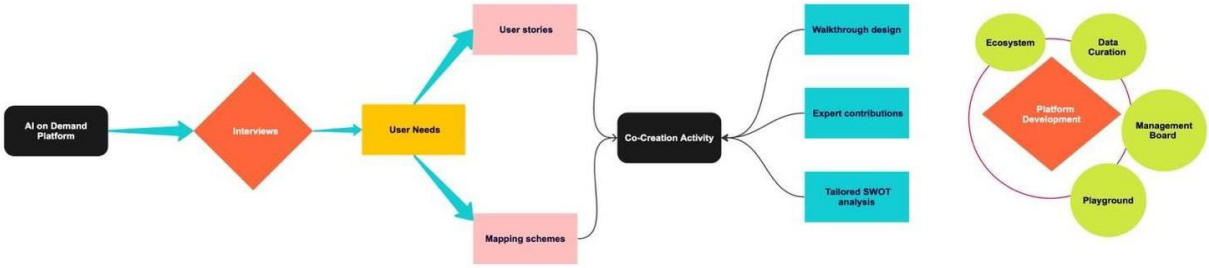


Figure 19 - activities conducted during the project work

The collaborative effort in Nuremberg involved bringing together experts from diverse backgrounds and fields to provide their valuable insights on the requirements and acceptance criteria developed by the team, and therefore contribute to a more robust platform design. The contributions from experts played a significant role in refining and prioritising the identified requirements, offering unique perspectives and specialist knowledge to refine the platform's features and capabilities.

If we were to describe the design cycle and the number of interactions for this project, we would emphasise the importance of continuous collaboration, feedback, and iterative improvements. Throughout the development process, various stakeholders provided their input and expertise, hence shaping the project to better address user needs and expectations. Multiples rounds of interaction took place, with each cycle consisting of gathering feedback, making enhancements, and presenting the updated version for further review. This iterative process ensured that the analysis was thoroughly refined and tailored to meet the evolving requirements of its target audience. In summary, the design cycle of this project, even in its short time duration, was marked by numerous interactions and a strong commitment to co-creation.

10.2.4.3.11 Conclusion

The work conducted in this project has allowed a thorough analysis of the existing AIoD platform, its current features, as well as potential areas for improvement.

The AIoD platform already includes a wealth of information and tools and represents potentially a very useful support for public administrations embarking in projects for improving service delivery and internal processes through AI. The analysis of stakeholders' needs has however revealed that the platform would benefit from enlarging the range of tools and information provided. This will improve its

relevance and usability for a variety of users, from small municipalities to more experienced technical officers.

The analysis has also revealed two key shortcomings that deserve consideration.

First, the platform operates more like a website than an interactive platform, which limits its usability and accessibility. It is essential to transform the AIoD platform into a user-centric platform, with improved navigability across sections. This requires refining and redesigning the platform architecture, according to a clear structure, a well-defined taxonomy of content and services provided, and methodology for use. Data governance mechanisms should also be clearly defined.

Second, the platform currently lacks a strong connection to the needs of small municipalities. While larger administrative bodies (e.g., regions), are often more prepared to adopt AI, mainly because they can rely on dedicated technical staff, small municipalities lack information on how AI could be used in their context, and where to start in their journey for AI use. To address this shortcoming, there is a need to provide content and use cases that cater to the specific needs of different regions and municipalities, considering factors such as demographics (population age), and primary domains of interest (e.g., agriculture, tourism, health). In this way, small municipalities can leverage the expertise and resources of larger administrations that have advanced AI and technology capabilities. This will truly allow the AIoD platform to become a more inclusive, effective, and accessible tool for European communities of all sizes.

In summary, to better serve public administrations of all sizes and their diverse needs, the AIoD platform must undergo significant improvements in its architecture, content, data governance, and user focus.

10.2.4.4 Joint group 3

10.2.4.4.1 Methodology

In the initial stage of the project, a preliminary exploration of the existing AI-on-Demand platform was conducted to extract valuable insights pertaining to its current functionalities, potential difficulties, and barriers that need to be overcome. Subsequently, four interviews - using a semi-structured interview approach - were conducted with relevant stakeholders in the artificial intelligence domain to further broaden the scope of the research. Data gathered from a public survey conducted by Intellera and other project partners was also analysed to identify the significant points that the AI-on-Demand platform needs to incorporate. Moreover, leveraging the resources provided by the AI4GOV master, such as the stakeholders map, a new problem frame was established after a thorough analysis. The problem to be addressed was identified as the creation of an artificial intelligence community where citizens and public officials can collectively learn from use cases, examples, and best practices.

To bridge the gap between needs and final requirements, several user stories were formulated. Multiple requirements were subsequently developed, incorporating a fresh perspective to the platform that addressed our needs. A co-creation session was then held in Nuremberg, Germany, wherein two experts in the AI domain provided valuable insights and validated the requirements deemed useful. Finally, to conclude, the requirements identified as significantly valuable by the experts were retained and proposed in this report and in a further presentation.

Country	Administrative Levels Covered	Typology of institution	Role in Administration	Other Information
Luxembourg	EU Commission	EU	Head of Sector	
Bruxelles	EU Commission	EU	Head of Unit for IT & Business Intelligence	IT Department

Slovenia	Ministry of Foreign Affairs and EU Affairs	National	Policy Officer	

10.2.4.4.2 User stories

The Problem Reframing tool was our guide as individual groups to land into our How Might We (HWM) questions, that were focused around some pillars:

- building an AI Community;
- reducing the barriers for the adoption of AI solutions in the Public Sector;
- allowing PAs in being able to deliver more impactful and efficient services;
- keeping the citizens at the centre.

Starting from this key point in common, as a joint group we have structured the following new and univocal HMW question that managed to be the answer to our necessities and aims:

SCENARIO

How might we facilitate and support an AI community to allow PAs to adopt AI that improves the efficiency and quality of services to the citizens?

EXPECTATION

As individual groups, we have also worked on some User Stories related to our personal HMW question. This process allows us to collect ideas of something that was effectively applicable to the real life of our stakeholders. Lastly, the Ideas Elicitation tool was the perfect way to cluster our main aims identified during the User Stories' design.

As joined groups, we had a total of nineteen User Stories to re-cluster and from which start to re-define the ideas that we had as individual groups. Altogether and taking into consideration our jointly HMW question, we have decided to divide our User Stories in four brand new clusters that were substantially the four macro themes that for us were more important to develop.

The four clusters in which we have divided our User Stories were the following: Welcome to AI, AI Community, Catalogue of AI use cases, Content Control for Responsible AI.

While the first category "Welcome to AI" is aimed at PA officials who have little or no experience and knowledge of AI and is aimed at basic understanding and acceptance, the next categories "AI Community" and a "Catalogue of AI Use Cases" build on this and are aimed at networking, broadening experience and expanding existing knowledge, overall and within one's own field/application area if desired. The last category "Content Control for Responsible AI" can be seen as an arc that embraces everything and influences the other categories by ensuring high quality and ethical content.

10.2.4.4.3 Welcome to AI

2. 1. 1. A Policy Officer in a Public Administration should be able to understand the possibilities of AI so that he can deliver higher quality work (better summaries, better research, better advice)

RELEVANCE:

Policy officers need to process huge amounts of information. They read, analyse and understand a lot of documents each week/day, having to dive into new topics often. An AI application can help the user create summaries of long texts, conduct initial research on new topics, and provide the user with a detailed overview of subject areas, especially unfamiliar ones. By outsourcing those simple preparatory activities, the policy officer can focus on important details and make a more reflected indication/ advice in the end.

ACCEPTANCE CRITERIA:

- well explained examples
- explanation is given in non-technical language
- overview of available AI tools
- filter for relevant applications
- collection of use cases

2. 1. 2. A Public Employee should be able to understand the AI possibilities and limits so that their fear of AI would not become an obstacle for innovation and improvement

RELEVANCE:

A long time PA employee needs to be able (and interested) in transitioning from his established work practices into an AI driven solution. This may require new sets of skills, and possibly an adaptation period, which may be unsettling for many of them.

ACCEPTANCE CRITERIA:

- specific positive examples/use cases
- filter for relevant keywords/solutions/fields of application
- understandable explanations
- results focused
- relatable (seniority-appropriate)
- training on AI tools to be used on the identified use cases
- training on specific solutions
- gamification within that training (to make it more enjoyable)

2. 1. 3. A Public Employee should be able to understand the limits of AI so that they lose the fear of being replaced by it.

RELEVANCE:

When offered the option of integrating AI in their work, a public employee needs to understand what AI will do. They need to know the scope of the AI solution, so that their role in relation to the new technology is clear, as uncertainty about this may make them feel reluctant to change their ways, and worried about being replaced by AI.

ACCEPTANCE CRITERIA:

- intuitive search of AI applications relevant to PA environments by task performed, rather than by the algorithm/approach used (avoiding technical language)
- clear overview of AI dos and don'ts
- clear presentation of "human in the loop" approaches in AI applications relevant to PA work environments
- searchable, reasoned examples of PAs that chose humans over AI to perform certain tasks
- clear statement within each use case what are the limits and what would be the interface between each application and the public employee

2. 1. 4. A Public Employee should be able to understand the limits of AI so that he can understand that AI cannot solve all work-related challenges.

RELEVANCE:

When a new technology becomes popular, it is easy to be too optimistic about what it can offer. To avoid too high expectations in a possible change through new solutions resulting in disappointment where AI is deployed, the limits need to be understood in general but also in the specific field / for the specific scenario where AI is going to be implemented. Having clarity about the boundaries helps to optimise the use of AI, and at the same time the PA knows clearly from the beginning in which areas it makes sense to continue to invest time.

ACCEPTANCE CRITERIA:

- clear overview of AI dos and don'ts
- relatable examples of AI success and failures
- searchable reasoned examples of AI failure to perform PA-related tasks
- clear statement of the boundaries of an AI application / use case has
- what is the interface between AI and the public employee

2. 1. 5. A Public Employee should be able to easily understand examples of AI use cases so that he does not lose interest during the process

RELEVANCE:

As a (long term) Public Employee, it might be challenging to dive into such a vast new topic as AI. To prevent them from feeling overwhelmed by the abundance of information and possibly also a corresponding lack of clarity and to prevent them from losing interest due to a lack of quick concrete results, examples should be concrete and clearly understandable, there should be the possibility to easily find examples that are relevant to the concrete area of application and these should be easy to learn through interactive learning, progress tracking and constructive feedback.

ACCEPTANCE CRITERIA:

- clear and concise examples
- easy search and filtering
- interactive use case simulations
- progress tracking and feedback

2. 1. 6. A Public Employee should be able to receive appropriate training on new technology before its adoption to avoid dependency on OJT (On Job Training) skills

RELEVANCE:

As OJT is strongly dependent on personal characteristics and traits, it can be intimidating for many PA employees. Giving enough time, and the proper training tools, can reduce the stress linked to the initial stages of use. The familiarisation provided during this period can also be used to identify specific problems of the UI in an earlier stage.

ACCEPTANCE CRITERIA:

- training options available for different applications /scenarios
- enough time for familiarisation
- identification of user pain points
- reduction of stress at the implementation

2. AI Community

2. 2. 1. PA officials should be able to join an AI community so that the PA Official is informed about the state of the art within AI

RELEVANCE:

In order to be informed about the state of the art within AI and to communicate with and learn from like-minded peers and frontrunners, I need to be part of a community within the AI domain. I need to have access to a website and forum that allows me to exchange and interact with users and developers on AI-related resources and use cases. I can log in and go to a forum in order to have access to the community and resources. For instance, I need to be able to post on a forum in order to raise questions or make requests to a community of users and owners. I can take part in webinars in order to be informed about resources and use cases and be able to ask questions during the webinars to peers and providers.

ACCEPTANCE CRITERIA:

- a common space (forum?) for exchanging on the resources/use cases is available
- webinars for the community to exchange on resources/use cases
- users of the AI platform can post on the forum
- owners/users need to log in to post in the platform
- users can connect with peers and other PA officials with similar challenges

2. 2. 2. PA officials should be able to use a catalogue of the top 10 AI use cases selected based on a voting mechanism among peers and relevant criteria so that the PA official stay informed about the state of the art within AI for the Public Sector

Relevance:

I can access the website, where there is a list of the most popular use cases of AI Solutions implemented by another PA. The top 10 most popular use cases are calculated based on the number of votes from peers and downloads on the platform. I can also filter the top 10 use cases selecting relevant criteria, such as date, the type of use case or the type of PA. By doing so, I will be informed of the most relevant use cases that could facilitate me to understand the state of the art of AI in the Public Sector.

ACCEPTANCE CRITERIA:

- the top 10 results are displayed in the platform
- option to filter by relevant criteria (Country, type of PA, month and year, type of AI service...)
- users can vote on published use cases whether the presented case would be useful or is actually used in their PA

2. 2. 3. A PA official should be able to reach out to the owners of the resources and use cases so that they can ask questions in case of doubts or explore further the underlying use case.

RELEVANCE:

I can access a platform that allows me to easily browse resources and detailed use cases, so that I can gain a better understanding of how to use these resources effectively. For each resource / use case it is easy to contact the resource owner to reach out to them with questions and concerns as well as request additional information or clarification where necessary - maybe even ask them to collaborate on a project. The platform should serve as a one-stop-shop for all my resource and use case needs, providing me with the necessary tools and information to effectively use these resources within my organisation.

ACCEPTANCE CRITERIA:

- each resource has an assigned owner
- resource owner commits to exchange with the interested users of the AI platform
- a common space (forum?) for exchanging on the resources/use cases is available
- users of the AI platform can post on the forum
- owners/Users need to log in to post in the platform

2. 2. 4. A user should be able to vote and share feedback on the use cases and experiences so that the most useful contents are spread

RELEVANCE:

When I get familiar with the specific content (AI use cases or experiences), I have an opportunity to share my impressions. One of the options available is to vote on the content by assigning a score to the content with which I have interacted (read, downloaded, tested etc.). This voting/scoring will then feed into the ranking of the most popular content. I can also leave my feedback on the content so that the content owner can learn in more detail what my opinion was. Furthermore, I have a possibility to share this content with other users outside the AI platform via social media or by sending an email with the link.

ACCEPTANCE CRITERIA:

- voting button is place allowing to give feedback on the content
- scores are defined
- sharing of content on social media is available
- sharing of content (link to the content) by sending an email to other users is available

2. 2. 5. PA officials should be able to share interesting use cases and relevant knowledge related to the implementation of an AI tool for Public Sector so that other PA officials could be inspired and learn from this information

RELEVANCE:

I have access to a website where there is a search bar and filters to look for information on use cases and know-how. If there is something useful, I will be able to study and get ideas from the use cases, then I could contact the PA if necessary. If I have some doubts about what I am able to do on the website in which I am, I am sure that I will find the information that I need inside of it. If this is not enough, there are ways to find and reach out to people that are involved. I am also sure that the website will be accessible by design and that every section of it will contain the answers to my questions. In this way, me and my organisation will be able to find information about AI trends, insights, opportunities / enablers, challenges / barriers so as we will be able to provide more efficient and impactful public services to citizens.

ACCEPTANCE CRITERIA:

- create a moderated portal for PAs to share relevant information.
- clear layout to publish information on the portal is available.
- short guidance on how to publish use cases/resources.
- PA Official (owner of the use case/resources) needs to log in to the AI platform to publish their resources.
- an acknowledgment of the upload is sent to the PA (informing on the review)
- an acknowledgment is sent once the info is published (after the review)
- a PA official needs to have a possibility to interact with other interested users of the platform (forum)?

AI USE CASES CATALOGUE

2. 3. 1. A Public Employee should be able to have low threshold access to a repository of AI use cases so that he can find fitting examples for his own work.

RELEVANCE:

Public officials operating in different sectors can be more open to use cases coming from fields with similar challenges. Observing the implementation of AI tools can not only reduce the inherent doubt many nurtures towards changes, but also stimulate potential creativity. By reducing the barriers to access such use cases, and expanding the cases, it can appeal to a wider range of PA. To help them in their work it would be good if they can easily find fitting examples without any barriers (as logins or other requirements), if they can find those use cases organised by industry, job function or else to find examples that fit to their needs, if they can find AI solutions that solve problems that are similar to their own to learn from those experiences and finally also if they can share their own examples and experiences to help others but also get feedback or new ideas from other users.

ACCEPTANCE CRITERIA:

- low-threshold access.
- organised browsing and search / filter option
- access to examples from other institutions
- ability to contribute and share examples
- receive feedback to own examples

2. 3. 2. A Policy Officer in a PA should be able to use AI to monitor and filter content in documents so that he can better coordinate the involvement of other institutions.

RELEVANCE:

As a Policy Officer in a PA, it would be helpful to use AI to automate some tasks as scanning and summarising documents while identifying the relevant content, filtering irrelevant and redundant information, monitoring changes in policy documents in real-time and identifying patterns or trends to overall be able to work quicker and more efficiently and deliver higher quality work by focusing on the most important parts, avoiding wasting time and involving relevant institutions and people right from the beginning.

ACCEPTANCE CRITERIA:

- accurate content identification.
- effective filtering system.
- real-time change detection.
- accurate pattern recognition and visualisation.

2. 3. 3. A Public Employee should be able to see and experience successful AI use cases so that he can see the value in AI-based solutions for his work.

RELEVANCE:

A Public employee needs to find good examples of different usage of AI. These good examples can be adopted into his own organisation to create value.

ACCEPTANCE CRITERIA:

- easy to find good examples of successful AI implementations
- clear description of the value for an organisation
- good descriptions of how to adopt these solutions

2. 3. 4. PA officials should be able to find relevant information and resources about experiences and use cases so that they can learn from peers in the same domain.

RELEVANCE:

I access the website in order to find relevant information and resources concerning AI experiences and use cases. I need to be able to find information in order to get insights and learn from peers in the same domain. As a user, I navigate the website and rely on search and filtering options in order to find the information I need. For instance: I sign up for a newsletter in order to be informed about future updates and new information.

ACCEPTANCE CRITERIA:

- clear bar, allowing user to navigate for relevant information and resources
- filters are available on the platform to allow the user to narrow down the search
- search option is available to users so that they can indicate what they are looking for
- the user can subscribe for newsletter by supplying their email address and indicating areas of interest
- user gets a “Thank You” message telling them they have subscribed successfully

2. 3. 5. PA officials should be able to download the existing AI resources and use cases so that they can test them themselves on their devices/infrastructure.

RELEVANCE:

As I access an AI platform containing resources and use cases with detailed documentation, I like to have all of them easily downloadable so that I can use them on my own devices and infrastructure. This will allow me to test these resources so that I can ensure that I am using the resources correctly and effectively. As I use them, I also want the ability to customise and fine-tune these resources and use cases to better suit my organisation's specific needs so that I can derive maximum benefit.

ACCEPTANCE CRITERIA:

- download button is available for the downloadable resources
- API available
- user needs to log in before downloading the resources/using API
- details of users that downloaded the resources/API are stored in the database

4. Content control for responsible AI

2. 4. 1. A Public Employee should be able to grasp the impact of implementing an AI tool so that he is able to use AI responsibly

RELEVANCE:

Public servants should be well-equipped to use AI responsibly and ethically to prevent unintended harm to the public and potential lawsuits against state entities. An understanding of the potential consequences of using AI irresponsibly should be clearly explained and communicated. The training can cover content from databases like the AIAAIC https://www.aiaaic.org/aiaaic-repository/ai-and-algorithmic-incidents-and-controversies.

ACCEPTANCE CRITERIA:

- training content to cover ethical principles that govern the use of AI
- case studies of adverse events resulting from the irresponsible use of AI should be included in the training

2. 4. 2. An admin/reviewer should be able to review/moderate/control the proposals of use cases and content so that only high-quality and ethical content is finally published

RELEVANCE:

I can access the backend of the website where I can find a list of all the proposals of use cases and content that other PAs have been uploaded, and I will check which of these need to be reviewed. I will review those considering defined criteria that respect high-quality and ethical standards. After the review, I will send the document with some notes, if a review is needed, or the confirmation of the publication of the content to the PA officials who have submitted the case. The content will be published in the library of use cases and content available on the website. In this way, my organisation and I will ensure only high-quality and ethical content will be published.

ACCEPTANCE CRITERIA:

- no unethical or illegal content is published
- content is not published until the approval
- rejected content should be listed
- reviewers should be able to flag the reasons of rejection for further moderation
- list of unreviewed proposals accessible to the admin/reviewers

2. 4. 3. A user should be able to report non-ethical content so that the quality is ensured.

RELEVANCE:

I can access the website, where there is a list of all the use cases and content that other PA officials have already

published. While using it, I will be able to report if a non-ethical content has been uploaded and needs to be reviewed again. After the report, I will be contacted by the reviewer's teams with the results of their analysis and the reported content is going to be kept or not, depending on their results.

ACCEPTANCE CRITERIA:

- a button to report content is available
- short info is provided to users what is the purpose of the button
- a field is provided to enter why the content has been reported

10.2.4.4.4 Requirements

This section outlines the requirements identified as part of the data collection and validation activities. The requirements are presented against a list of categories (i.e., content, contacts, etc) and with information about real needs and prioritisation. The latter is grounded in the interviews, survey and validation workshop conducted in Nuremberg where stakeholders were consulted on the needs and priorities.

10.2.4.4.4.1 Content

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived high relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Content	PA Officials	Requirement 3.1.1: Feed the platform with relevant use cases and experiences of AI Solutions	it will help them to become more efficient by reusing others' impactful AI solutions
Content	PA Officials	Requirement 3.1.2: Share content for dedicated sessions/webinars with the top-rated AI use cases to spread it further	be inspired and learn from this resources and content
Content	PA Officials	Requirement 3.1.3: Share with others what made my PA more efficient and receiving feedback from it	improve the public services they provide to citizens
Content	PA Officials	Requirement 3.1.4: AI solutions and tools that are directly applicable to the PA's specific needs and use cases	“Most of the studies related to AI are out of Academia in the private sector. Maybe it could limit the deployment of Public AI solutions”.
Content	Platform Owner	Requirement 3.1.5: Publish content in non-technical language and develop an inventory of AI use cases with technical and non-technical information	“AI is still really technical. Difficult to share the knowledge among non-technical people. It could be a solution to spread this knowledge on non-technical words.”

Content	Platform Owner	Requirement 3.1.6: Create an organised and easy search and filtering system	can study and learn from peers in the same domain
Content	Reviewers	Requirement 3.1.7: Ensure validation of content, future-proofing and scouting of external/global best practices	
Content	Reviewers	Requirement 3.1.8: Follow strong ethical criteria to validate contents before publishing them	high quality and ethical content are finally published
Content	Instructional designer	Requirement 3.1.9: A glossary of AI topics/notions for (PA) dummies	“There is a necessity of knowing exactly what Ai is”
Content	Instructional designer	Requirement 3.1.10: Clear and concise explanations of AI concepts and technologies, tailored to the PA's level of technical expertise	“There is a necessity of knowing exactly what Ai is”. “AI is still really technical. Difficult to share the knowledge among non-technical people. It could be a solution to spread this knowledge on non-technical words.”

Perceived medium relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Content	PA Officials	Requirement 3.1.12 : Submit up-to-date to others' relevant use cases for AI solutions	it will help them to become more efficient by reusing others' impactful AI solutions

Perceived low relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Content	Citizens	Requirement 3.1.13:: Be up-to-date to others' relevant use cases for AI solutions	

Content	Citizens	Requirement 3.1.14: Validate strong ethical criteria to validate contents before publishing them	so that the quality is ensured
Content	Platform Owner	Requirements 3.1.15: Share recorded videos from AI solution developers	
Content	Platform Owner	Requirements 3.1.16: Clusters of similar public sectors implementations.	

10.2.4.4.4.2 Contacts

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived high relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Contacts	PA Officials	Requirement 3.2.1: Implement some communication strategy to share what uploaded and create an AI community	
Contacts	Platform Owner	Requirement 3.2.2: Develop some communication strategy to share what uploaded and create an AI community	“People sharing experiences, giving coaching, lectures with real hands on or hackathons using AI. it is important because it may save you more time that those that you will spend in organise these activities”
Contacts	Platform Owner	Requirement 3.2.3: Collect suppliers’ proposals and evaluate them to later include in AI-on-Demand platform	

Perceived medium relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes

Contacts	Platform Owner	Requirement 3.2.4: Database of suppliers of AI providers	Legacy applications, when it is time to update/replace them, it is necessary to look for market solutions. The assessment needs to be made. There are a lot of solutions that deal with the areas that they handle (HR) but the costs are important when making those decisions. Interesting - but who takes responsibility for the claims made by providers. It could be used by the providers for marketing purposes.
Contacts	Platform Owner	Requirement 3.2.5: Creating bridges among different PA Stakeholders	

Perceived low relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Contacts	Citizens	Requirement 3.2.6: Have a strong feeling of a belonging to a big AI Community	

10.2.4.4.4.3 Technical tools

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived high relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Technical Tools	Instructional designer	Requirement 3.3.1: A sandbox for interactive case studies in a controlled simulated environment.	“There is a lack of technical knowledge among the PA Officials”

Technical Tools	Platform Owner	Requirement 3.3.2: Design a strong backend to let PAs be able to upload use cases / contents.	“Good and Bad Use Cases are the key to understanding how to apply AI to different public services.”
Technical Tools	Platform Owner	Requirement 3.3.3: Tools and resources for accurate content identification, filtering, real-time change detection, and visualising patterns.	In order to provide knowledge with the information we understand that the use cases should be well structured and organised so that they could easily be reused.
Technical Tools	Platform Owner	Requirement 3.3.4: Create an organised and easy search and filtering system.	“Search and reuse should be simple and easy”
Technical Tools	Platform Owner	Requirement 3.3.5: Create a repository of tested, transferable and scalable AI solutions.	The idea of creating a repository of Valuable AI Solutions was a key concept from all the interviews.
Technical Tools	Platform Owner	Requirement 3.3.6: Create a centralised AI platform accessible by all stakeholders	“We should have an interoperable and easy access to all the information.”

Perceived medium relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Technical Tools	Platform Owner	Requirement 3.3.7: Design a strong backend so the validator is able to review the content and publish only the high-quality ones	“It is difficult to establish what a good or bad content is regarding the quality”.
Technical Tools	Platform Owner	Requirement 3.3.8: A chat(bot)/ functional mailbox for direct contact with support on procurement.	We perceived a need of having direct answers to specific issues that PAs might have.

Perceived low relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes

Technical Tools	Platform Owner	Requirement 3.3.9: Design a strong backend to create a voting structure for the community to decide which contents are more relevant	“Even though it could be a good approach, users might not easily vote for the contents, so it might be difficult to implement.”

10.2.4.4.4.4 Data

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived high relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Data	Platform Owner	Requirement 3.4.1: Create a repository of downloadable AI resources like uses cases and experience sharing that are easily accessible to users	"We don't manage any data” The ministry doesn't have any technical collaboration with other organisations."
Data	Platform Owner	Requirement 3.4.2: Create a repository of tested, transferable and scalable AI solutions	"All resources are outsourced and will be bought by public procurement if needed."

10.2.4.4.4.5 Training

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived high relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Training	Platform Owner	Requirements 3.5.1: Facilitation of knowledge sharing on AI trends and opportunities among PA stakeholders	

Training	Platform Owner	Requirements 3.5.2: To ensure that PA employees are equipped to effectively acquire and use AI solutions in their work	One of the key challenges: workforce readiness Skills – how to implement and run the technology in the infrastructure, this is not easy. This has a high price. Those profiles are sought also by the market. Direct competition with the private sector.
Training	Instructional designer	Requirements 3.5.3: Create a catalogue of courses clustered by topics. E.g., Courses on how to procure AI, on how to develop AI, on integrating AI into PA workflow and processes, on how to make business cases for tech-dependent solutions.	

10.2.4.4.4.6 Services (offered by providers)

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived high relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Services (offered by providers)	PA official	Requirement 3.6.1: Provide a list of guidelines for ethical and responsible AI use that are followed throughout development, deployment, and maintenance. Encourage responsible AI practices/contents	Ensure that AI algorithms do not discriminate against individuals or groups based on their race, gender, religion, age, disability, or any other protected characteristic. Monitor the data used to train the AI system for any biases and take steps to correct them.
Services (offered by providers)	Platform Owner	Requirement 3.6.2: Match service to put together PAs that could benefit from each other's experiences and solutions	Putting similar organisations (i.e., international with similar structure) could help in

			sharing knowledge and communicate
Services (offered by providers)	Platform Owner	Requirement 3.6.3: Provide a tailored AI advisory service to the PA	

10.2.4.4.4.7 Events

Administrative levels covered:

- European level (EU27)
- National level (Slovenia)

Perceived medium relevance

Cluster / category	Type of stakeholder	Requirement	Insights / quotes
Events	Platform owners	Requirement 3.6.4: Organising dedicated sessions/webinars with the top-rated AI use cases to spread it further	Importance of bringing together community for events and for knowledge sharing activities on AI enablers, barriers, and opportunities

10.2.4.5 Joint group 4

10.2.4.5.1 Introduction

The AI-on-Demand platform is an international collaboration aiming to reduce weakness and empower strength for AI in Europe. The platform aims to:

“Mobilise the entire European AI community to make AI promises real for the European Society and Economy, Support the European R&D, Create a leading collaborative AI European platform to nurture economic growth, and Foster innovation and tech transfer”.

In order to ensure that the AI-on-Demand platform fulfils its aim, the team was tasked to perform a gap analysis between the offerings of the platform and the needs of Public Sector employees. This report is a summary of the findings of the team.

10.2.4.5.2 Methodology

A structured approach to gather needs and requirements

In order to map the needs and requirements of the AI-on-Demand platform to suit public sector workers, the task was approached in a structured way to ensure the gap analysis would be as thorough as possible. The approach included an initial planning stage, followed by stakeholder interviews, which was used to develop user stories and requirements, and later validated in a co-creation session.

The work began with a Service Safari and Sensemaking activity to gather the team impressions and previous experiences with the topic. The Service Safari provided initial impressions of the AI-on-Demand platform by the team members to discover the platform as-is. The Sensemaking activity collated the individual initial impressions with the team's own understanding of the needs the platform tries to fulfil as well as experience working with AI projects transnationally.

The initial activities were followed by a mapping of relevant stakeholders to identify key stakeholders and develop structured interview questions to gather insights into the problem framing. From the mapping of stakeholders, the team identified potential candidates in personal networks to interview for feedback on the platform, as well as an assessment of the teams' assumptions on the stakeholder needs to prepare questions for a stakeholder interview. A series of interview questions were prepared to ensure answers to the most important assumptions from the team. On the basis of the interview questions, a structured interview was conducted (see profile in following section).

The insights from the interviews were extracted and ordered to further focus the problem space. Several important barriers to AI adoption were highlighted by the interviewees, which was used to reframe the problem statement of the team by focusing on the interviewee's experiences of frustration working in a very static organisation.

Afterwards, the insights, combined with the reframing, were rephrased into user stories, from which potential requirements were extracted to be validated at a user co-creation session. The user stories and requirements collected by two teams were combined. The groups were made based on overlap in problem statements and done to add fresh perspectives and to plan activities for the co-creation session. The co-creation session took place at the AI4GOV Public Event in Nuremberg, March 2023, where several experts in AI for Public Sector provided invaluable feedback on the user stories and requirements.

Finally, the inputs from the co-creation session were added to the user stories and requirements to produce the final requirements presented in this report below.

10.2.4.5.2.1 The stakeholder interview profiles

A large part of this project involved interviewing key stakeholders to gather insights to the problem frame and provide the most accurate needs and requirements for the AI-on-Demand platform.

"The Head of IT"

The first key stakeholder the team interviewed is a head of the IT division in a major ministry in Montenegro. The stakeholder has a background in Engineering and they have several decades of experience working in the public sector on different levels. Based on the interview, the institution where the stakeholder works has little focus on AI at present moment, since the momentum for AI efforts are not sufficient as of today.

The organisation is wary of change and many processes are still very paper based. The biggest challenges to implementation of AI solutions are not directly related to infrastructure, as this can be procured with a proper use case, but rather the lack of excitement and drive to implement AI solutions within the organisation. Therefore, the biggest need highlighted by the stakeholder was access to results from previous AI implementation efforts in other European countries as well as information on the non-technical skills essential to implementing AI projects in large organisations.

"The Professional in the Market Monitoring"

The second interviewee works in the Market Monitoring and Regulation Unit at the Chilean Ministry of Energy as a professional. Their organization's main goals are to reach an agreement with the industry to move towards decarbonization, reduce energy poverty, improve service quality, and increase resistance to natural disasters. To tackle the first two challenges, they employ AI tools such as renewable energy potential explorers and Power BI for regulatory analysis. The interviewee is keen on networking with other public administrations and researchers to share best practices on developing and utilizing AI solutions. Currently, the organisation faces infrastructure challenges, including limited licences for tools like Power BI and insufficient servers for their daily tasks. These challenges limit their capability of implementing AI solutions. The organisation provides both group and individual training, and the interviewee is familiar with AI's benefits and limitations. However, they would still appreciate having a centralized repository to exchange information. The interviewee acknowledges the GDPR but notes that it is not used in Chile. Instead, the organisation complies with the "National Cybersecurity and Data Security Strategy," which every public administration should know.

1.2.3. “The Head of Digital Tourism Ecosystem”

The third interviewee is a Head of Unit at the Italian Ministry of Tourism, with responsibility for the implementation of the national digital tourism ecosystem. The Ministry is very young, as it was founded less than 2 years ago. Its staff does not have substantial IT skills. In terms of AI maturity, the Ministry can be considered to be still in its infancy: at present, there is no AI strategy, there are no specific AI competences, and there is no organizational unit within the Ministry devoted to AI.

To this day, two proprietary AI solutions were purchased from providers: (i) One is a solution for AI-powered translations, to be then checked by humans for publication online. The solution is fully operational as it has been purchased as ready-to-use; and (ii) one is a chatbot support for tourists. As in the previous case, the solution is fully operational as it has been purchased as ready-to-use.

The Ministry is also currently exploring the possibility of purchasing from OpenAI a solution to research external data sources. A number of demos have been tested and very positively considered.

In a view to support a greater uptake of AI in the Ministry, the interviewee was particularly interested in having access to use cases and good practices from similar administrations.

10.2.4.5.3 User stories

The developed user stories are presented below. Based on the planning work described in the methodology section, the team decided on the following need statement to guide the User Story development:

“How might we provide complementary knowledge for public servants to drive change in their organisations and increase public trust in AI services?”

This statement was the overarching question the team set out to validate during the co-creation session. Each user story is divided into the following parts: The user story as a one sentence statement, a short explanation of the relevance, as well as the proposed requirements. Each requirement has the added feedback in the form of notes, M indicates Must-have, N indicates Nice-to-have and U indicates Unnecessary. Furthermore, any additional feedback from the co-creation session in Nuremberg is also added.

User Story 1: A Public Administration manager should be able to open the space for the experimentation so that he/she can allow others / colleagues to fail while experimenting.

RELEVANCE:

One important part of the innovation process is the possibility to learn from failures. This means that making mistakes should be possible and not cause harm, so special environments must be set up and the manager should encourage the staff to use this possibility to learn and he/she should act by example.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- Space for innovation is secured within Public Administration
- Office for innovation is set
- Inspiring cases are secured
- There needs to be a secure and GDPR-compliant sandbox environment to experiment with internal data and AI-based solutions

User Story 2: A public servant should know and understand the opportunities offered by AI so that he/she can decide when and where to adopt it.

RELEVANCE:

In order to make the right decisions about what kind of technology is needed and to be able estimate the offers from external service providers the public sector needs to have internal competences on AI technologies – at least basic ones.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- Case studies of successful AI applications
- Guidelines to understand if a given solution is fit or unfit ("this is for you, this is not for you so see this other solutions") and description/categorization of services offered by the public administration (especially including those that could be optimized through an AI solution)
- Trustworthy knowledge base of AI applications

ADDITIONAL ACCEPTANCE CRITERIA /REQUIREMENTS FROM THE EVALUATION SESSION IN NUREMBERG:

- "Walk through" – a step by step guide
- Templates of tender documentation

User Story 3: A public servant should be able to manage data so that he/she can make use of AI solutions.

RELEVANCE:

In order to implement AI technologies data and skills on data management are needed.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- Training on data management
- Case studies on data management (and how data was then fed into AI solutions)
- Information on data taxonomies

ADDITIONAL ACCEPTANCE CRITERIA /REQUIREMENTS FROM THE EVALUATION SESSION IN NUREMBERG:

- Training on interoperability standards available at EU level (connection with joinup)
- Reference to existing resources

User Story 4:

A public servant should be able to play around with Artificial Intelligence so that he/she can learn from his/her mistakes in a safe way.

RELEVANCE:

One important part of the innovation process is the possibility to learn from failures. This means that making mistakes should be possible and not cause harm.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- A secure AI playground that can be integrated with real data
- 5+ guided tutorials that simulate the implementation of real case studies for each level of government

User Story 5:

A Public Administration manager should be able to lead by example so that they can motivate other team members & inspire colleagues.

RELEVANCE:

People who want to foster AI management need to be able to drive the change without relying on external people and resources for the initial stages of testing and piloting new initiatives.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- 4+ change management techniques for each level of government are provided
- 5+ positive case studies for each level of government are provided
- 5+ negative case studies for each level of government are provided

User Story 6:

A public servant should be able to explore existing AI solutions represented in BPMN so that he/she can explain the rationale of AI to the public.

RELEVANCE:

Business Process Management Notation (BPMN) is a standardized graphical representation for business process modelling and could be used as a standardized possibility to evaluate the value or the impact of the AI technology in existing business processes (e.g., actual-target analysis). Through visualization the solution can be better understood by public servants, but also by the public.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- Driving technical change without being technical
- Valuable "plug-and-play" content M
- Case-studies should be documented with reference to:
- data availability
- algorithm availability
- ethical considerations
- solution maintenance
- interoperability check traffic light
- ownership considerations

ADDITIONAL ACCEPTANCE CRITERIA /REQUIREMENTS FROM THE EVALUATION SESSION IN NUREMBERG:

- Costs
- Tendering procedure

User Story 7: A researcher should be able to extract structured data about case studies so that they can be used for research purposes.

RELEVANCE:

Public sector institutions can benefit from the research work done through a platform like AI-on-Demand only through collaboration and sharing of results and data.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- Case studies should be documented with a standard business model notation
- The notation should be easily extracted via API. Easy is defined as conforming with a general, widely accepted standard, the specific standard to be determined.

ADDITIONAL USER STORIES, WHICH WERE WRITTEN DURING THE EVALUATION SESSION IN NUREMBERG

- The following user stories were suggested by the participants during the co-creation session and deemed to be of high importance for the overarching need statement (from section 10.2.4.5.2) to be fulfilled. Since the relevancy is deemed by the mentioning of the user stories by the participants, and not further developed after the fact, they are presented here in their current state.

User Story 8: A public servant should know what funding is available so that he/she can implement AI

User Story 9: A public servant should be able to evaluate the financial cost of an AI solution so that he/she can plan and justify the costs of an AI project.

ACCEPTANCE CRITERIA /REQUIREMENTS:

- Simulation tool from benchmarking
- Case studies should have a mandatory field explaining how much AI costs.
- Ways of funding
- Costs could be represented in different ways.

User Story 10: A public servant should be able to ensure the respect of privacy regulation so that citizens' personal data is well protected.

10.2.4.5.4 Requirements

Below, the requirements mentioned above are clustered by overarching categories and ordered by importance. Requirements that fall within several categories are mentioned several times for the reader's convenience. Requirements that were deemed unnecessary were not added to the summaries below.

10.2.4.5.4.1 Content

Content was deemed very important by the participants in the co-creation session. Every participant stressed the importance and value of content that helps deliver AI projects in a structured manner. Tools like guidelines and templates were stressed as being especially sought after, since high-level abstract descriptions are abundant, but the practical step-by-steps are difficult to find. Below are the evaluated requirements that the team developed ranked by importance:

- **Must haves:**
  - Guidelines to understand if a given solution is fit or unfit ("this is for you, this is not for you so see this other solutions") and description/categorization of services offered by the public administration (especially including those that could be optimized through an AI solution)
  - "Walk through" – a step by step guide
  - Templates of tender documentation
  - Reference to existing resources
  - Valuable "plug-and-play" content
  - Case studies should have a mandatory field explaining how much AI costs.
  - Costs could be represented in different ways.
- **Nice to have:**
  - Case-studies should be documented with reference to:
  - data availability
  - algorithm availability
  - ethical considerations
  - solution maintenance
  - interoperability check traffic light
  - ownership considerations
  - Case studies on data management (and how data was then fed into AI solutions)
  - Information on data taxonomies
  - Trustworthy knowledge base of AI applications
  - Case studies of successful AI applications

10.2.4.5.4.2 Technical tools

Technical tools were deemed important by participants, but mainly from an experimentation angle. The participants were all highly skilled in AI model development, so ways of testing the models in a low-risk environment with somewhat real data were deemed very attractive.

One participant mentioned that it is paramount to be able to test in a GDPR compliant sandbox, as they often do not know exactly what type of model they are looking to implement, and they want to avoid the risks of running their algorithms on "real data in real life".

Below are the evaluated requirements that the team developed ranked by importance:

- **Must haves:**
  - Simulation tool from benchmarking
  - 5+ guided tutorials that simulate the implementation of real case studies for each level of government
  - There needs to be a secure and GDPR-compliant sandbox environment to experiment with internal data and AI-based solutions
  - A secure AI playground that can be integrated with real data

10.2.4.5.4.3 Data

The participants agreed that sharing of data from the public sector tended to be infeasible due to the many legislative and bureaucratic bodies governing ownership and rights to data. One participant mentioned that "*while it would be lovely to have access to other organisations data, [they] highly doubt they would even be allowed to look at it".*

However, the general understanding of data management and data governance was deemed interesting by several participants. Furthermore, the need for low-risk experimentation platforms was highlighted again due to the nature of the data being processed. Below are the evaluated requirements that the team developed ranked by importance:

- **Must haves:**
  - There needs to be a secure and GDPR-compliant sandbox environment to experiment with internal data and AI-based solutions
  - Training on data management
  - Case studies on data management (and how data was then fed into AI solutions)
  - Information on data taxonomies

10.2.4.5.4.4 Training

Training was one of the points that the team was very interested in validating, based on the initial interviews. The participants at the co-creation session agreed on the usefulness but were sceptical of the actual provided value compared to the cost of developing, maintaining, and offering such types of training. Since the participants were already highly skilled in methods for implementing AI in the public sector, the types of training they were most interested in were about data management, interoperability, cost estimation and tender procedures. Below are the evaluated requirements that the team developed ranked by importance:

- **Must haves:**
  - Training on data management
  - Training on interoperability standards available at EU level (connection with joinup)
  - Training on cost estimation
  - Tendering procedure

10.2.4.5.4.5 Services (offered by providers)

Since the participants are all working in the public sector, there is already an abundance of service providers looking to sell knowledge and access to AI solutions. Therefore, in order for the AI-on-Demand platform to provide unique value, the participants stressed the ability to experiment in a low-risk environment for both the individual AI models, but also the entire implementation process of an AI solution. Below are the evaluated requirements that the team developed ranked by importance:

- **Must haves:**
  - 5+ guided tutorials that simulate the implementation of real case studies for each level of government
  - There needs to be a secure and GDPR-compliant sandbox environment to experiment with internal data and AI-based solutions
  - A secure AI playground that can be integrated with real data
  - Simulation tool from benchmarking
- **Nice to have:**
  - Space for innovation is secured within Public Administration.
  - Office for innovation is set

- Inspiring cases are secured

10.2.4.5.4.6 Funding programs

While the point of funding was not touched upon a lot during the co-creation session, all participants agreed that more funding, especially for the parts of AI solution implementation that is most important for a platform like AI-on-Demand, namely collection and sharing of the outcomes of AI-projects, would be highly valuable. A funding program to ensure resources so that this information and the lessons learned from implementing AI solutions in the public sector can benefit other institutions would be used by all the participants. Below are the evaluated requirements that the team developed ranked by importance:

- **Must have:**
  - Ways of funding

10.2.4.6 Conclusion & Wrap-up

The aim of the project work was to perform a gap analysis of the offerings of the AI-on-Demand platform compared to the needs of public sector workers. An interview guide was developed based on the initial understanding of the problem, and the guide was used to interview several key stakeholders. The results of the stakeholder interviews were used to develop concrete user stories and requirements to fulfil the needs of the key stakeholders. The requirements were validated and updated based on feedback from expert participants during a co-creation session. The final requirements were then clustered and presented in this report.

The outcomes of the project work proposed suggestions to further add valuable topics to the AI-on-Demand platform not currently covered. Adding these topics would support public sector workers when implementing AI solutions in their institutions more efficiently with lower risk.

While the feasibility and cost estimation of implementing the proposed features were outside the scope of this project, the expected value of providing complementary knowledge for public servants to drive change in their organisations and increase public trust in AI services was echoed by all interviewees and participants of the co-creation session. A further feasibility study into the scope of implementing such changes is recommended by the team before adding the requirements to the AI-on-Demand platform development roadmap.

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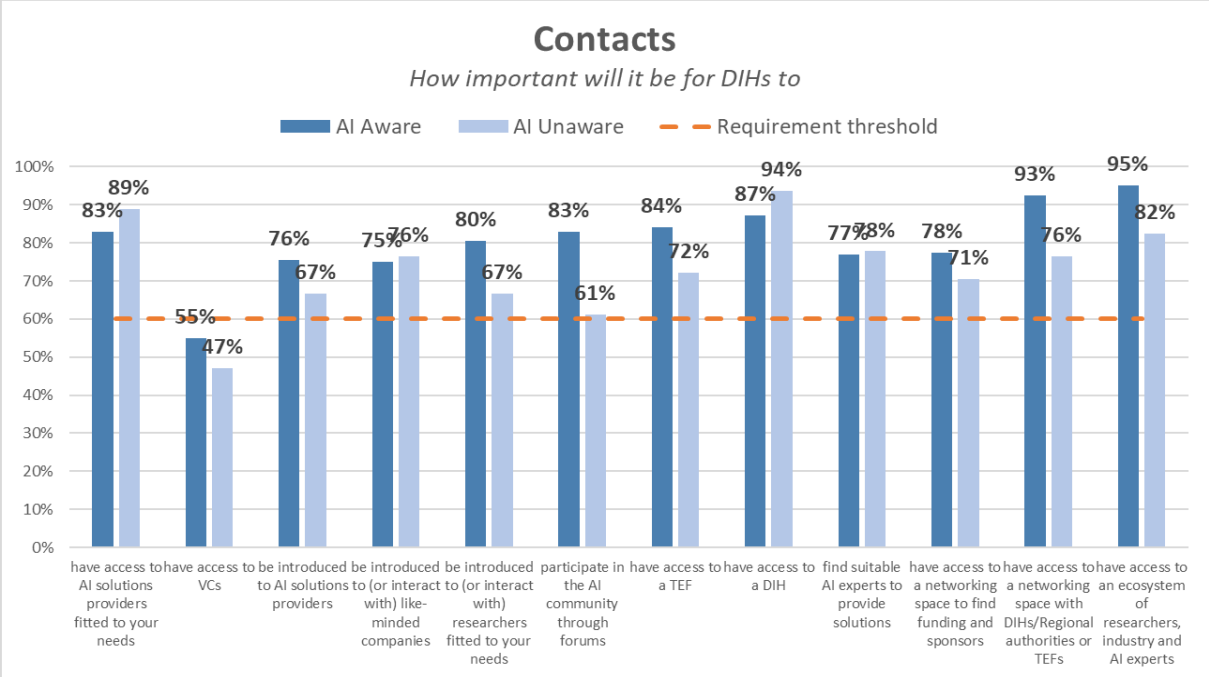
Project deliverables

- ICF, Carsa, Wavestone (2023) Study for the Adopt AI Programme: Final study report
- AI4GOV Master on Artificial Intelligence for Public Services (https://ai4gov-master.eu/)
- D2.1 - Landscape Mapping - v2.3
- D2.2 - Report on Community and engagement activities - rev2
- D2.3 - DT4REGIONS Platform Design - rev0.2.docx
- DT4Regions and Living-in.EU Capacity Building Survey Short Report
- Public buyers community (https://public-buyers-community.ec.europa.eu/about/participation)
- D3.1 Report on methodology (Govtech Connect)
- Sandboxing. How to use it to strengthen your local data ecosystem (https://publications.jrc.ec.europa.eu/repository/handle/JRC130555)

10.3 DIHs and TEFs

10.3.1 Requirements – DIHs

10.3.1.1 Contacts



Most of the respondents are interested in getting connections with other DIHs and having access to a networking space. Responses from AI aware and AI unaware differ mainly in the higher interest of AI aware DIHs to be introduced to researchers and TEFs. Whereas AI unaware DIHs show more interest in having access to AI solution providers. Both groups agree that the connection with Venture Capitalists is not a relevant feature to them.

It is interesting to notice that (E)DIHs are relying on the AIoD platform to offer them access to the ecosystem, mainly to other (E)DIHs, Regional authorities, TEFs and AI experts.

“

Connect with local institutions who are involved in AI policy implementation to cooperate with them in promoting that solution.

”

Sylwia Stefaniak,

Project Manager *at* Mazovia EDIH - Poland

Mazovia EDIH

“

Access to a list of AI experts to be onboarded in EDIH projects.

”

Cristina Baghiu,

Hub Coordinator & Digital

Innovation Manager at Digital Innovation Zone-Romania:

“

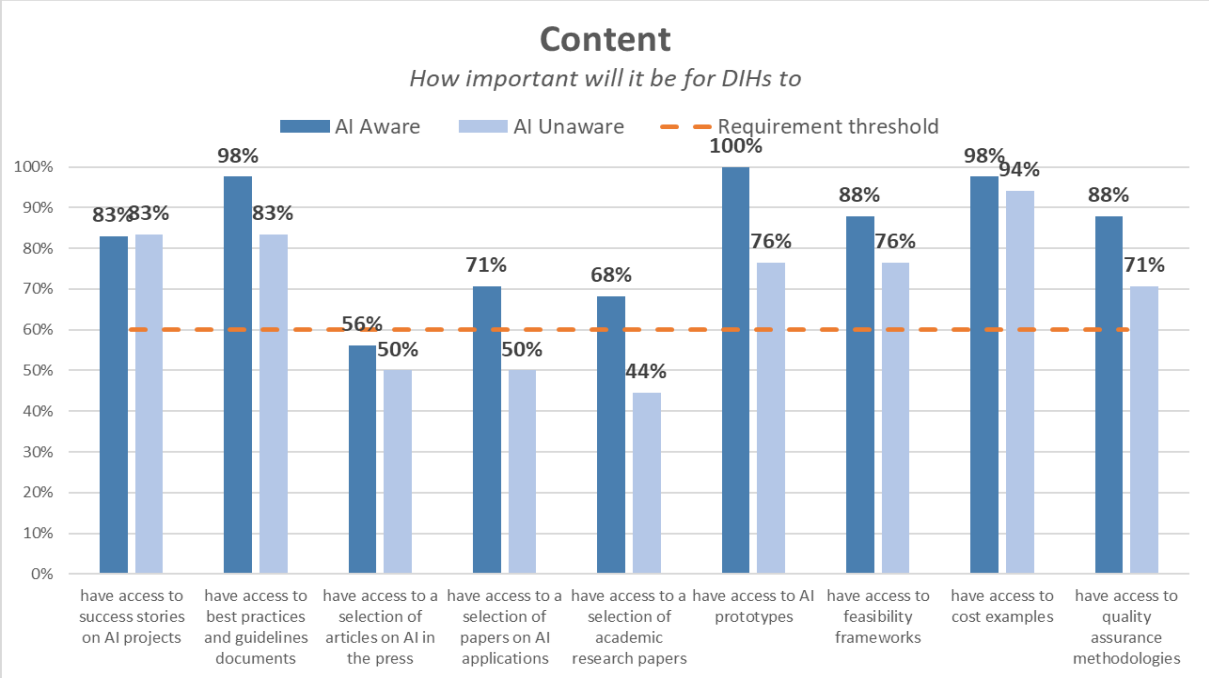
Our EDIH is very much interested in finding new collaboration opportunities with other EDIHs. A platform that allows the co-creation of joint projects or execution of joint services in the area of AI, with a matchmaking feature would be very useful.

”

Hartmunt Huebner,

Managing Director at digihub.li - Liechtenstein

10.3.1.2 Content



Both (E)DIHs categories are highly interested in having access to cost examples of the adoption of AI, followed by best practices and guidelines documents. Having access to best practices is considered very relevant by AI aware and unaware (E)DIHs. As expected, AI aware DIHs are more interested in having access to AI prototypes and quality assurance methodologies. The access to articles in common press does not seem a priority for both groups of hubs.

Offering (E)DIHs real examples on how they can make use of the available resources and learn from others is key priority for the surveyed hubs.

“

Show EDIHs/TEFs specific paths how SMEs can use the AIoD platform (creating manuals/records).

Also, create one dissemination toolkit adapted to each of the European countries, with local examples, to facilitate the use of the available resources in the AIoD platform by EDIHs.

”

Sylwia Stefaniak,

Project Manager *at* Mazovia - Poland

Mazovia EDIH

“

Focus on user-friendly exploitation that does not require a lot of overhead (providing guidelines).

On the other hand, share best practices on how AIoD platform created added value for specific SME/DIH.

”

Kosta Jovanovic,

Project Manager at ETF Robotics - Serbia:

“

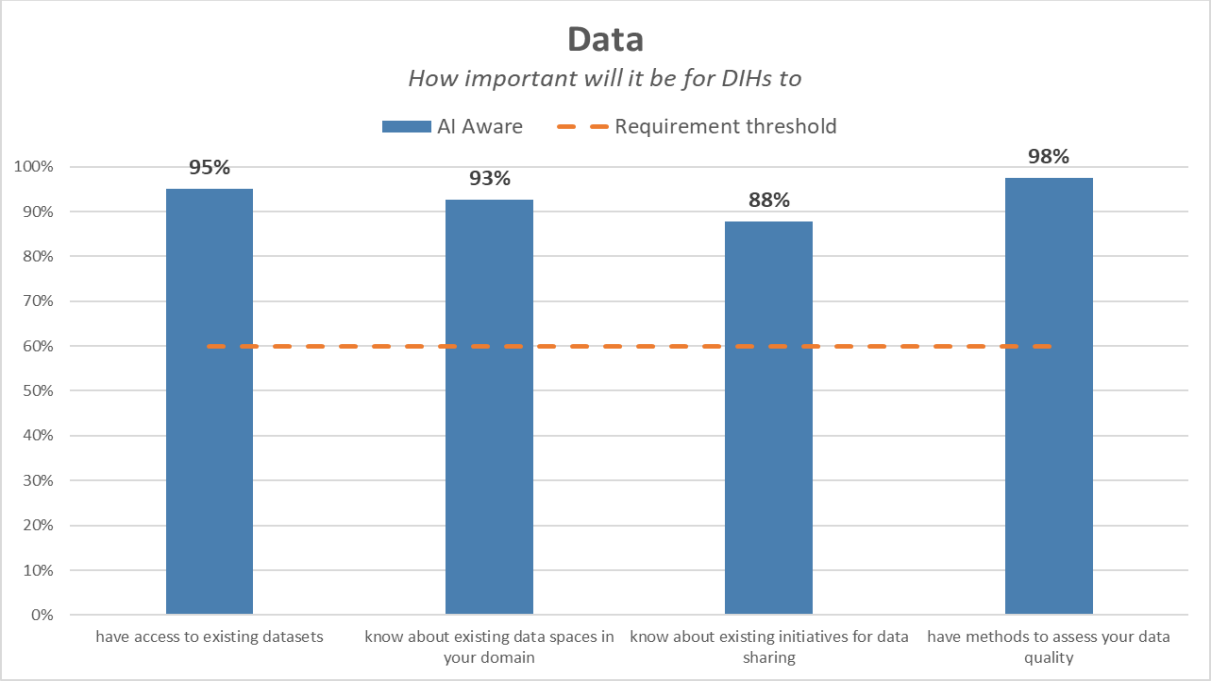
Guidelines and best practices regarding AI solutions provision to SMEs and public organisations, as well w.r.t. legal, ethics and trustworthiness.

”

Denia Kanellopoulou,

AI Innovation Expert at ahedd DIH - Greece:

10.3.1.3 Data



AI aware DIHs show the need for improving the access to datasets, data spaces and initiatives for data sharing, identifying the methods to assess internal data as the most important one.

European projects and associations currently working around data should be invited to contribute to the platform with lessons learned and resources. This would also allow to leverage on other EU initiatives results and facilitate its exploitation by (E)DIHs.

“

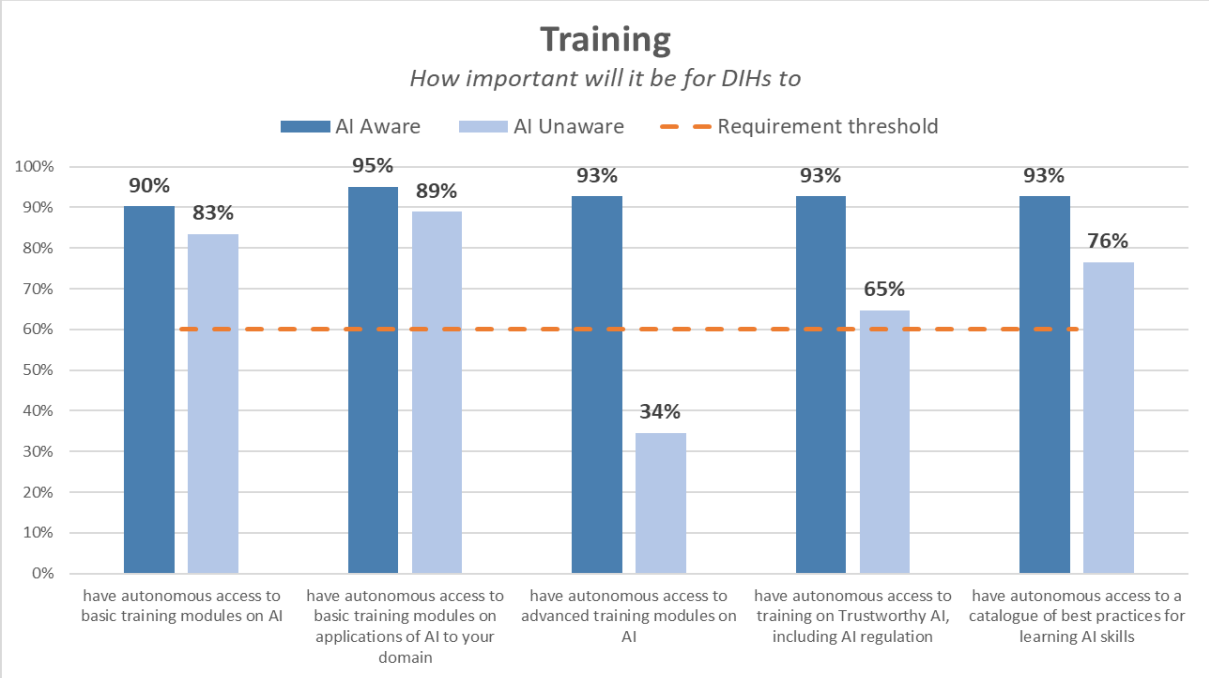
Data to optimize AI models is very relevant, however, the industry might be reluctant to share its own data to this end. Providing data that helps transition from a theoretical model to a real-world model should be considered a key priority.

”

Laura Diosan,

Professor at Bayes Babes-Bolyai University, partner responsible for AI & ML within Transilvania EDIH.

10.3.1.4 Training



The majority of the respondents are interested in receiving some sort of training, as one would expect being the AI aware DIHs the most interested in advanced training modules on AI and on Trustworthy AI.

Most of the interviewed (E)DIHs stated that currently, they lack the knowledge on how to use the platform and make use of the available resources. The activity of providing a train-the-trainers toolkit foreseen in WP5 is totally in line with this need.

“

Technological & training support for EDIHs to offer consulting & AI feasibility for SMEs.

”

Cristina Baghiu,

Hub Coordinator & Digital

Innovation Manager at Digital Innovation Zone-Romania:

“

Training in the use of the platform is needed, DIHs might not be aware of how to use it and lose the chance to be updated with the latest technologies. For this, SMEs and DIHs should be involved to help co-design applied and targeted pieces of training to use the AIoD platform.

”

Laura Diosan,

Professor at Bayes Babes-Bolyai University, partner responsible for AI & ML within Transilvania EDIH.

“

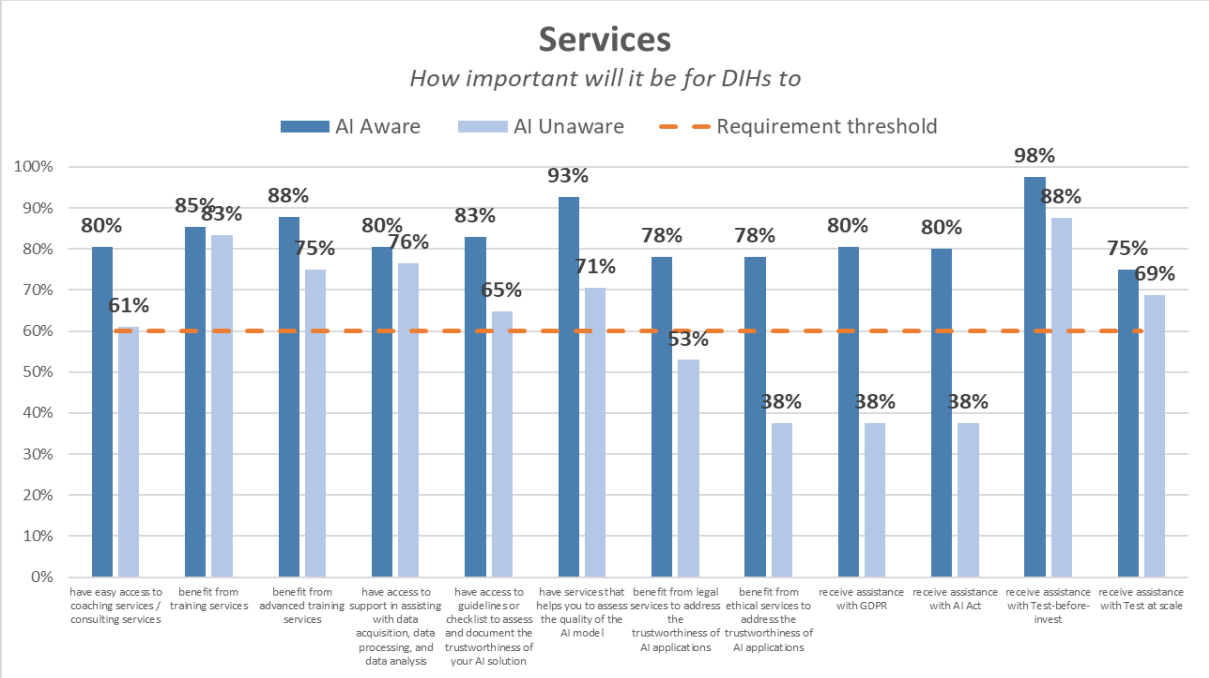
In the area of training, the AIoD platform could become a central repository of AI training offered by EDIHs. Instead of replicating learning platforms in different territories, we could have a unique learning platform on AI at the European level.

”

Hartmunt Huebner,

Managing Director at digihub.li - Liechtenstein

10.3.1.5 Services



Regarding the services AI aware (E)DIHs clearly identify services to receive assistance with Test-before Invest and help in assessing the quality of the AI model as the most interesting. In line with some of the responses mentioned in previous sections, training is equally important for AI aware and unaware, as well as having access to support with data acquisition, data processing and analysis. AI aware (E)DIHs are as well interested in having access to guidelines or checklists to assess and document the trustworthiness' of the AI solutions. Unaware DIHs, due to the lower level of AI expertise, are less interested in legal, trustworthiness and ethical services.

“

The service that we miss in the current AIoD platform is Creating AI implementation roadmap for SMEs.

*On the other hand, i*t is not clearly specified for whom those services are in the context of digital maturity. The available resources should be categorised by the level of AI maturity to make it easier for EDIHs supporting SMEs.

”

Sylwia Stefaniak,

Project Manager *at* Mazovia EDIH - Poland

Mazovia EDIH

“

Find services that would complement EDIHs and TEFs current offerings to their clients. The platform should allow publishing services developed by EDIHs/TEFs for their clients to increase the impact and reusability.

On the other hand, the service that we miss in the current AIoD platform is a Comprehensive catalogue of the offerings and guidelines to encourage and facilitate the adoption.

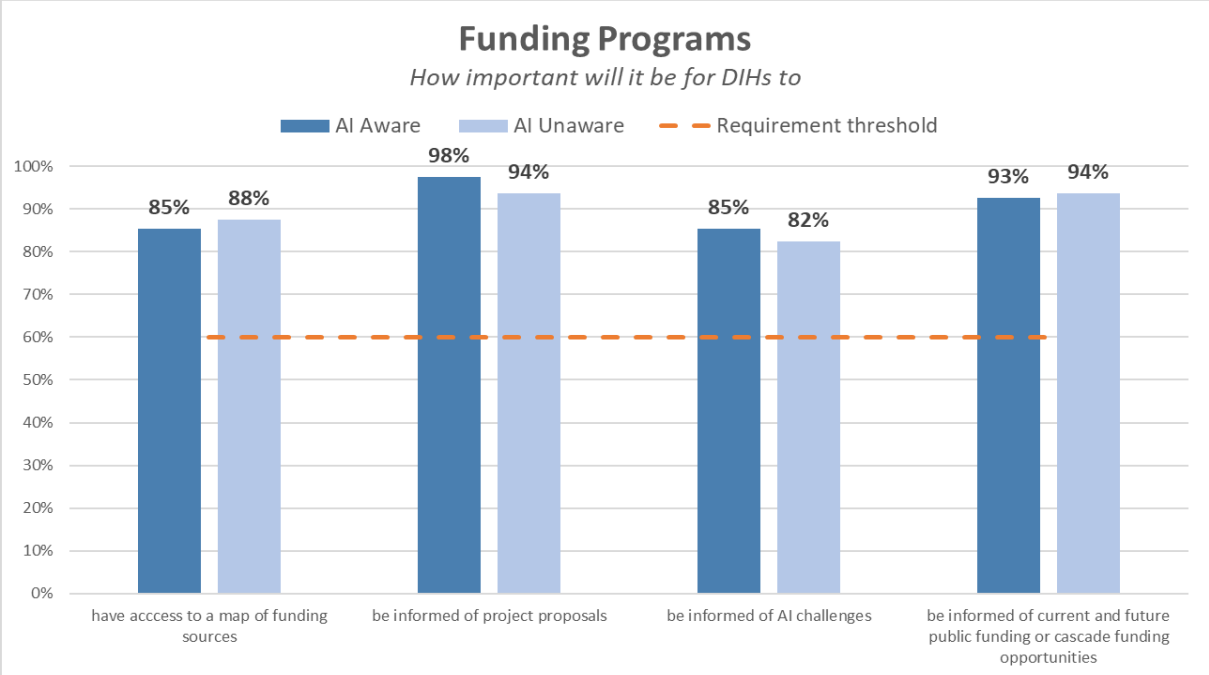
”

Denia Kanellopoulou,

AI Innovation Expert at ahedd DIH - Greece:

ahedd.

10.3.1.6 Funding programs



All (E)DIHs are interested in having access to information on the available funding opportunities, mainly on current and futures public funding, include cascade funds, and to join project consortiums.

“The information about funding programmes to foster AI adoption among SMEs is of course important. However, offering information or best practices how other EDIHs are using blended finance mechanisms to support their companies would be very relevant”

EDIH during the EBN Congress 2023 in Brno, 15th June 2023.

“There are many projects and EU initiatives promoting the use of AI. EDIHs, as brokers of innovation, need to have easy access to clear information on how to support SMEs, not only on the technical level, but also from the financial point of view. Leveraging on the results or examples of existing initiatives would have a big impact on the support offered by EDIHs. Peer learning and knowledge sharing should be promoted, either through the AIoD platform or a Coordination and Support Action”

EDIH during the EBN Congress 2023 in Brno, 15th June 2023.

“

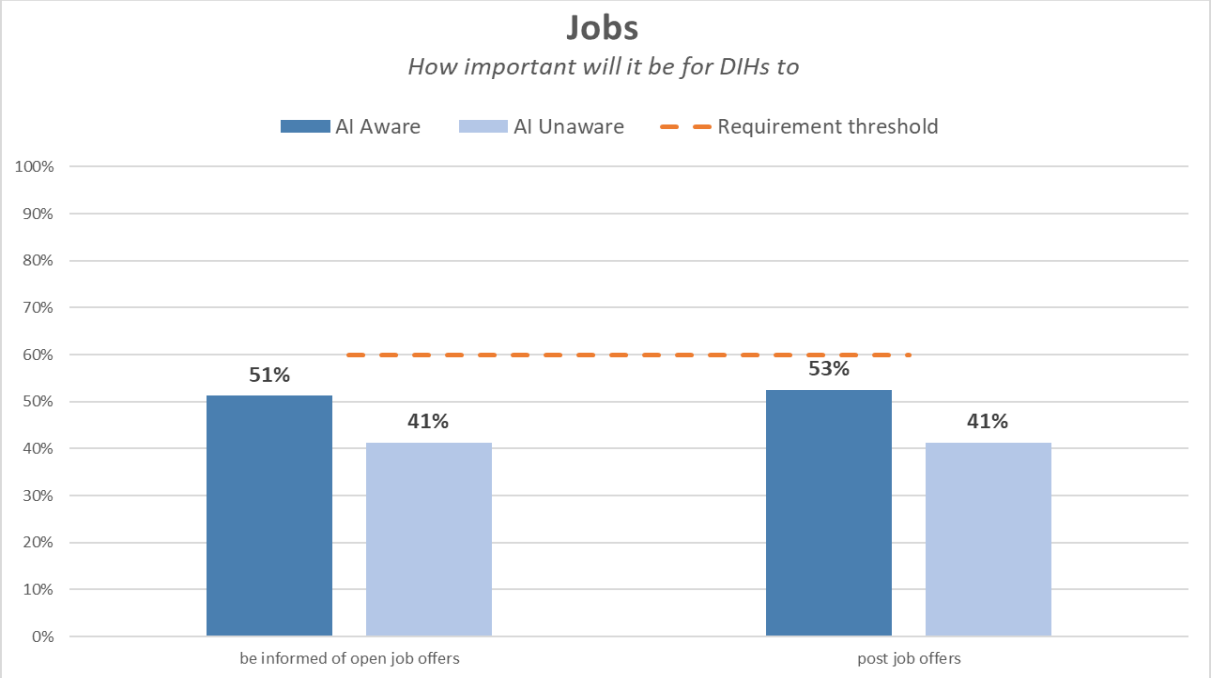
Knowledge of funding opportunities is of big interest to us. However, we are very keen to learn how other EDIHs successfully implemented innovation funding mechanisms to foster AI adoption.

”

Hartmunt Huebner,

Managing Director at digihub.li - Liechtenstein

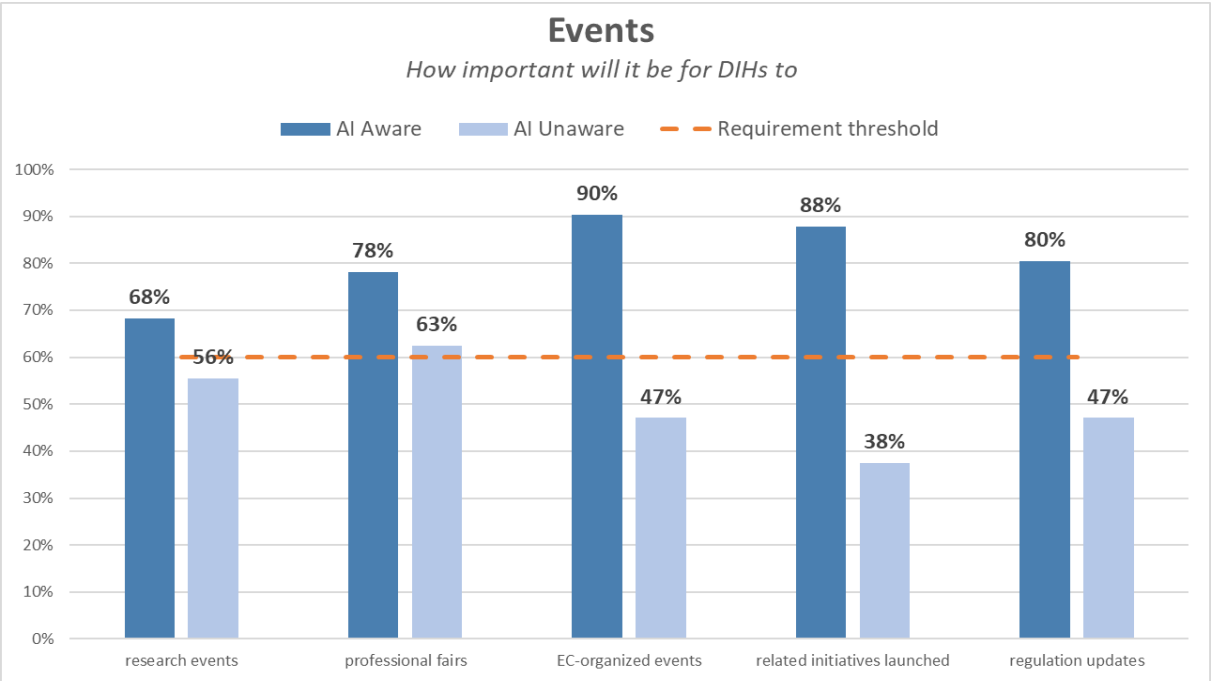
10.3.1.7 Jobs



Both (E)DIHs are less enthusiastic about the idea of receiving job offers information, being the AI aware DIHs, slightly more interested in posting. Here it is relevant to mention the feedback of the EDIHs in Lichtenstein, included in the quote above, where they see this section as an opportunity to create exchange programmes between the staff of different EDIHs. Peer-learning and sharing of best practices is one of the major interests now the (E)DIHs are smoothly activating their operations.

> "In the case of job opportunities, we see this feature as an opportunity to organize secondments between EDIHs in Europe to improve the use of AI tools and foster peer learning opportunities."

10.3.1.8 Events



AI aware respondents are very interested in any type of events related to AI. From EC organized events to other related initiatives and regulation updates, which set requirements on the use of AI. AI unaware (E)DIHs show more interest in professional fairs, for direct access to AI providers and services.

“

Discussion forum where SMEs can talk with AI providers.

”

Sylwia Stefaniak,

Project Manager at Mazovia EDIH - Poland:

Mazovia EDIH

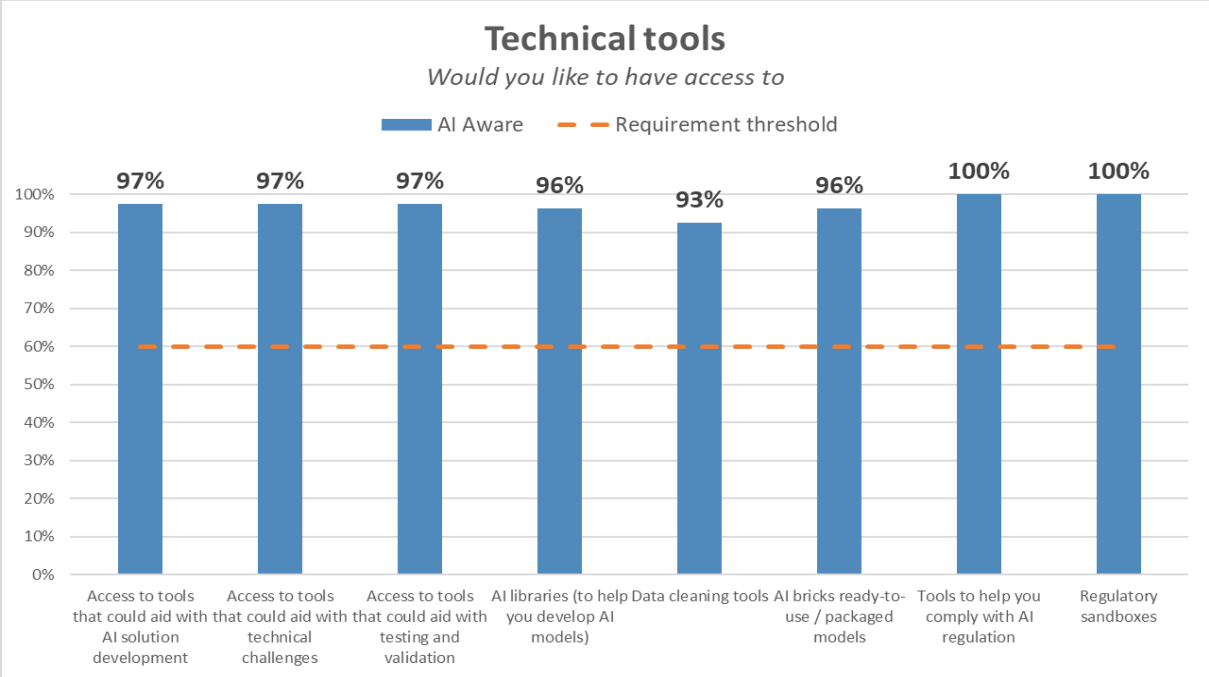
“Co creation workshops with EDIH and local stakeholders will enrich the platform content and take advantage of the available resources.”

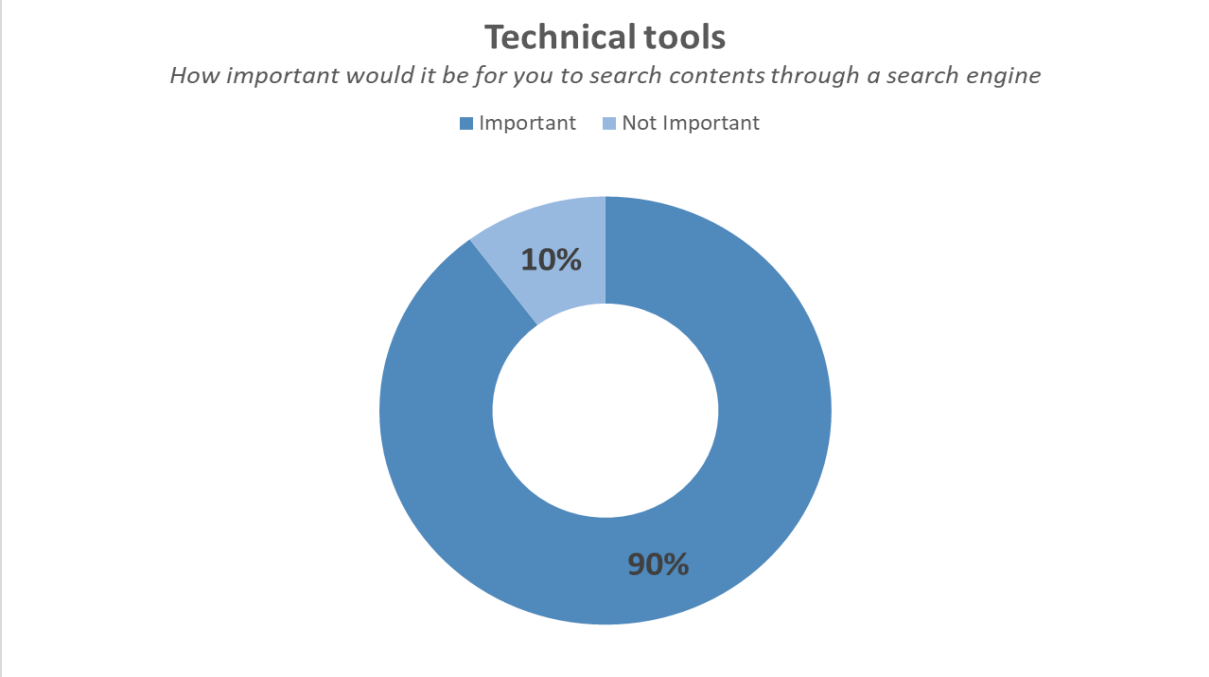
Maria Rossetti, Project Manager at MADE - Competence Center Industria 4.0

MADE Competence Center I4.0

10.3.1.9 Technical tools

Generally, AI aware (E)DIHs are very much interested in any type of technical tools. The main tools they would like to have access to are regulatory sandboxes and support to comply with AI regulation at EU level. These two tools are closely followed by access to AI solutions developments, tools to support in solving technical challenges and testing and validation. Having access to AI libraries to develop AI models or data cleaning tools are as well important to AI aware (E)DIHs. The interest in all these tools is direct, for implementing their own solutions and being able to offer specific services to their customers (SMEs).





Like the responses from the other groups of stakeholders, (E)DIHs expect to find these tools through a search engine. Additionally, during the focus group it was clear that the training on the use of the different tools and potential should be part of the activities of the AIoD platform.

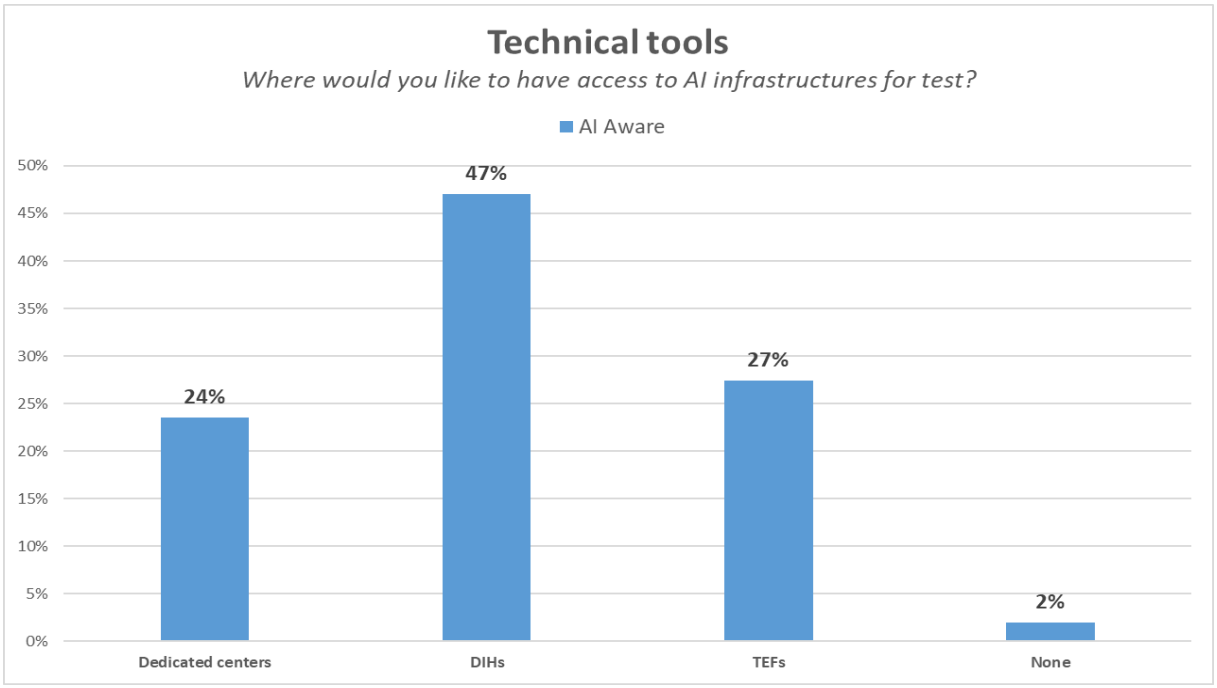
"

We would welcome to receive training on the technical tool and features available that EDIHs members can use to support SMEs.

"

Nancy Tarjenian,

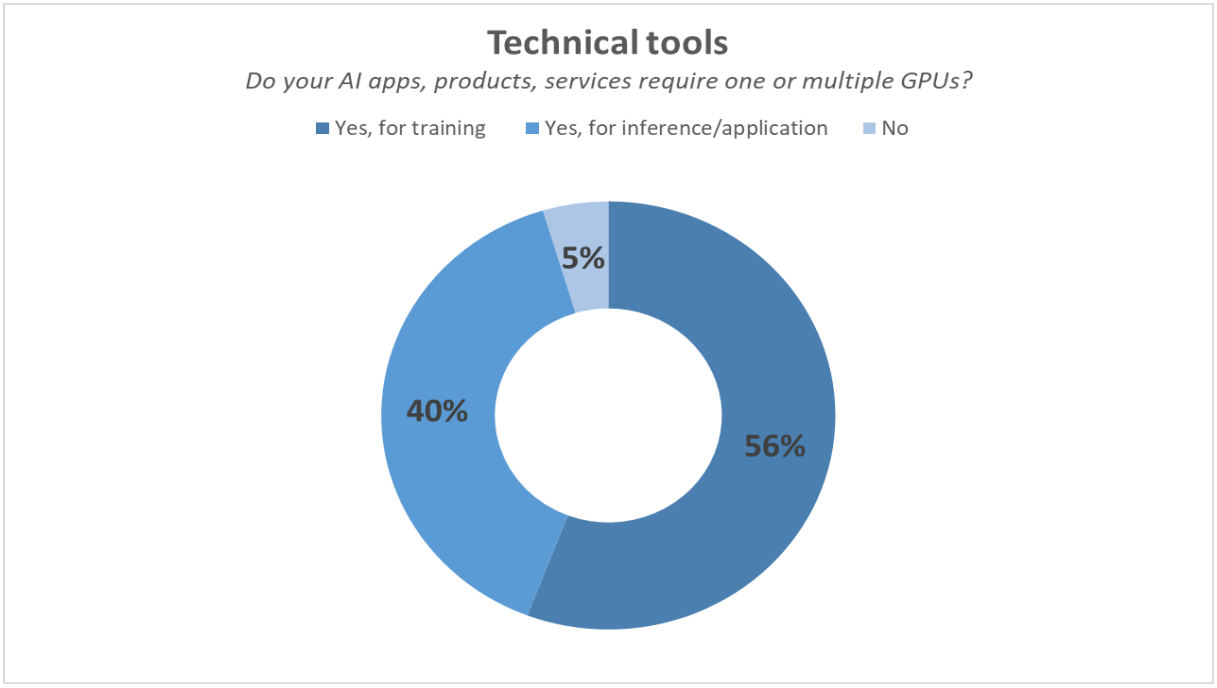
Technological Business Development Europe in AIN Navarra Industrial Association - member of EDIH IRIS, Spain



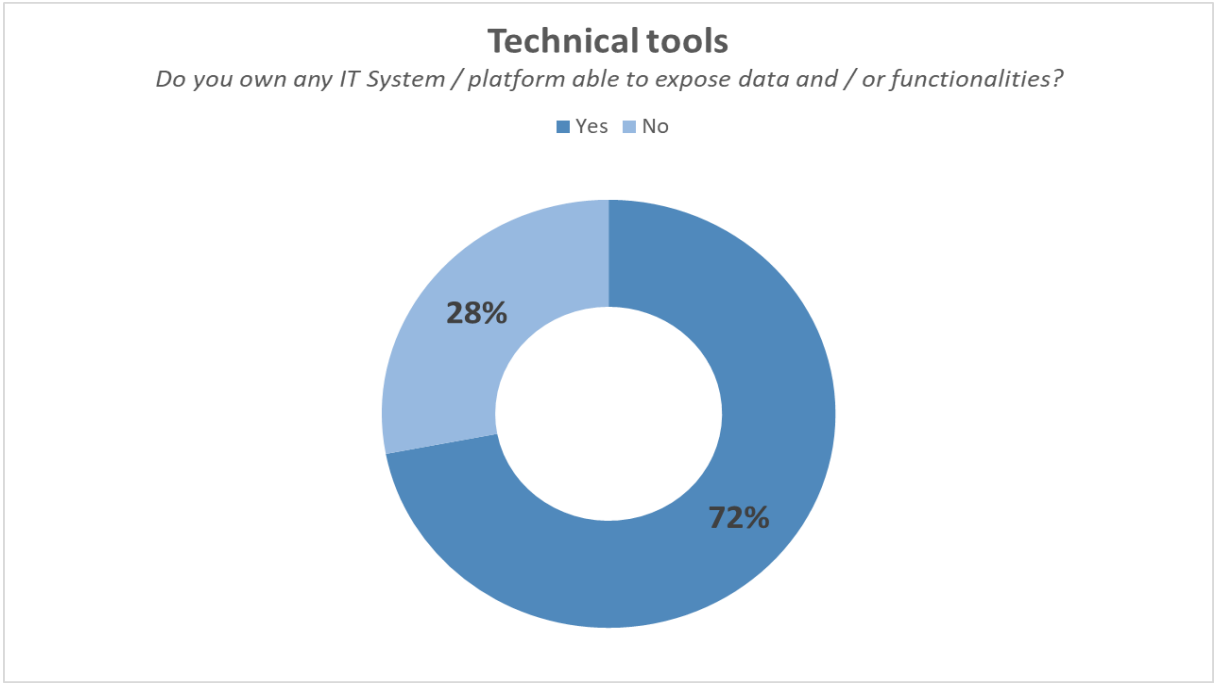
(E)DIHs see themselves as the main provider or facilitator to AI infrastructures for testing. At the European DIH network at least 1 EDIH per country is focused on AI, as specifically required by the DIGITAL programme, for providing knowledge and services within the network. It is interesting to note that even if TEFs and EDIHs are expected to collaborate in the years to come, (E)DIHs are still not considering them as a relevant stakeholder to access AI infrastructures, mainly for the time gap with the TEFs operations, which started later (June 2023).

The existence of different innovation ecosystems supporting SMEs or large companies will require the establishment of boundary conditions or models of collaboration between (E)DIHs and TEFs. The collaboration of these two bodies, both supported through DIGITAL programme, will be a key topic for the Coordination and Support Action of the TEFs[9].

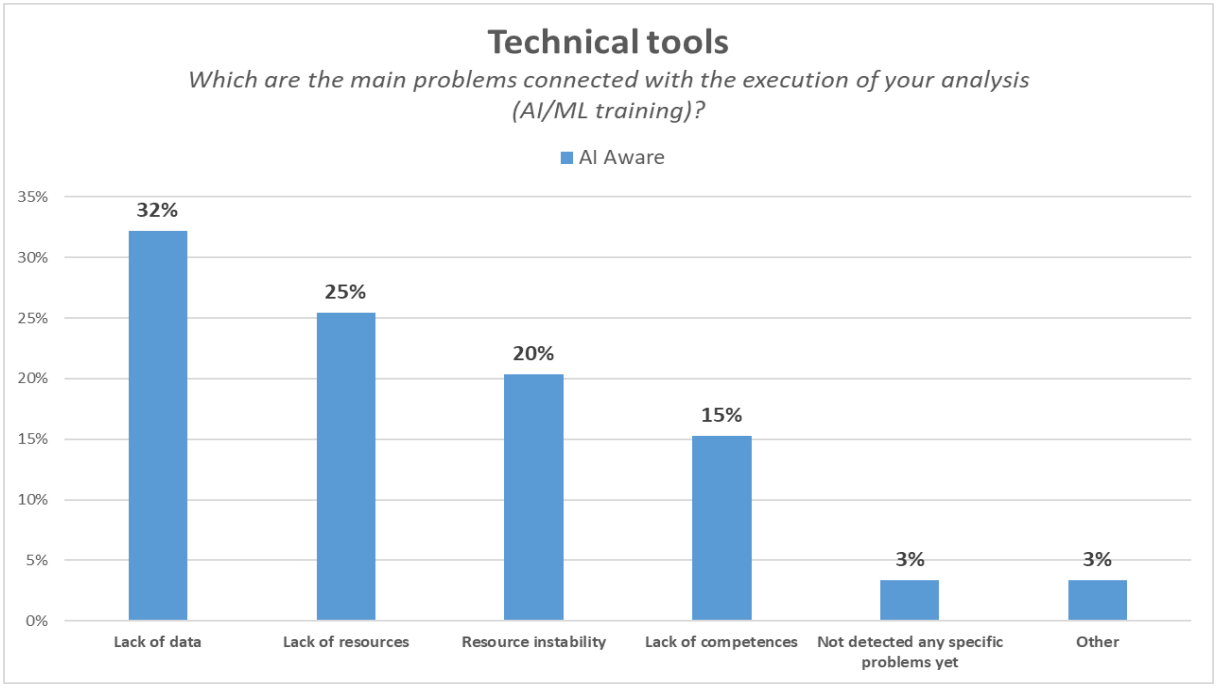
[9] DIGITAL-2023-CLOUD-AI-04-COORDINATEF. Coordination of AI sectorial Testing and Experimentation Facilities. Submission deadline 26th September 2023.



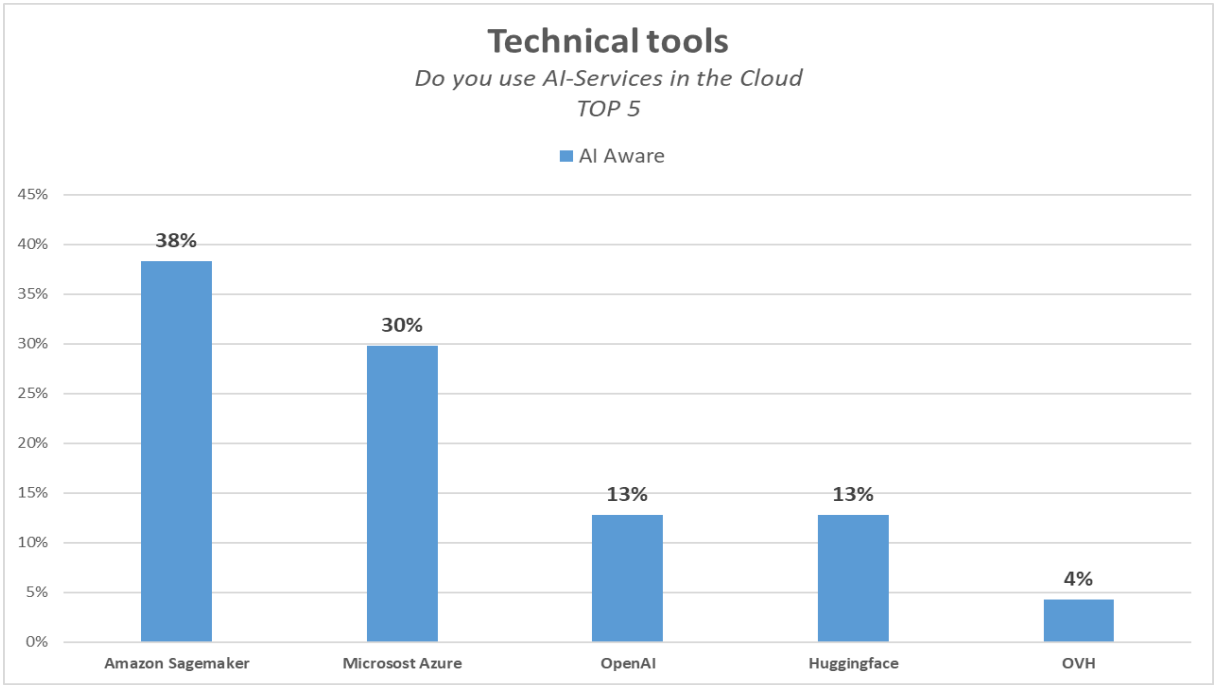
More than half of the AI aware (E)DIHs are acquainted with the GPU needs for training processes in AI/ML applications. Less hubs are knowledgeable with the requirements of GPU for inference/application, since these may also vary on the specific development.



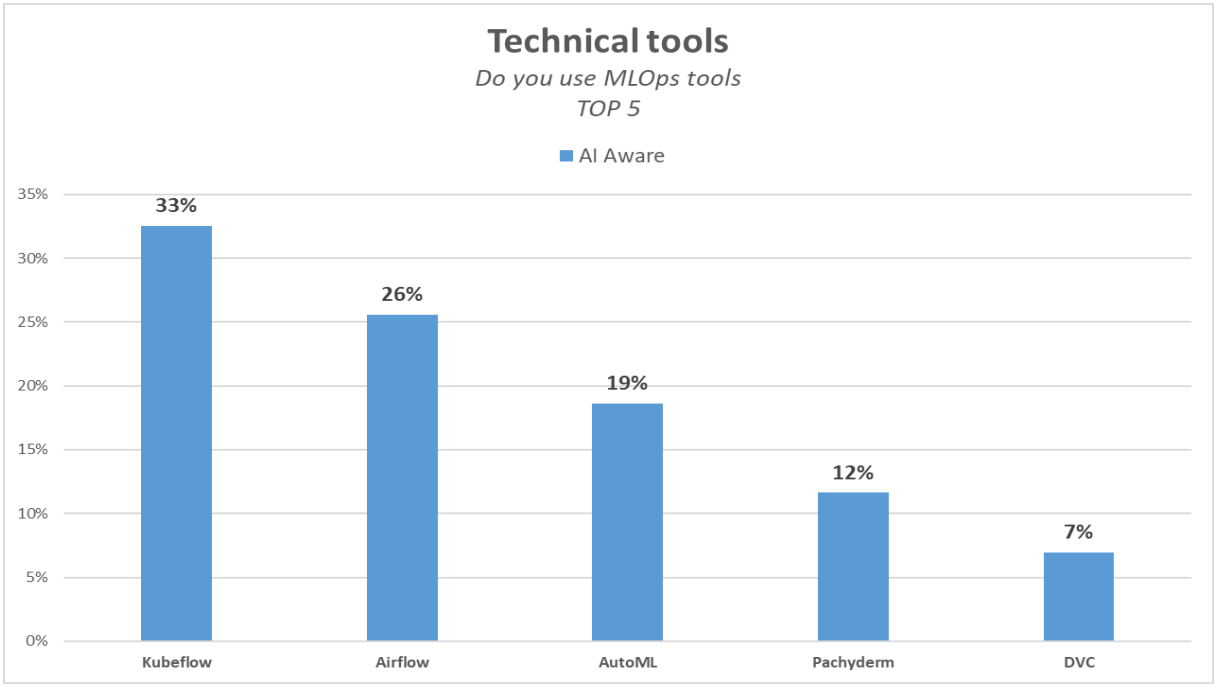
In line with some of the other stakeholders, most of the (E)DIHs are aware of the IT systems and functionalities to expose data, as the ones provided from large corporates (Google AI, Microsoft Azure AI, etc. that are offered along common IT services.



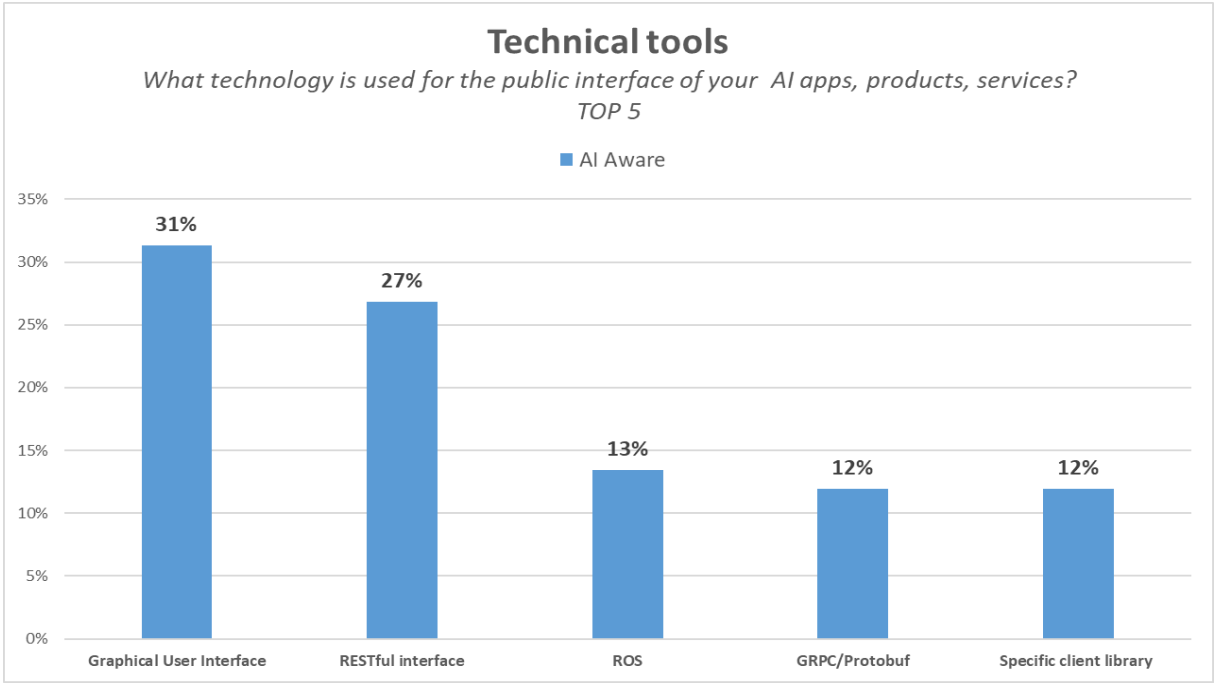
In line with previous answers, lack of data is seen as the main barrier when it comes to executing their analysis; this is a common barrier and researchers are stepping into synthetic data to provide learning for AI/ML. Structural challenges as, lack of resources together with resource instability is considered the second problem, followed by the lack of competences.



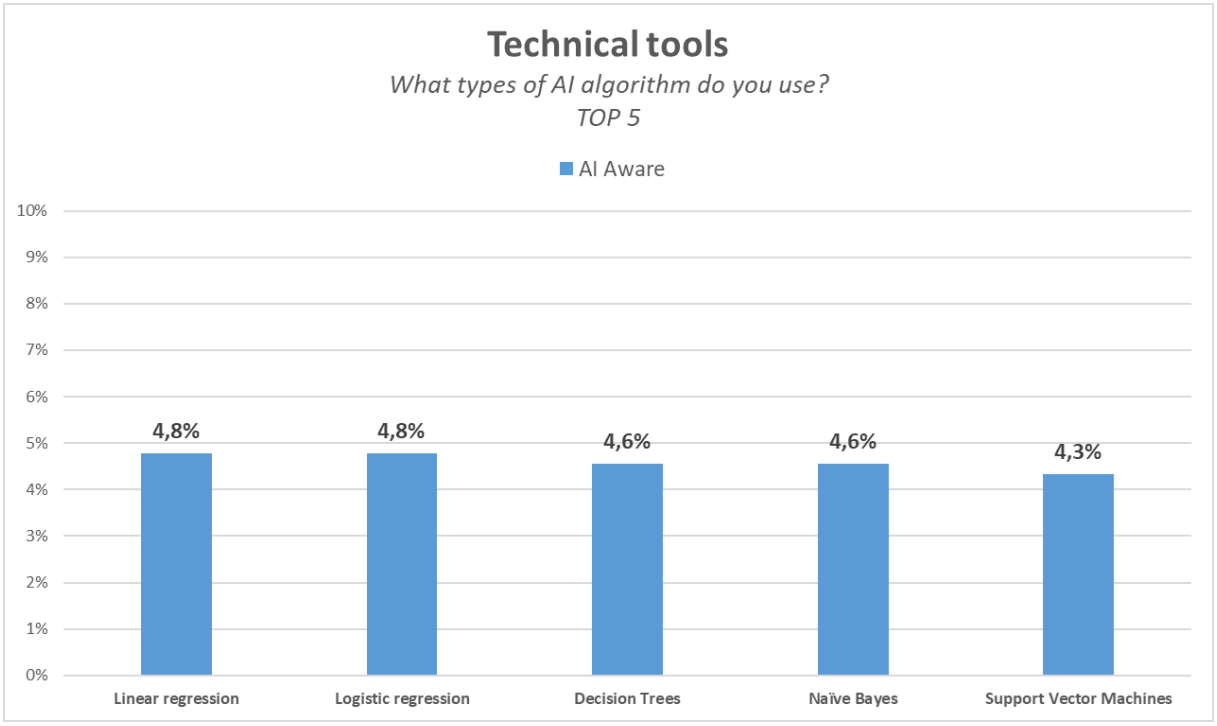
AI aware (E)DIHs are already users of AI services in the cloud, being the most popular providers Amazon and Microsoft, aligned with the use of IT services.



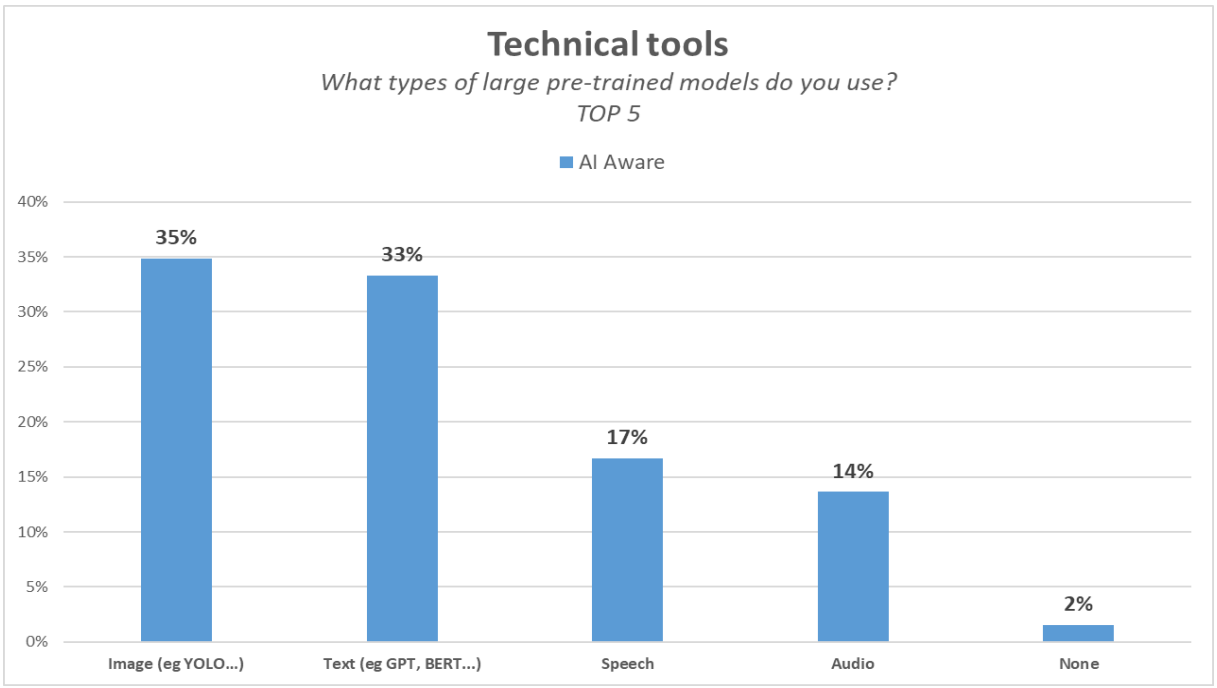
The use of MLOps tools for data processing is extended in the AI aware (E)DIHs, with the main use of Kubeflow and Airflow. It is understood that these (E)DIH have specialized personnel for these capacities.



Graphical User Interfaces, followed by RESTful interfaces are the technologies with wider usage among AI aware (E)DIHs. Not only direct AI applications or services are used but also within robotics applications from the 13% of ROS used for public interface.

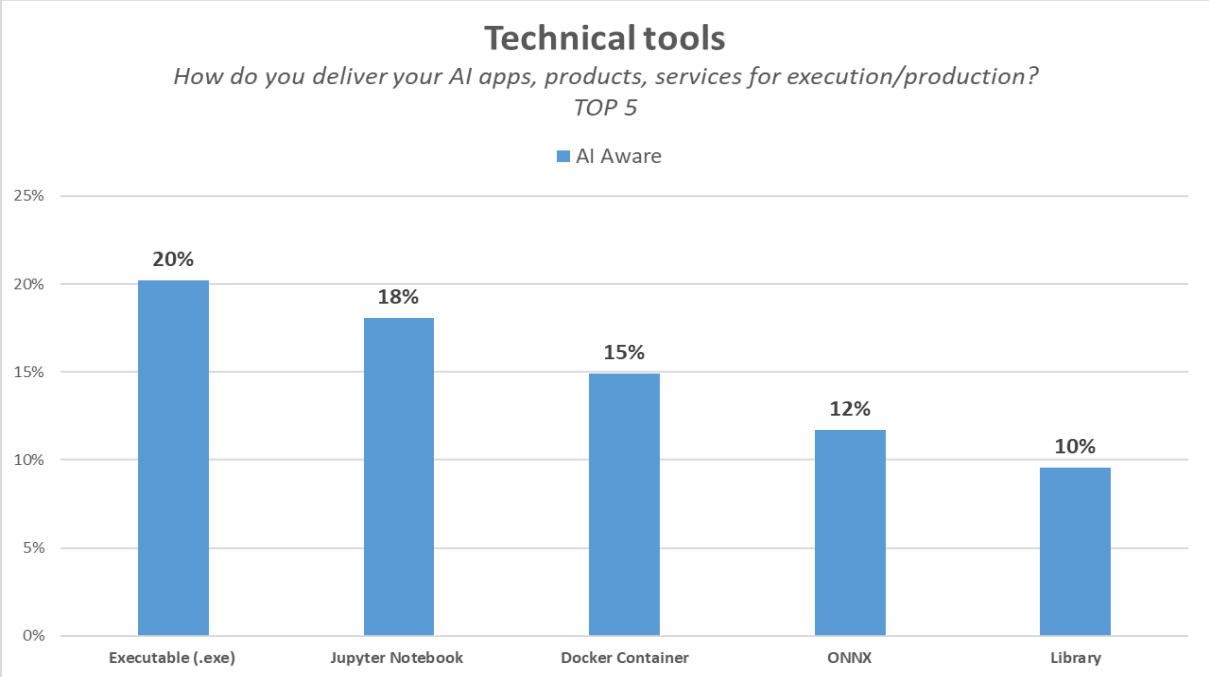


The AI algorithms mostly used are linear regression, logistic regression, decision trees, Naïve Bayes and Support Vector Machines, which are the most used also in ML applications (mainly for Python programming).



As per the pre-trained models, the most used ones are those related to image processing, followed by text, speech and finally audio. This is aligned with the initial emergence of ML algorithms, with main applications in image processing and automated data extraction in sectors of interest, and specifically industry related.

Regarding the delivery of AI apps, products and/or services for execution and production executable (.exe) files are the most used ones, which also allows an easiest and quickest share with customers or for own development.



"The AIoD platform is a central platform with a large variety of resources and information for AI-related matters in Europe. <We> can/will use such a platform as a source of materials for designing workshops, building demonstrators and for the identification of SME use cases. As such, resources such as datasets, ML models and coding examples, but also information regarding AI and ethics as well as law are all very useful for us."

Dr. Christoph Besenfelder from the Technical University of Dortmund, partner at Digital Hub Logistics.

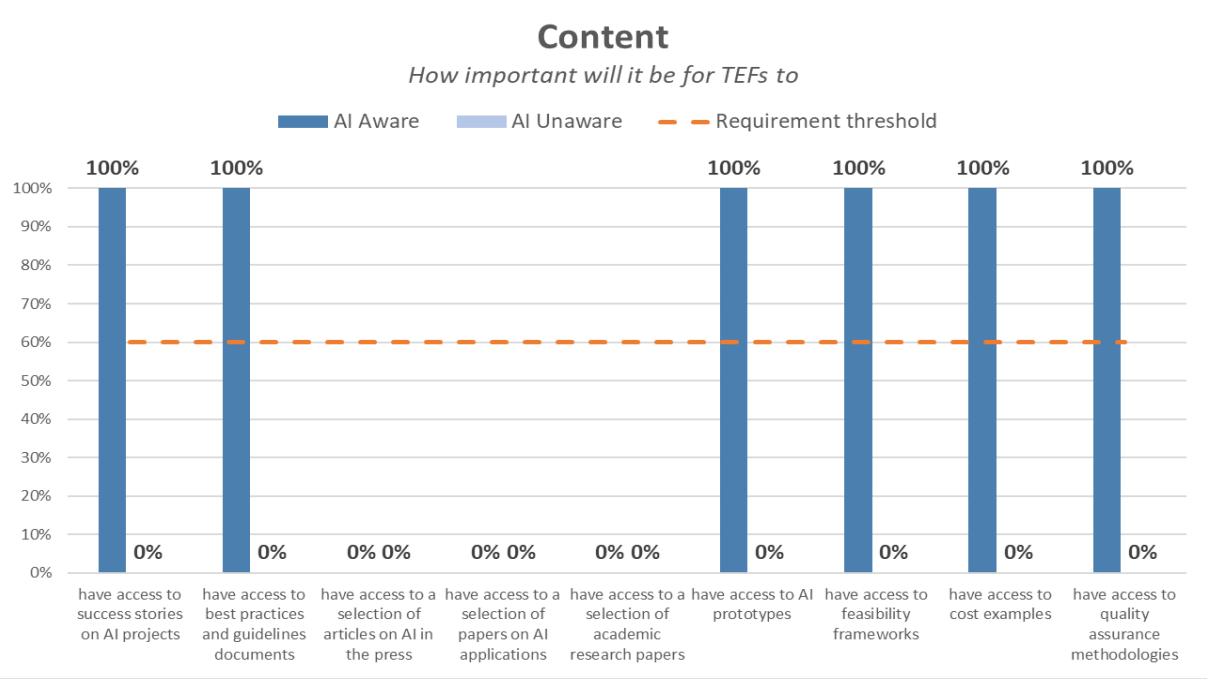
10.3.2 Requirements - TEFs

10.3.2.1 Contacts

A specific working group would be useful to work on how relationships between EDIHs, TEFs, AIoD platform could be built.

All respondents consider access to AI solutions providers, like-minded companies, TEFs, DIHs & networking opportunities to find funding and sponsors as important.

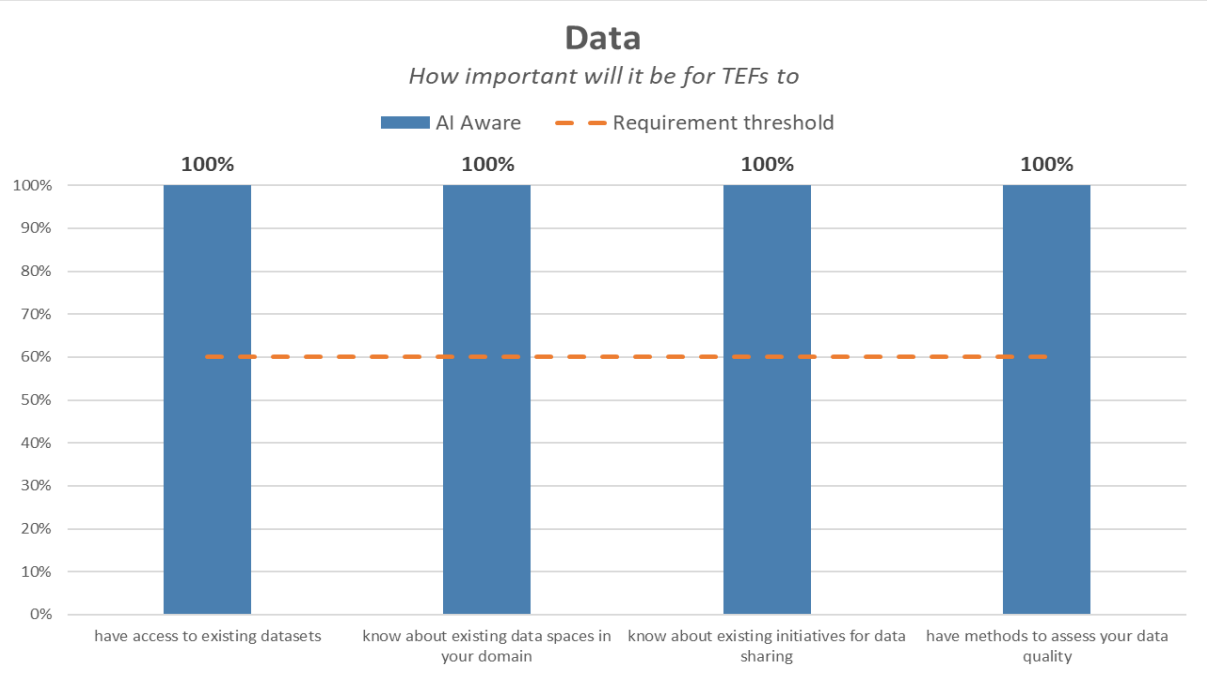
10.3.2.2 Content



All respondents consider access to success stories, best practices and guidelines, AI prototypes, cost examples, feasibility frameworks & QA methodologies as important.

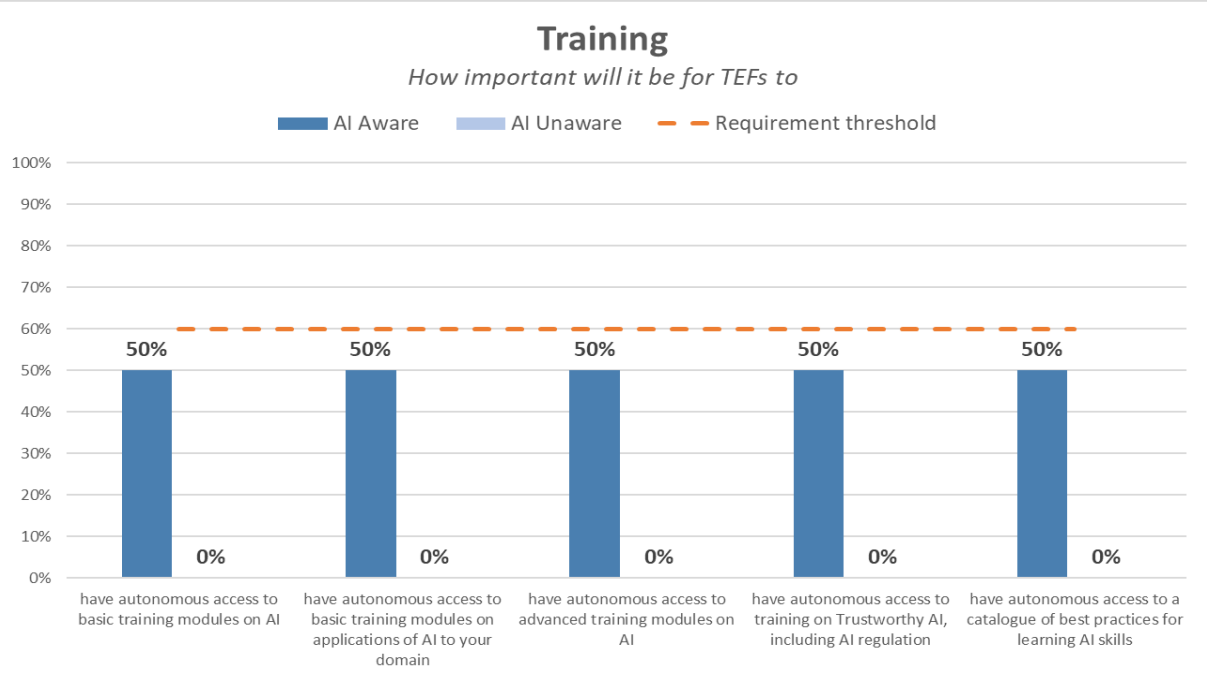
10.3.2.3 Data

There is a concern about what will be done with the data produced and how this data will be shared.



All respondents consider access to datasets, data spaces, data sharing initiatives & data quality assessment methods.

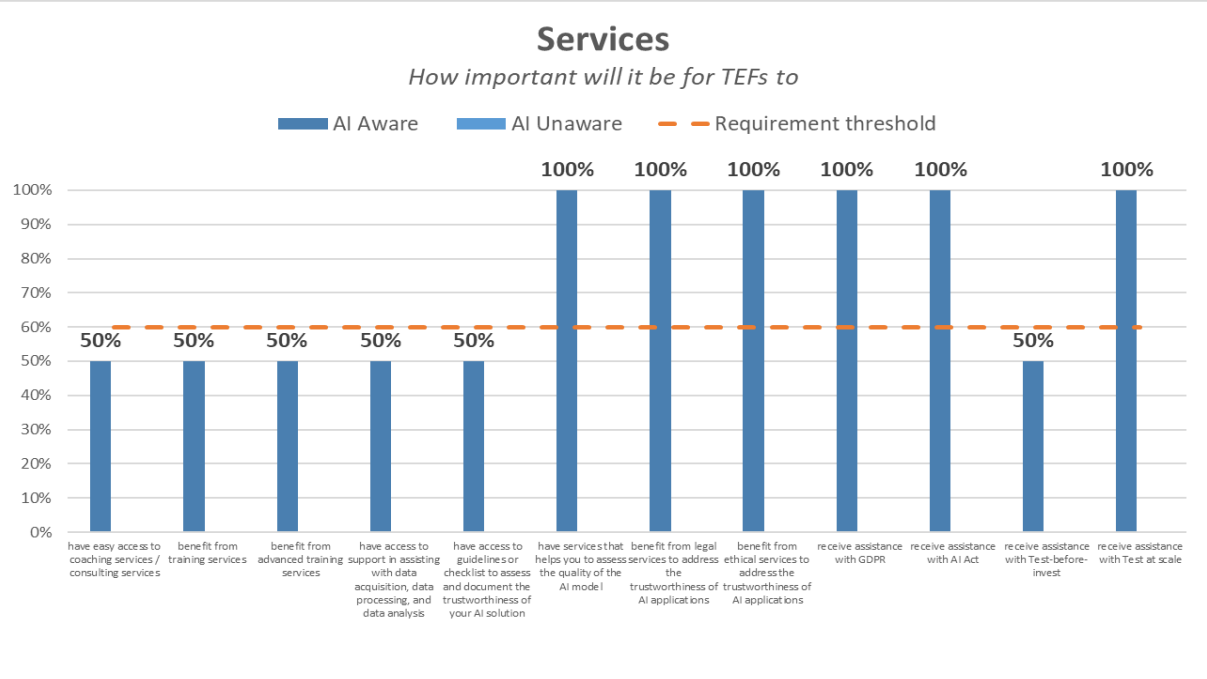
10.3.2.4 Training



Only half of the respondents consider access to different types of training as important. This percentage though is below the requirement threshold.

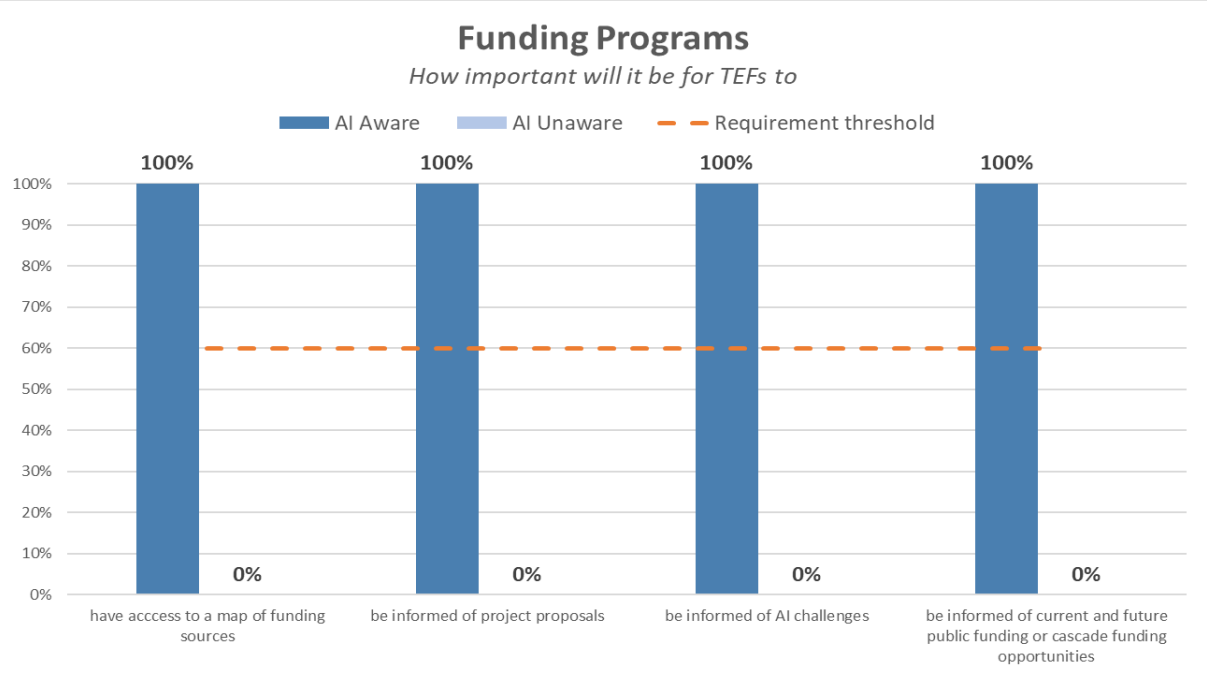
10.3.2.5 Services

> *"The AIoD platform would be an opportunity for TEFs to provide additional coverage / visibility / coordination for services"*
>
> *"Clarify the boundaries of EDIH, TEF, AIoD platform's services offer, e.g., for consulting services"*
>
> Representative of AI-MATTERS TEF



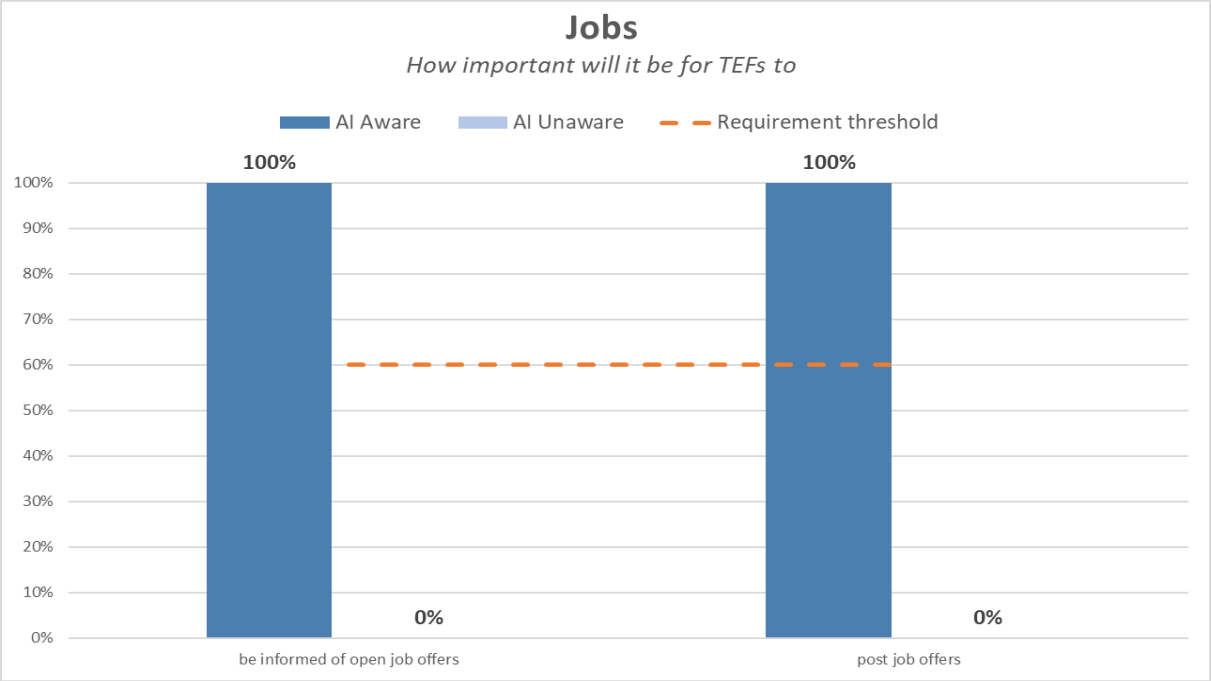
Regarding the desired services offered by the platform, all AI aware TEFs reported AI model quality assessment, legal & ethical, GDPR, AI Act and test-at-scale assistance as important.

10.3.2.6 Funding programs



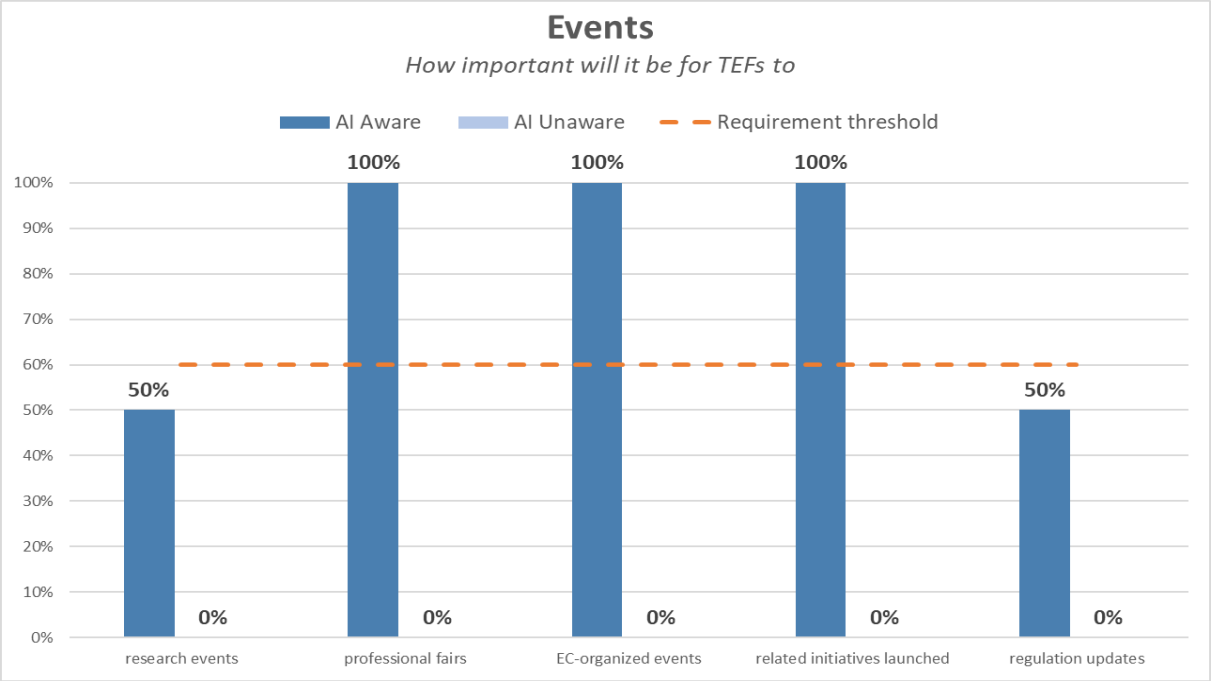
All TEFs would like to have access to funding program opportunities, such as a map of funding sources, project proposals, AI challenges, current and future public funding or cascade funding.

10.3.2.7 Jobs



All TEFs would like to be informed about open job offers and be able to post job offers.

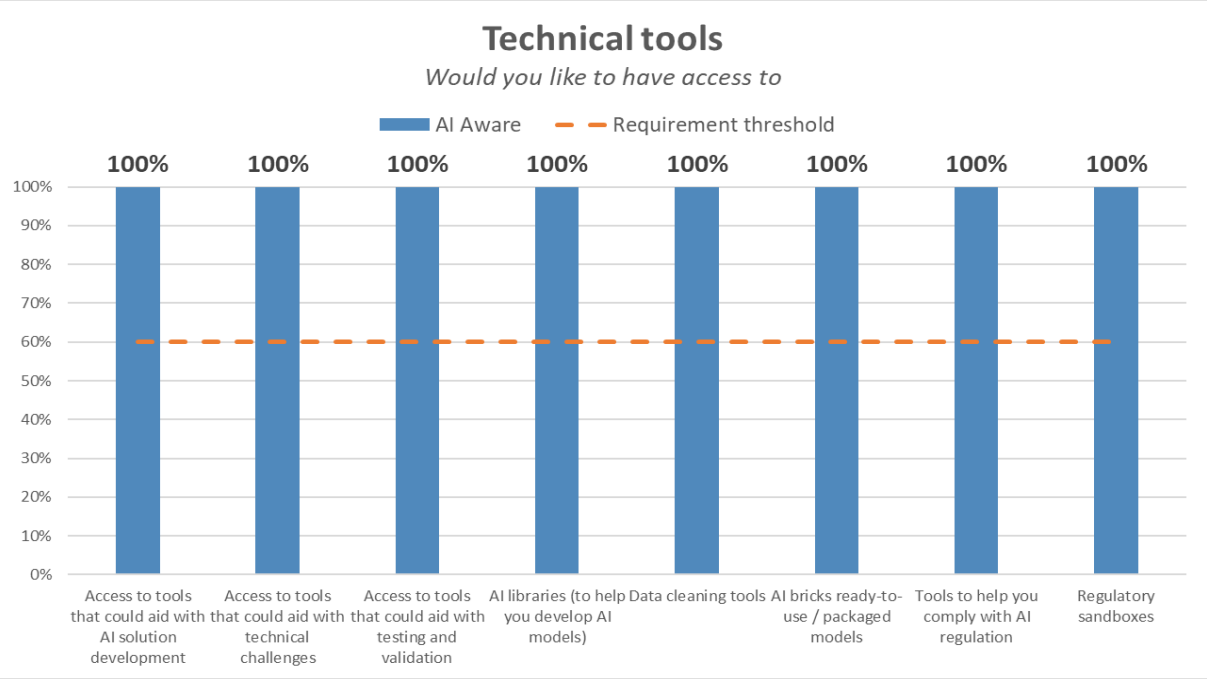
10.3.2.8 Events



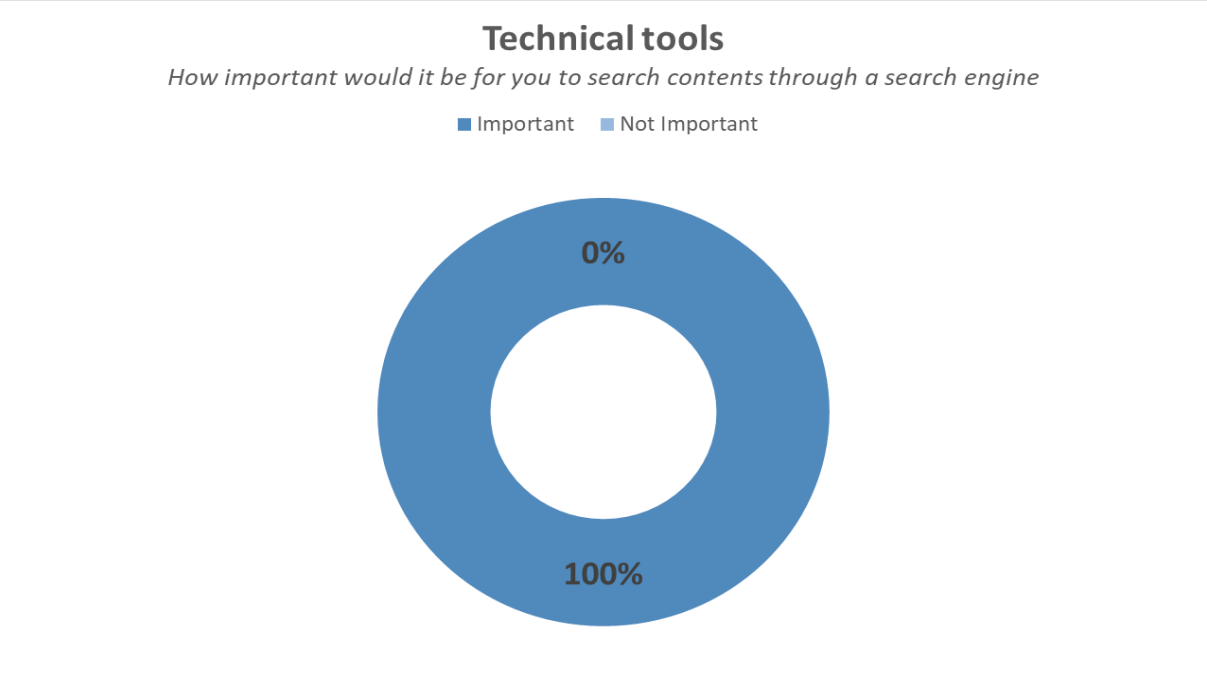
All TEFs would like to have access to events such as professional fairs, EC-organized events and the launch of related initiatives.

10.3.2.9 Technical tools

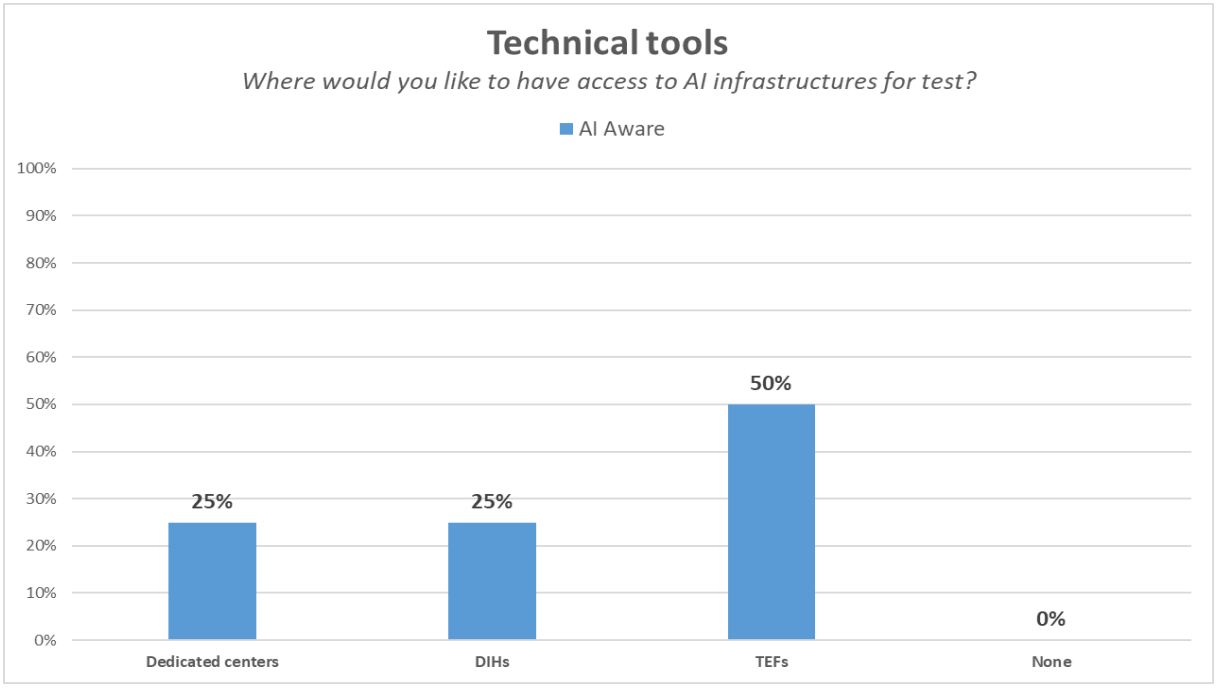
When reading this chapter, please take into account that in multiple-choice questions, the percentages in the graphs correspond to the percentage of respondents' answers and not to the respondents themselves. The low volume of responses from TEFs therefore makes it difficult to provide a detailed analysis of needs.



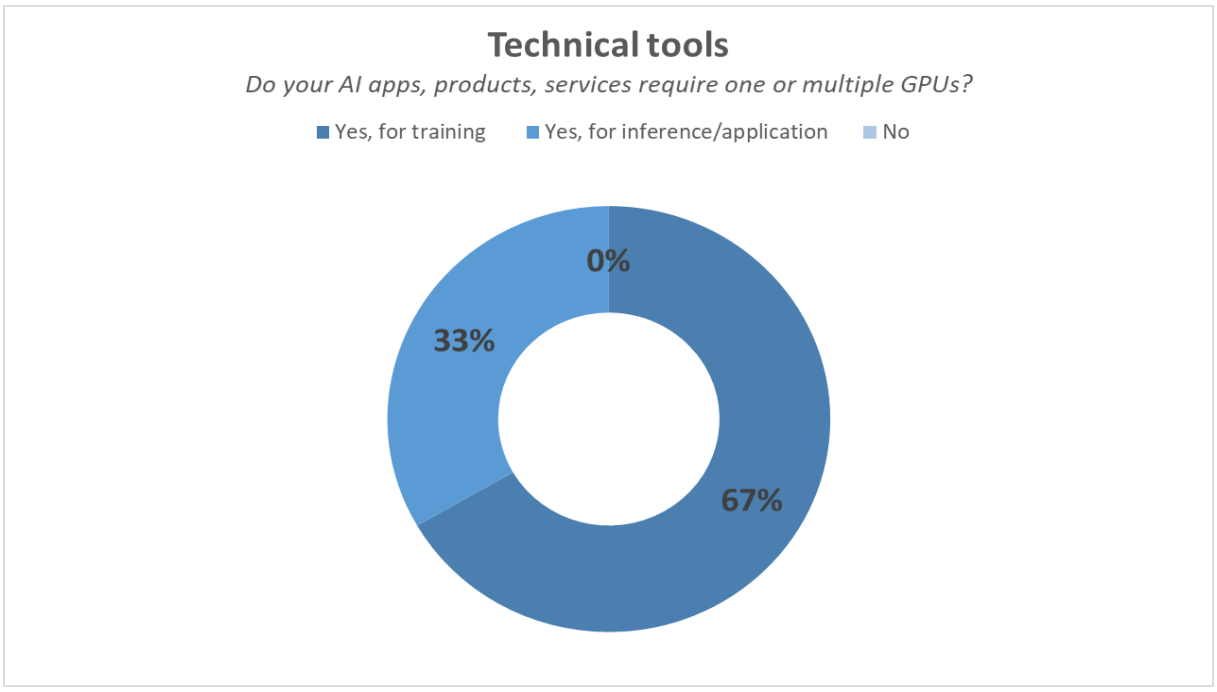
Access to all types of technical tools is important for all TEFs.



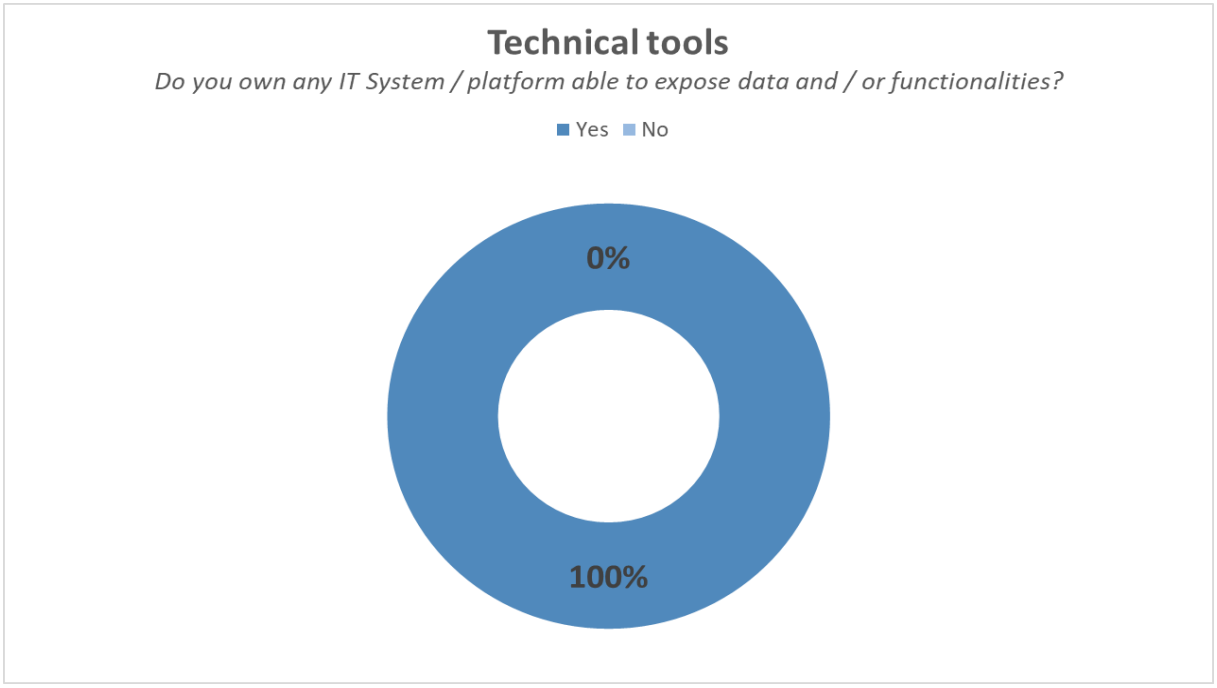
It is important for all TEFs to be able to search contents through a search engine.



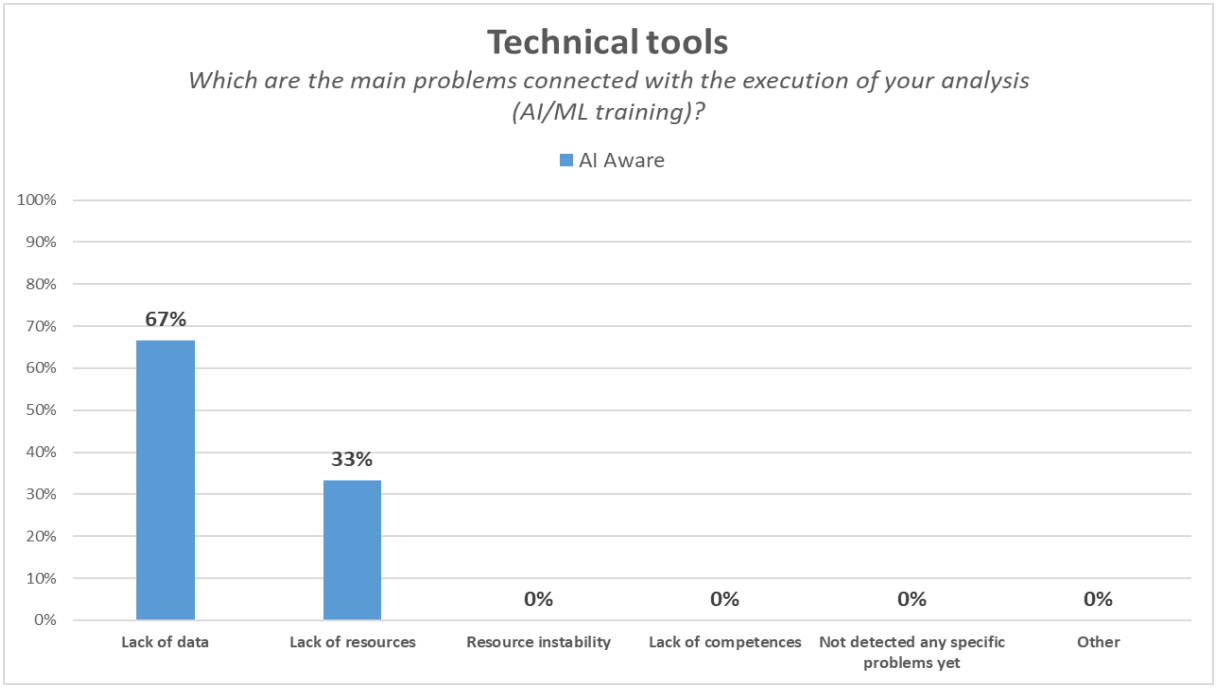
50% of the answers provided by the TEFs showed a preference for access to other TEFs as AI testing infrastructures and 25% to dedicated centers and DIHs.



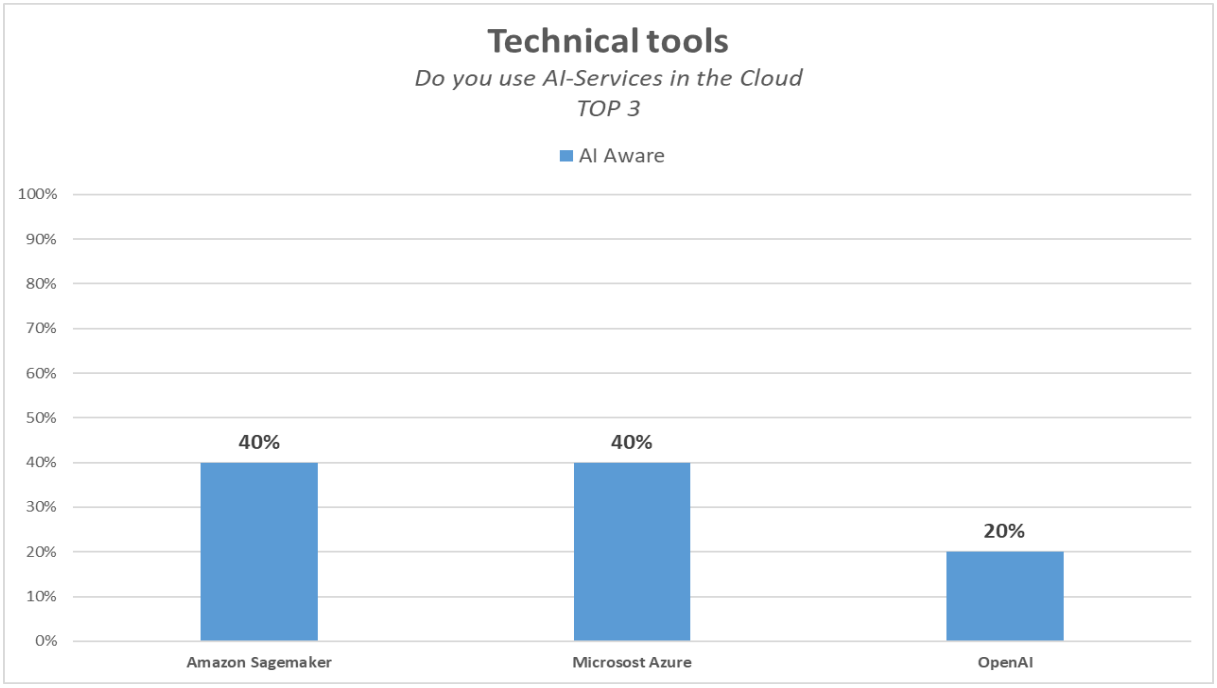
67% of respondents' answers indicated that their AI apps, products or services require at least one GPU.



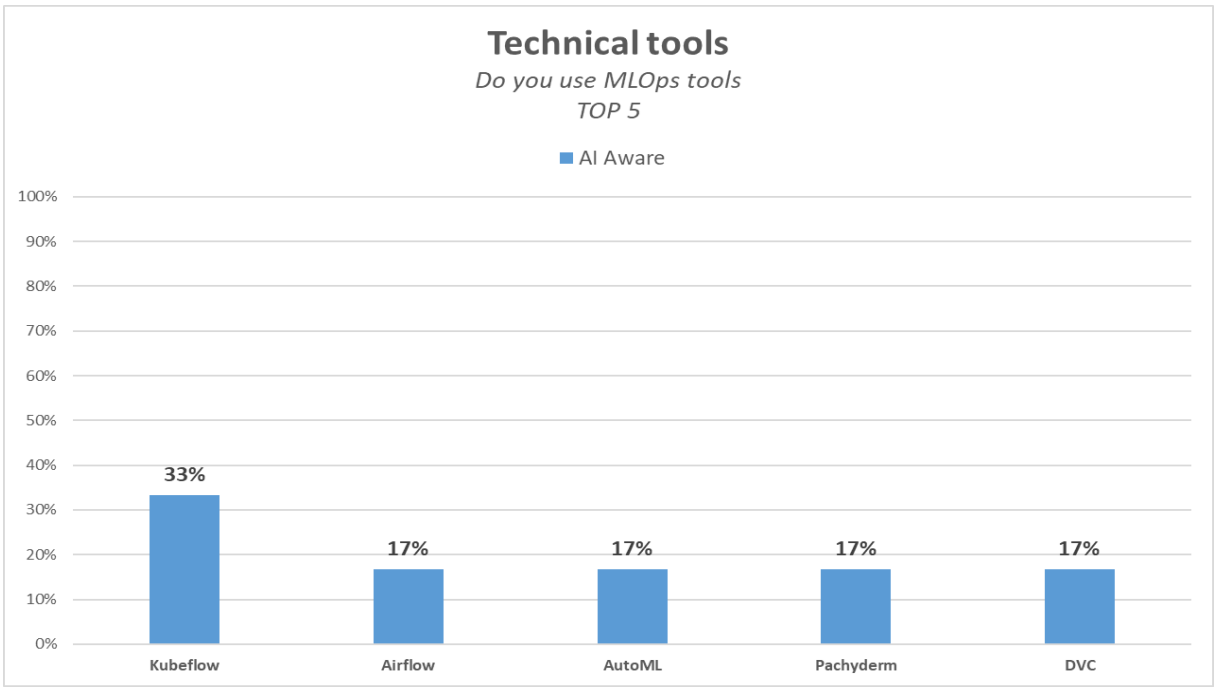
All respondents reported that they own an IT system / platform that is able to expose data and / or functionalities.



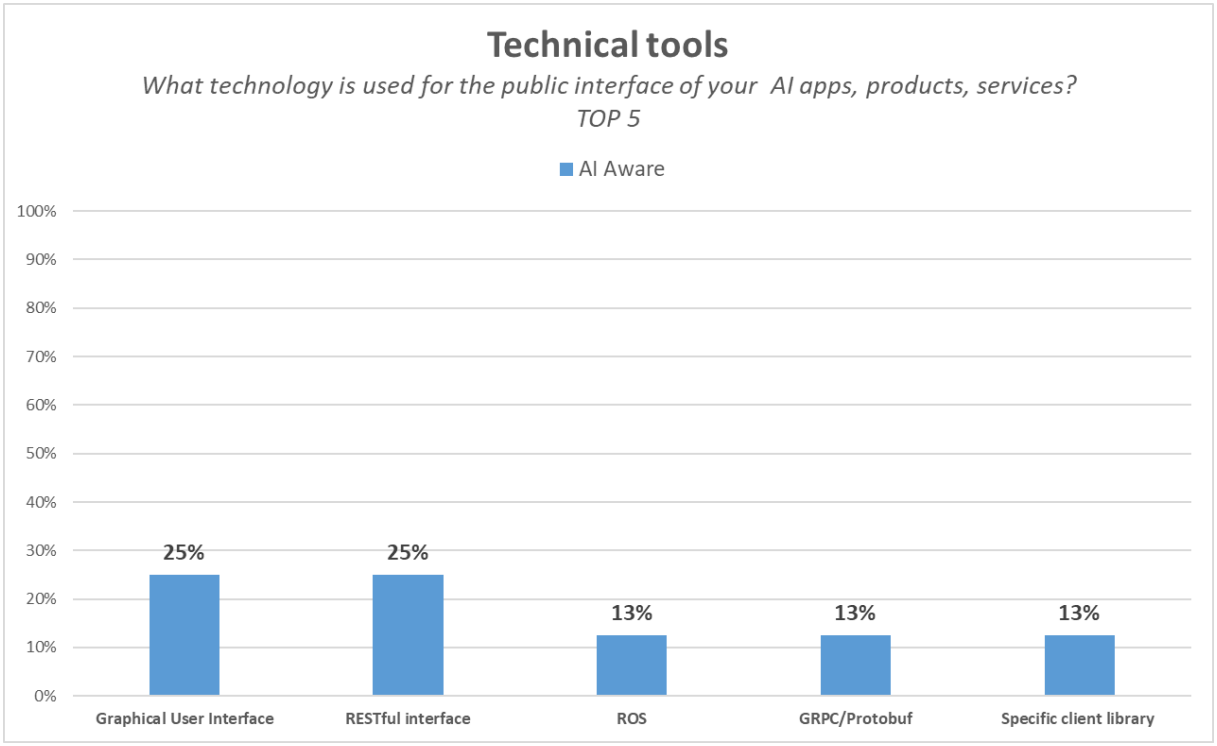
2 out of 3 respondents' answers indicated that the lack of data is the main problem connected with the execution of their analysis (AI/ML training) and 1 out of 3 reported the lack of resources.



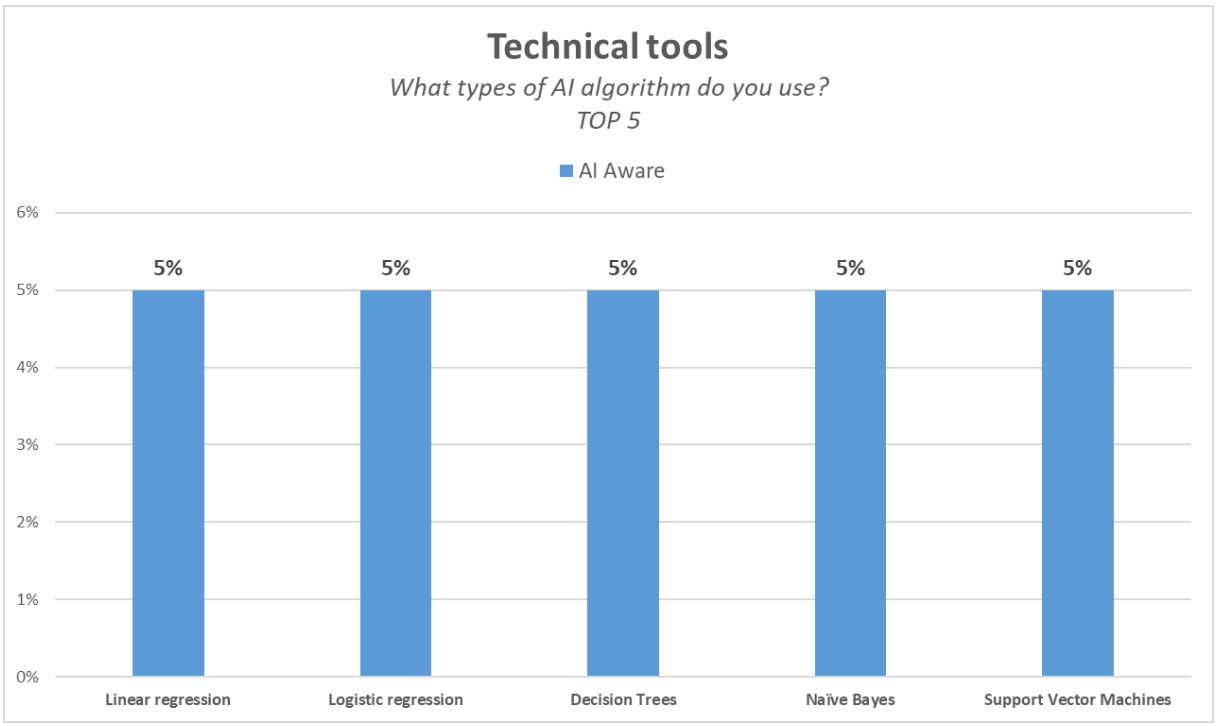
The top 3 AI-services that are used in the cloud are Amazon Sagemaker (40%), Microsoft Azure (40%) and OpenAI (20%).



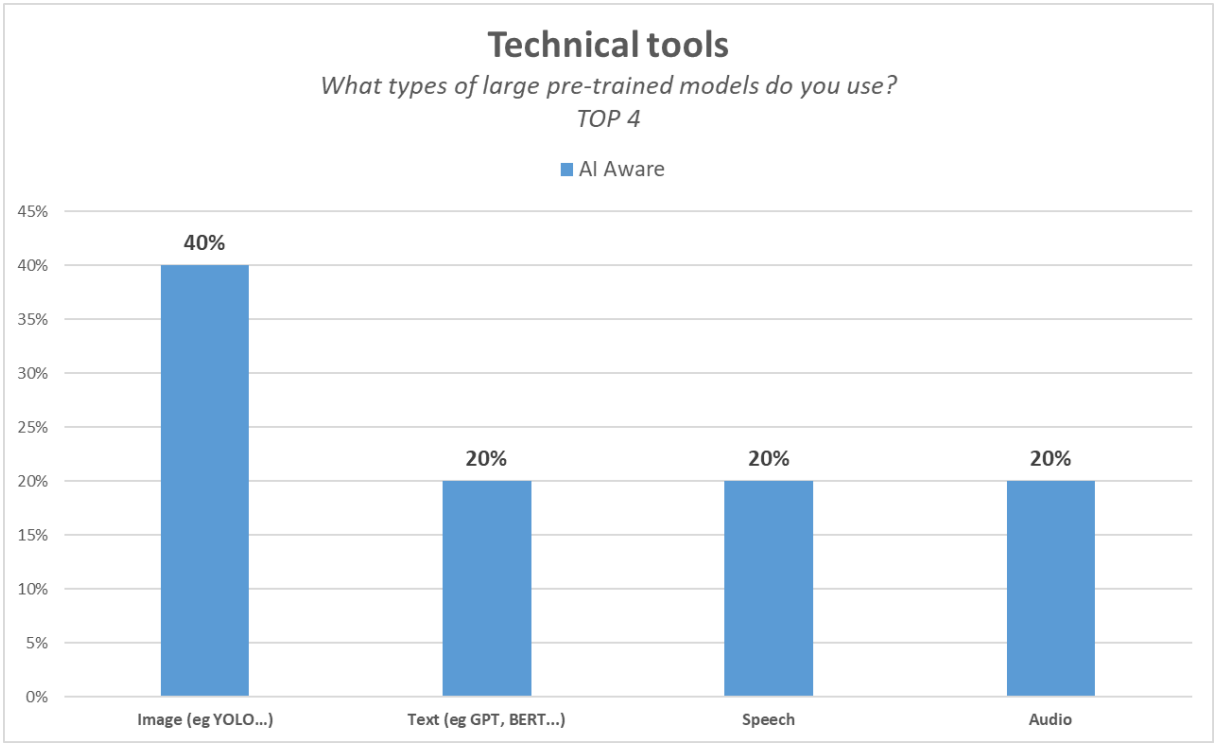
33% of respondents 'answers report the use of Kubeflow as an MLOps tool.



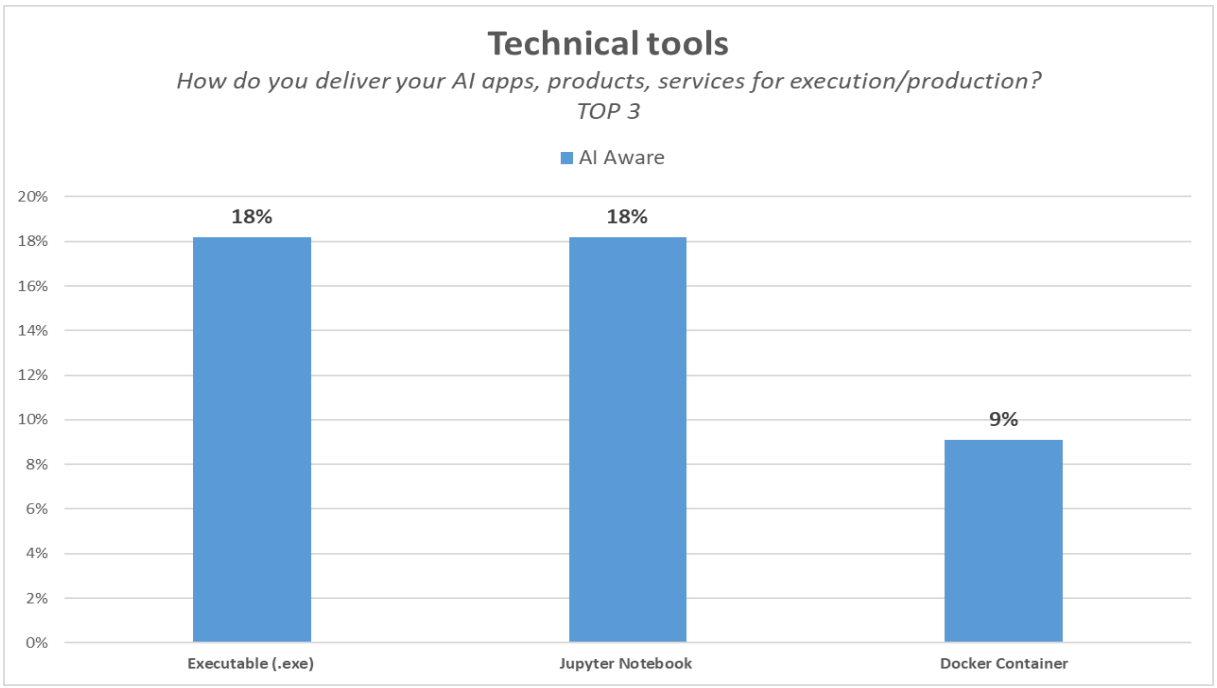
There is a slight preference of Graphical User Interface and RESTful interface as public interfaces among respondents' answers.



There is no clear prevalence of AI algorithms among AI algorithms used by the TEFs and the low volume of TEF responses makes it unsuitable to get insights.



The top 4 types of large pre-trained models used by TEFs are Image (40%), followed by Text, Speech and Audio (20%).



The top 3 ways AI apps, products and services delivered are Executable and Jupyter Notebook (18%) and Docker Container (9%). The low volume of TEF responses makes it unsuitable to provide insights.

10.3.3 Overview of existing literature

The literature review has been done considering the relevance and link to the European Digital Innovation Hubs and the Digital Innovation Hubs. They gather important findings that should be analyzed together with the survey results. Different EU projects have been working in defining enabling frameworks for (E)DIHs as brokers towards their local SMEs. The role of these innovation ecosystems (DIHs and TEFs) will be key to fostering the uptake of AI and other key technologies by SMEs.

10.3.3.1 DIH Survey Report by BonsApps project

Date of the review	29/03/2023
Name of the project or initiative / report reviewed	DIH Survey Report
Project Owner / Author	BonsApps/ FundingBox
Link to the project or any useful documents	https://live-bonsapps.pantheonsite.io/wp-content/uploads/2022/06/D5.4_DIH_Suvey_Report_FINAL_16062022.pdf
Main functionalities delivered by the project / Main points covered in relation to DIHs	
The report includes results and conclusions based on answers from the targeted group of Digital Innovation Hubs that filled out the DIHs survey done by BonsApps project between 03 - 05.2022. The results of the survey cover the description of a target group of DIHs interviewed, AI Adoption challenges in their local ecosystems (SMEs focused) and analysis of the needs of DIHs in their mission to support their network. The highest number of DIHs that answered the survey were from Italy, Romania and Greece. 3 DIHs coming from Africa (1 reply per each: Ghana, Mozambique and South Africa) are most probably the effect of FBOX's involvement in AEDIBNET project that aims to build the ecosystem of DIHs in Africa and could bring an interesting reflection that DIHs from that countries are also interested in AI Adoption.	
Review summary note	
The main conclusions that we can extract from this report are that DIHs struggle supporting SMEs in the adoption of AI due to the lack of datasets available at company level, staff is not yet ready for the AI transformation (they need more training) and the problems of finding customizable solutions fitting SMEs needs/challenges. Additionally, DIHs reported that there is a still a long way to cover AI skills within the companies, from blue collar employees to the higher management levels, and increase raise awareness activities to show the benefits and applicability of AI solutions.	

10.3.3.2 Strengthening Digital Innovation Hubs with the European AI on-demand platform

Date of the review	29/03/2023
Name of the project or initiative / report reviewed	Strengthening Digital Innovation Hubs with the European AI on-demand platform
Project Owner / Author	The study was carried out by University College Cork and EIT Digital with the support of AI4EU and DIHs experts
Link to the project or any useful documents	https://zenodo.org/record/6483645#.ZCPstexByWZ
Main functionalities delivered by the project / Main points covered in relation to DIHs	
The document sheds light on the nature of the relationship and interactions between the pan European AIoD platform and the regional (E)DIHs. Additionally, provides recommendations on how	

DIHs can work together to serve the interests of their stakeholders and how both initiatives can best support and complement one another. This White Paper introduces the on-demand platform, the European AI landscape and DIHs, presenting an overview of the evolution of DIHs. The respective offerings of the AI-on-Demand platform and the services of DIHs. Finally, the report includes a presentation of the outputs of work of consultation that focused on the value AI on-demand platform can offer DIHs in different service categories and key recommendations.
Review summary note
An analysis of the marketplace showed that some gaps included an understanding of SME needs, a reference point for information, integration and alignment, efficient EU-wide collaboration, and awareness. The analysis also found that the DIH ecosystem lacked a central site where DIHs working with AI could meet, learn, connect, exchange, discuss, matchmake, combine expertise, and receive policy support and an overview of existing capacities such as existing projects and networks. As a reference point for information, a pool of strategic European AI tools, services and expertise, and a site for exchange and community building the future AI on-demand platform could thus fill DIH gaps by integrating and aligning European and regional AI-related offerings. The technical offerings that this report highlights as offering value to DIHs are tools and resources to support SMEs with AI solution development, testing and validations, data services and matchmaking possibilities to find suitable AI experts or solutions. Regarding the ecosystem related offerings, experts mention the interest in creating networking or cooperation spaces, results sharing features and communication strategies or raise awareness activities to activate SMEs. Additionally, access to TEFs and European Data Spaces could be as well explored. In the area of ethical AI, the platform could support DIHs by offering advice on ethical guidelines and legal compliance as well as the principles of AI. This support could be offered in the form of facilitating access to AI legislation training courses and a trustworthy checklist aligned to the Assessment List for Trustworthy Artificial Intelligence (ALTAI) and the EC's legal framework on AI. In the service category, skills support, the AI on-demand platform could provide catalogue of courses, best practices for teaching AI skills, and recruitment services including job offerings and demands. The platform could also provide research documents and materials that could be used for AI training and education and upskilling opportunities. To facilitate AI solution development for DIHs the platform could provide use cases organized per sector, success stories, innovation practices, user journeys, prototypes, feasibility frameworks, cost examples, quality assurance methodologies and best practices for comparison.

10.3.3.3 I4MS Initiative of the pan-european network of dihs: learnings and recommendations

Date of the review	29/03/2023
Name of the project or initiative / report reviewed	I4MS learnings and recommendations
Project Owner / Author	I4MS4Ts project
Link to the project or any useful documents	https://i4ms.eu/i4ms-lessons-learnt/
Main functionalities delivered by the project / Main points covered in relation to DIHs	
This report presents the overall findings and lessons learnt of I4MS project and a set of recommendations that aim at capturing those key messages and suggest actions to improve the support provided to the SMEs, paving the way of accelerated digitalization of the European manufacturing SMEs and midcaps.	

Despite progress made, the uneven levels of innovation in the different Member States remain, and there is still room for further alignment of the EU, national and regional policies supporting digital transformation of manufacturing SMEs. Synergies between Horizon Europe and other EU/national initiatives could still be improved to provide a more holistic support covering the needs of SMEs from the development and deployment of new technologies to its commercialization. The role of the EDIHs can contribute to aligning the support and policy development at national and European level. EDIHs can be seen as the compass for SMEs, since digitalization is not a matter of excellence, but rather a change on day-by-day work. It also a good example of blended funding by co-investing European and national funding into the EDIHs actions to support SMEs. This can contribute to facilitate the policy alignments between national and European policies.
Review summary note
One of the obstacles for SMEs to departure their digital transformation journey is simply lack of information of digital technologies, and especially related to the benefits digitalization can offer to their business. Therefore, the work on raising awareness is still of utmost importance. I4MS experience has shown how peer-learning and exchange of information on real business cases are of interest for the SMEs and stakeholders. Companies, and especially SMEs, need to see the benefits and the value-added of digital transformation through real-world examples. The good practice examples should be collected widely, in terms of industrial sector and geographical location of companies, to provide peer-to-peer learning opportunity for a broad spectrum of SMEs. The I4MS Success Stories represent some examples of how SMEs can reap benefits from the on-going transition. Examples of success stories from I4MS and similar initiatives could be used to showcase the impact of the technologies in daily business operations. Presenting technologies as a way to improve productivity, despite the investments needs, might be crucial to change SMEs' mindset and make small companies more prone to invest in new technologies. The EDIHs should have a clear role identifying these success stories. The Digital Innovation Hubs (DIHs) and the newly launched network of European Digital Innovation Hubs (EDIHs) have key functions in raising awareness of digital transformation and acting as intermediaries between digital technology providers and SMEs. This "one-stop shop" approach is clearly needed to ease the access of SMEs to technical expertise and funding opportunities on the one hand, and to open-up the market for technology providers on the other. DIHs and EDIHs are playing a key role that should be further improved and supported. Awareness raising is a key activity to make this process successful. Also, EDIHs will have an important role in bringing new services and opportunities closer to the local SMEs.

10.3.3.4 Digital Innovation Hubs Proposing Digital Platforms to Lead the SMEs Digital Transition

Date of the review	02/05/2023
Name of the project or initiative / report reviewed	Digital Innovation Hubs Proposing Digital Platforms to Lead the SMEs Digital Transition
Project Owner / Author	Claudio Sassanelli, Silvia Razzetti, Walter Quadrini, Sergio Gusmeroli and Sergio Terzi
Link to the project or any useful documents	http://ceur-ws.org/Vol-3214/WS8Paper1.pdf
Main functionalities delivered by the project / Main points covered in relation to DIHs	
This paper presented the main platforms grounded on the D-BEST model developed by different DIH networks. The main characteristics of each of them have been detected and the differences among them unveiled. The paper has some limitations, being focused only on the DIH networks developing their platforms grounded on the D-BEST. At the same time, this is a potential point to	

integrate the platforms based on their similarities and to trigger synergies among the different networks of DIHs.

Review summary note

The D-BEST model is composed of five macro-classes of services: Data, Business, Ecosystem, Skills, Technology.

The DIHIWARE platform is a solution created within the MIDIH project and currently employed in different ecosystems in Europe. It provides a collaboration environment grounded on the Enterprise Social Software concept, realizing a bridge among stakeholders with different experiences backgrounds, providing access to the up-to-date knowledge and expertise, pulling teams together and supplying a fertile ground for experimentation. These knowledge-driven services are fully integrated with collaborative services to create a digital space where stakeholders can collaborate to boost innovation. The main users of this platform can be reconciled to the following three families (Manufacturing SMEs (demand); Technology SMEs (offer); DIH (broker)).

The AI REGIO project proposes a platform to enable cross-collaboration inside its two main communities: DIHs and Didactic Factories (DF). DIHs have at disposal the Service Marketplace section to manage their portfolios of services according to the D-BEST taxonomy, as well as the catalogue of their Experiments and a collection of operational technologies, data analytics tools and platforms, designed to provide support to system integrators and technology adopters. DF have at their disposal the Service Marketplace where their services are showcased following the DR-BEST taxonomy (where the “R”, specific for DFs, stands for Remote).

The DIH4AI platform is tailored for the needs of DIHs acting for the development and adoption of Artificial Intelligence (AI) solutions. The marketplace is shaped according to the L-BEST taxonomy: “L” stands for “Legal and ethical” and displays all the services fitting with the request of preventing the risks deriving for AI adoption.

The HUBCAP collaboration environment delivers both “Access to” and “Collaborate with” services, not only offering access to up-to-date knowledge, expertise and technology but also providing MBD assets for testing and experimenting. In particular, HUBCAP has two catalogues of MBD assets (models and tools) usable through a sandbox by industrial players, technical developers, and decision makers.

On top of the aforementioned examples of collaborative portals at project-level, the DIHI4INDUSTRY platform has been conceived at Network-level to piece together several communities of DIHs active in the Digital Transformation of European Manufacturing Industry, encompassing hubs with different specializations and expertise, coming from different projects, and it aims at representing a single access point for DIH practitioners and policy makers. The platform presents the DIHs communities and Service Marketplace, as well as the catalogue of Experiments and success stories deriving from the implementation/provision of their services.

DIH4CPS platform’s users can be service provider and/or service consumer. To have such a role, the user should have some prerequisite competences (i.e., the needed competences related to a given service or activity, grouped under the D-BEST model) needing a proficiency level in a given domain (the competence area). The interface has been developed for the core network services, both for the ontology navigation (to help users to find the right partners for experiments/development tasks) and for managing the network model/ontology (allowing to enroll new DIHs and alter the model).

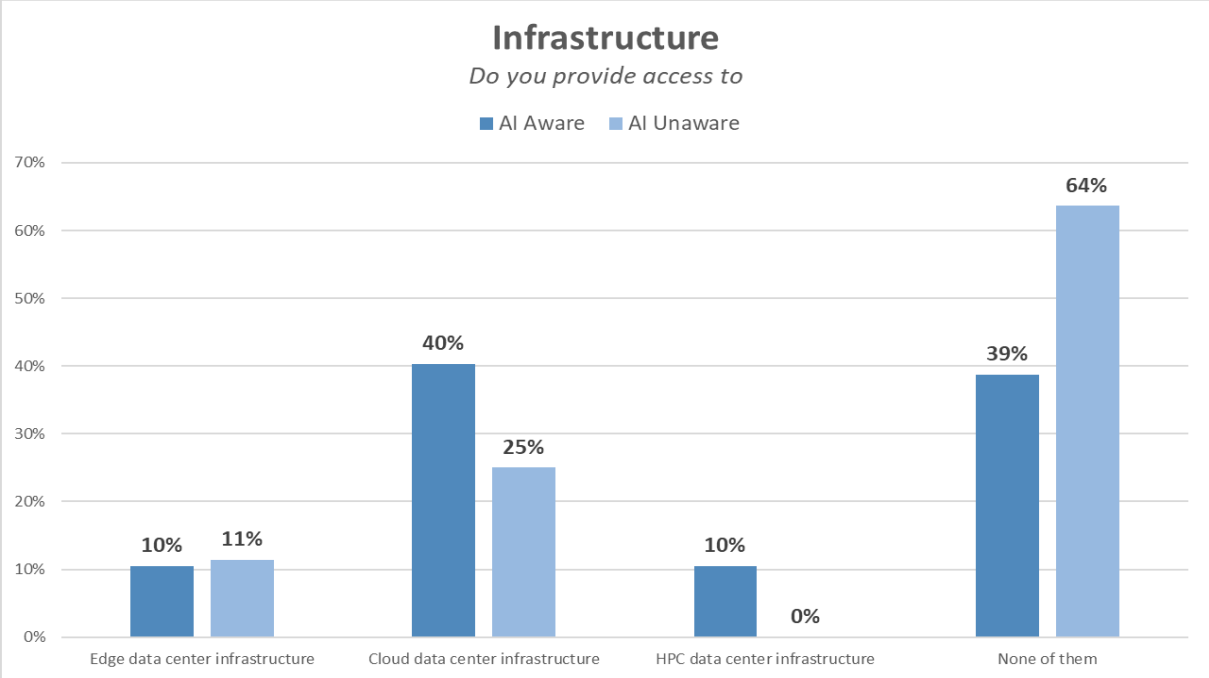
It comes out that only HUBCAP and DIH4CPS portals can manage all the main four types of network users, as the AI REGIO, DIH4AI and DIH4INDUSTRY platforms are mainly addressed to the community DIHs as collaborative tools. In addition, concerning the D-BEST dimensions supported, a couple of them (in the AI domain) are adding a further macro-class to the traditional ones. Then, the platforms are able to categorize and manage different assets (for example HUBCAP is providing MBD models and tools and AI REGIO provides a direct link with the IoT Catalogue [26]), and DIH4CPS is potentially able to add them to its catalogue. Finally, concerning the marketplace, only the HUBCAP and DIH4CPS platforms offer assets to SMEs, all of them to a

specific network of DIHs and only DIH4CPS and DIH4INDUSTRY proved to have potentialities for triggering synergies among different networks of DIHs, respectively as marketplace and showcase.

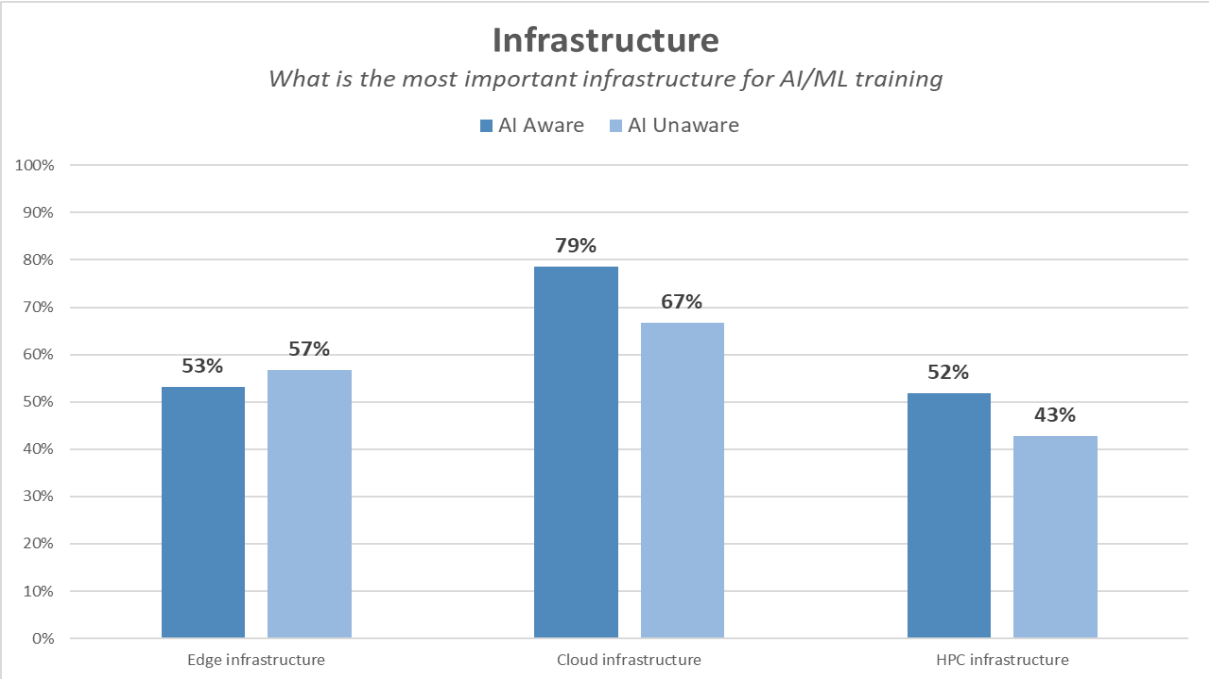
10.4 HPC, Cloud and edge

10.4.1 Requirements

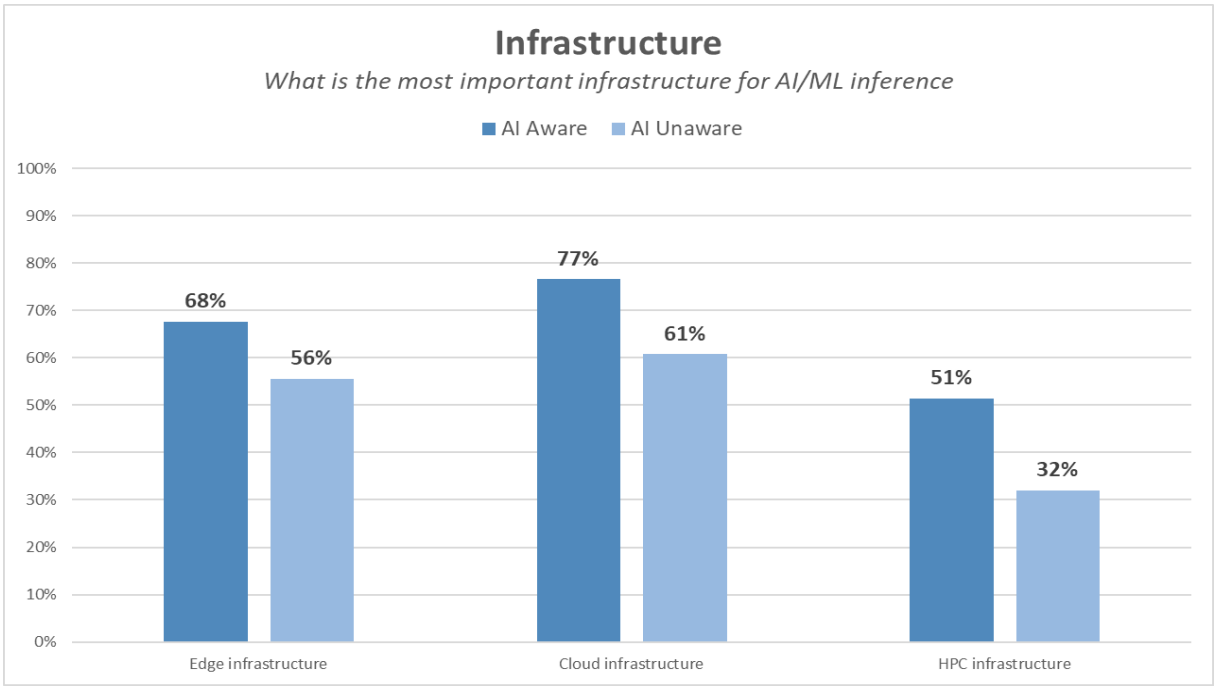
10.4.1.1 SMEs and large industries



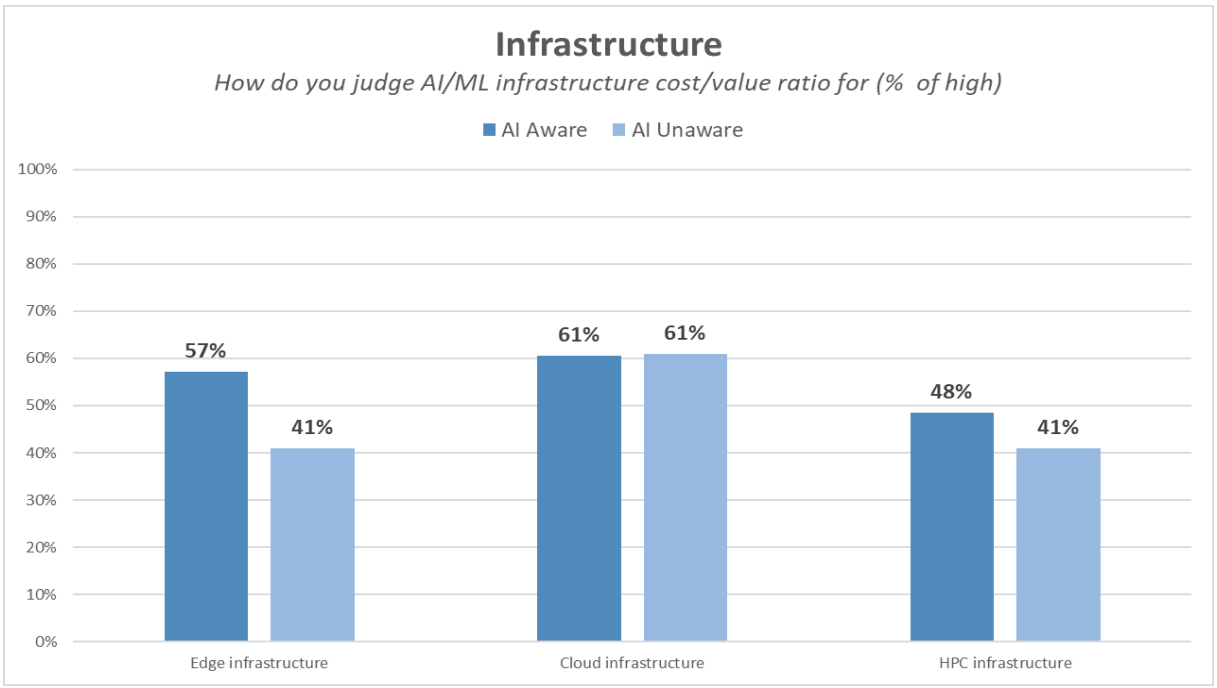
A larger part of the AI aware respondents from industry provide access to cloud datacenters. They have the higher adoption rate compared to Edge and HPC also among the AI unaware respondents. A relatively small proportion of the participants provide access to Edge and HPC infrastructure for different reasons that will be further analyzed in this section.



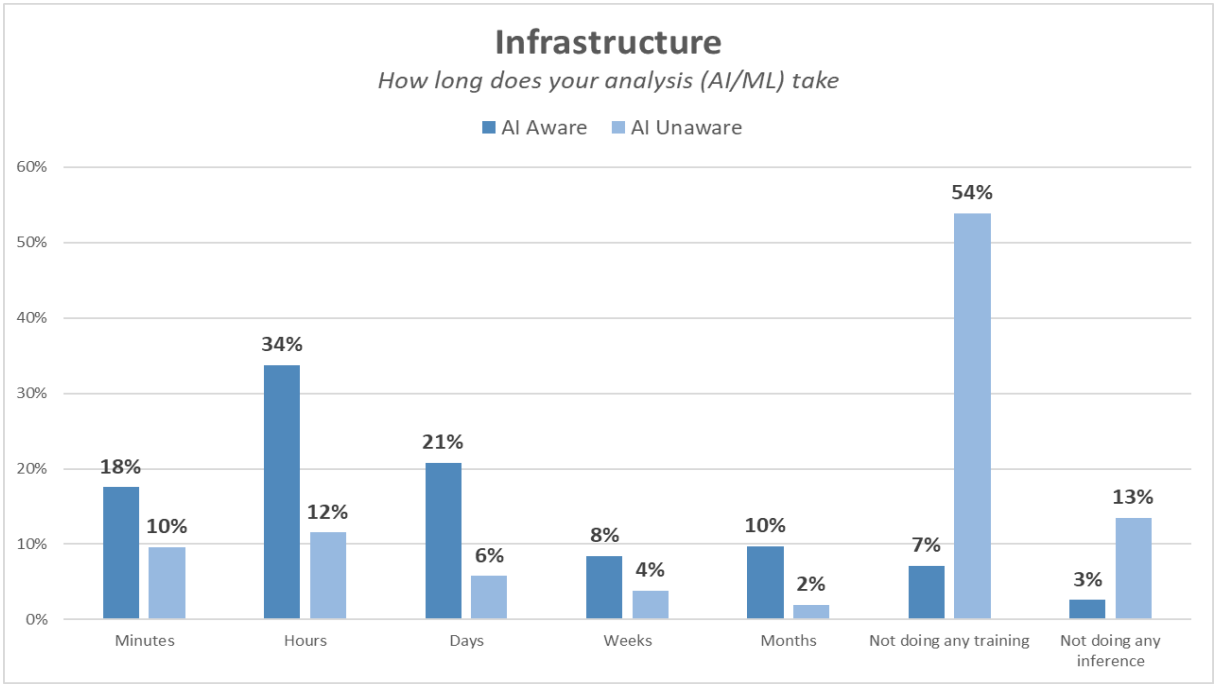
Cloud infrastructure is considered the most important for AI/ML training followed by Edge infrastructure and HPC infrastructure. It is a bit unexpected that Edge infrastructure is perceived to be important for training by more than 50% of the respondents. One plausible explanation may be that privacy issues are a motivating factor since keeping raw data close in Edge datacenters could improve privacy and security issues. Federated, split or distributed training is gaining traction as a privacy preserving mechanism for training over data residing in multiple distributed datacenters and this could also give rise to increasing importance for training on Edge datacenters.



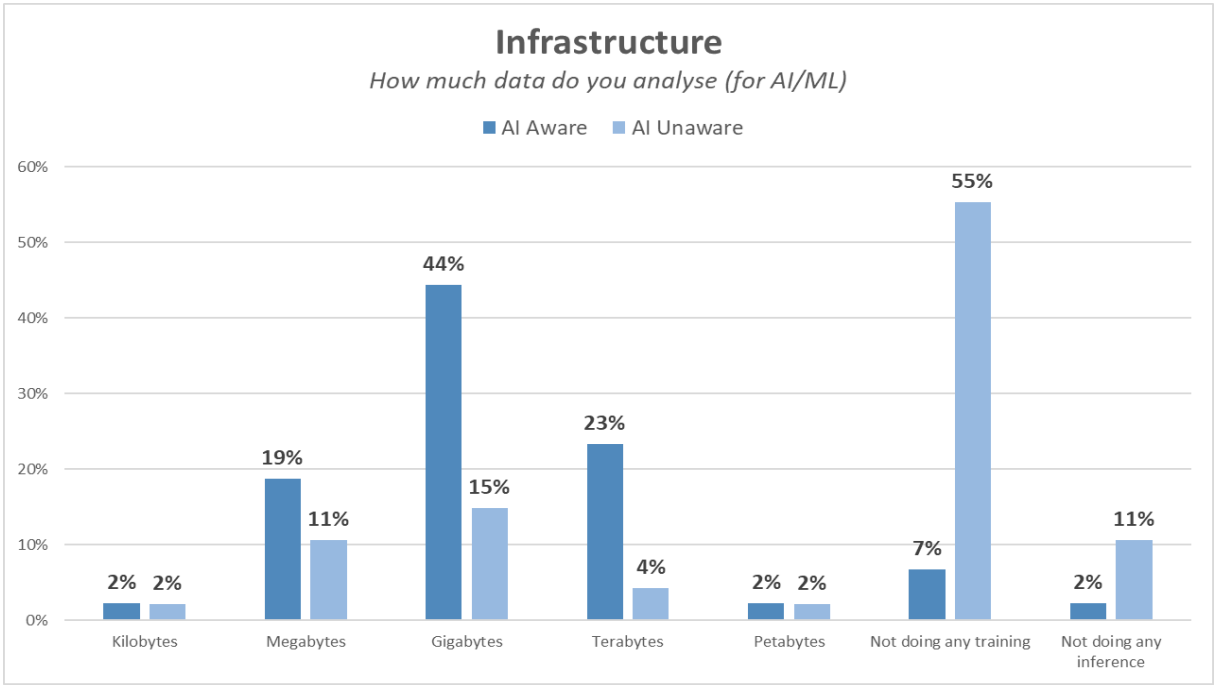
Not surprisingly, cloud infrastructure is considered the most important for AI/ML inference. The perceived importance of infrastructure for inference is higher among the AI aware than the AI unaware, which is as expected. Both AI aware and AI unaware prioritize cloud infrastructure for AI/ML inference. However, as expected, Edge infrastructure receives significant importance while HPC infrastructure has relatively less emphasis.



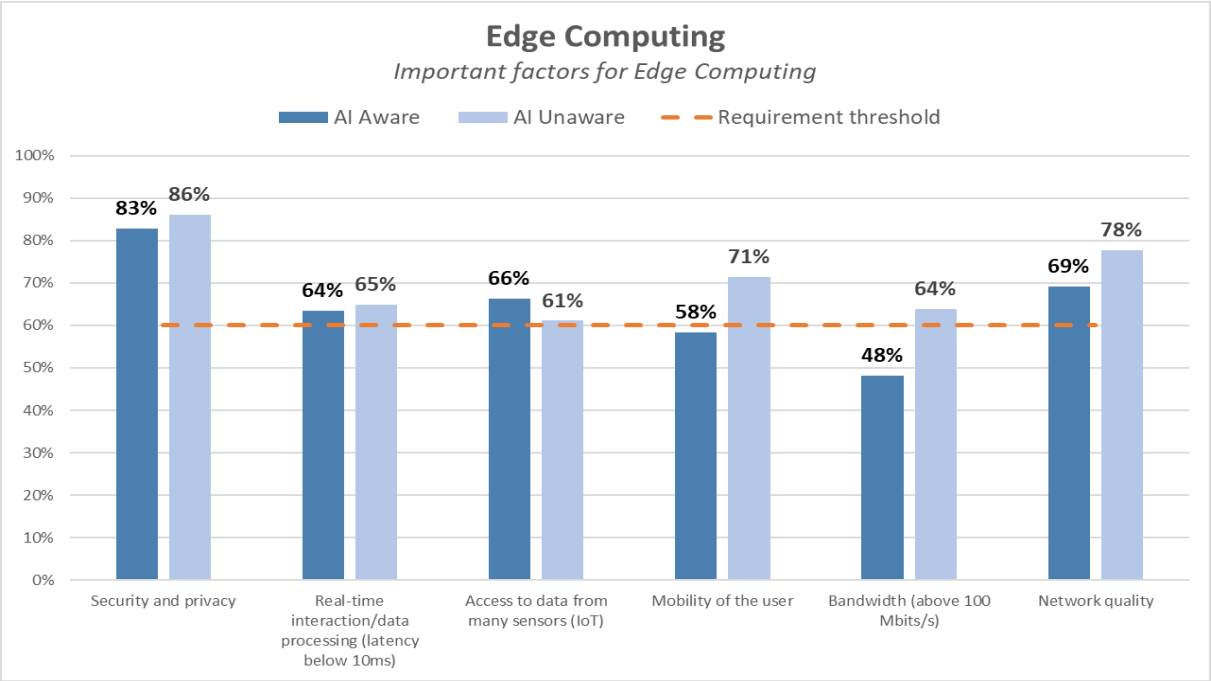
The respondents judge the cost of infrastructures as relatively high compared to the value of the different offers. This question is important with regard to the recommendation on how to provide infrastructure in the AIoD platform and should be explored further.



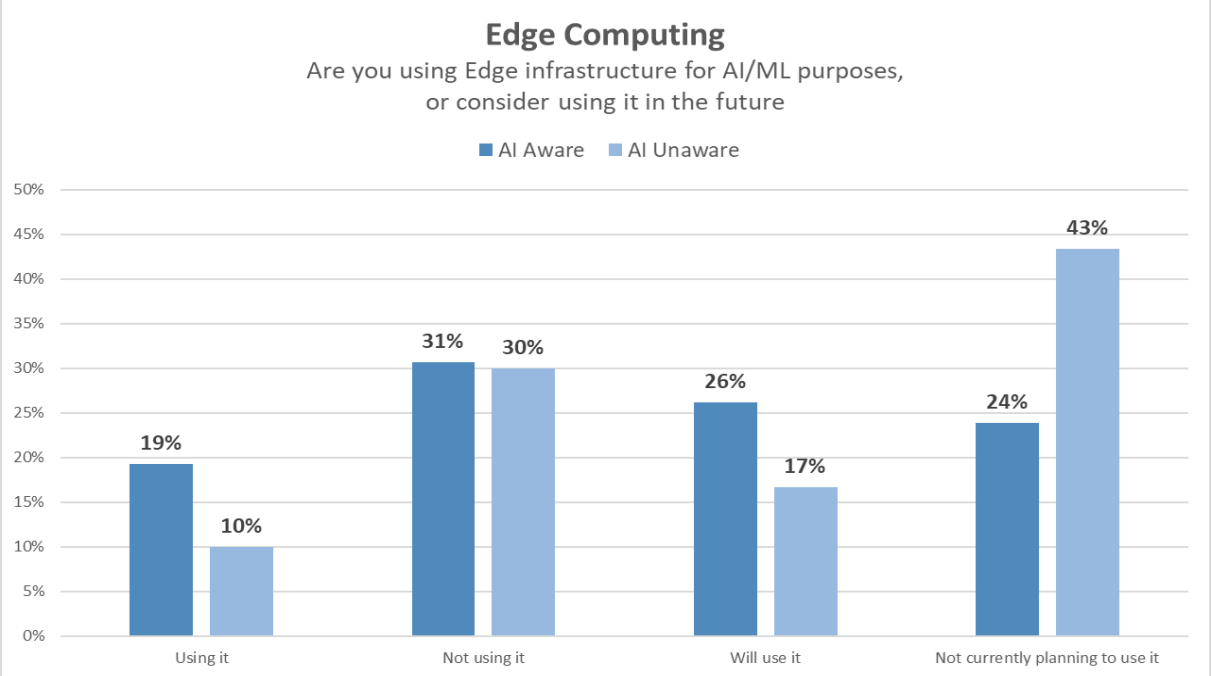
A large portion of the AI unaware respondents do not train AI/ML models at all. Training sessions that have a duration exceeding days are rare. However, the appearance of responses in the weeks and months categories among AI aware respondents suggest that certain users could potentially benefit from accessing higher-performing infrastructures to run their AI/ML analyses.



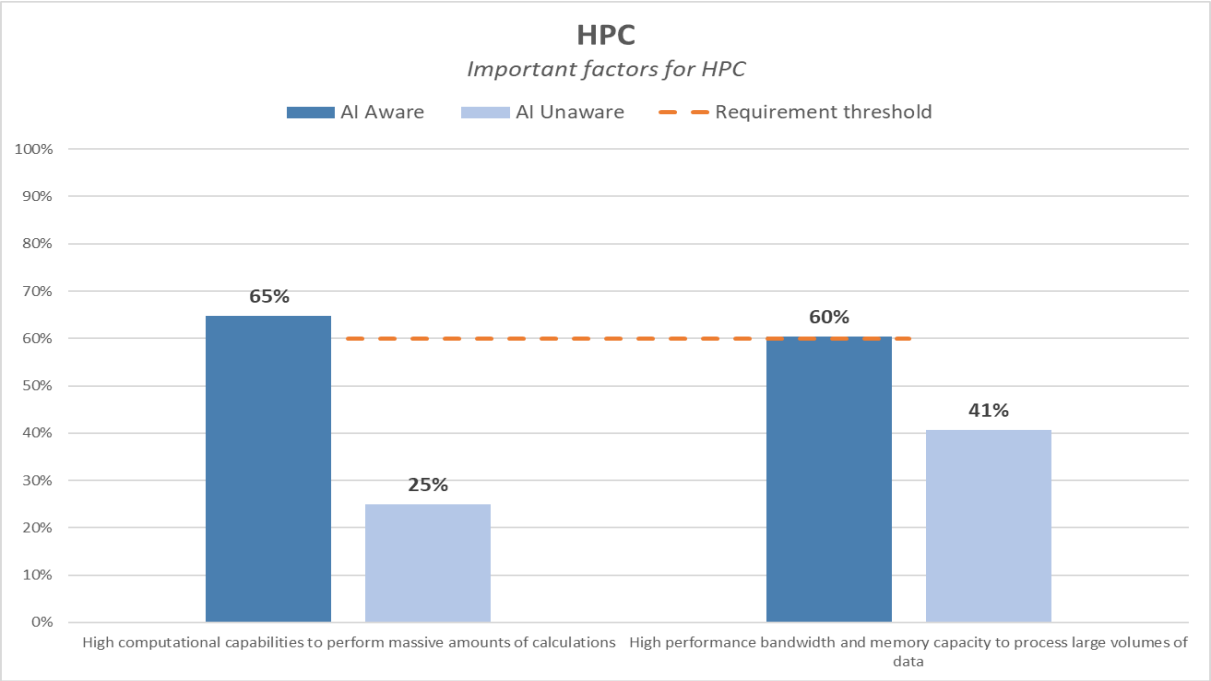
Most of the AI aware respondents analyze data in the Gigabytes range and data analyses where data exceeding the size of Terabytes are currently rare among the respondents.



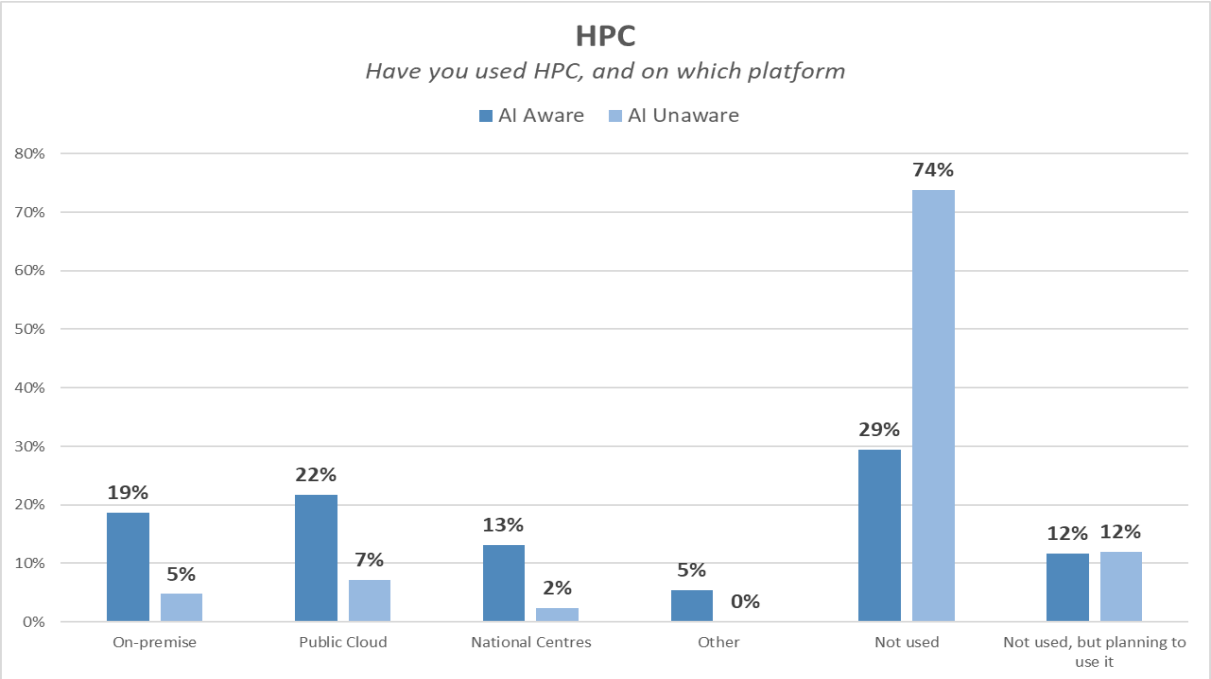
The most important factor for using Edge Computing among both AI aware and unaware respondents is Security and Privacy.



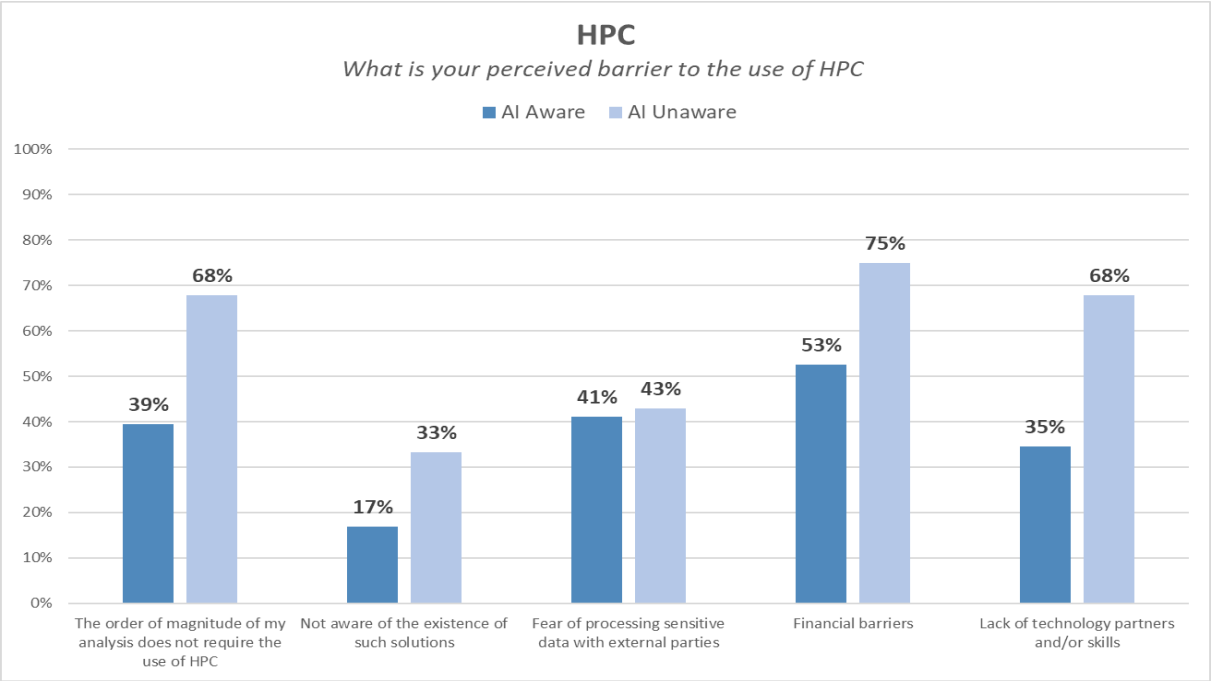
73% of AI unaware respondents are not using or planning to use Edge Computing while 45% of AI aware respondents are already using or plan to use Edge computing.



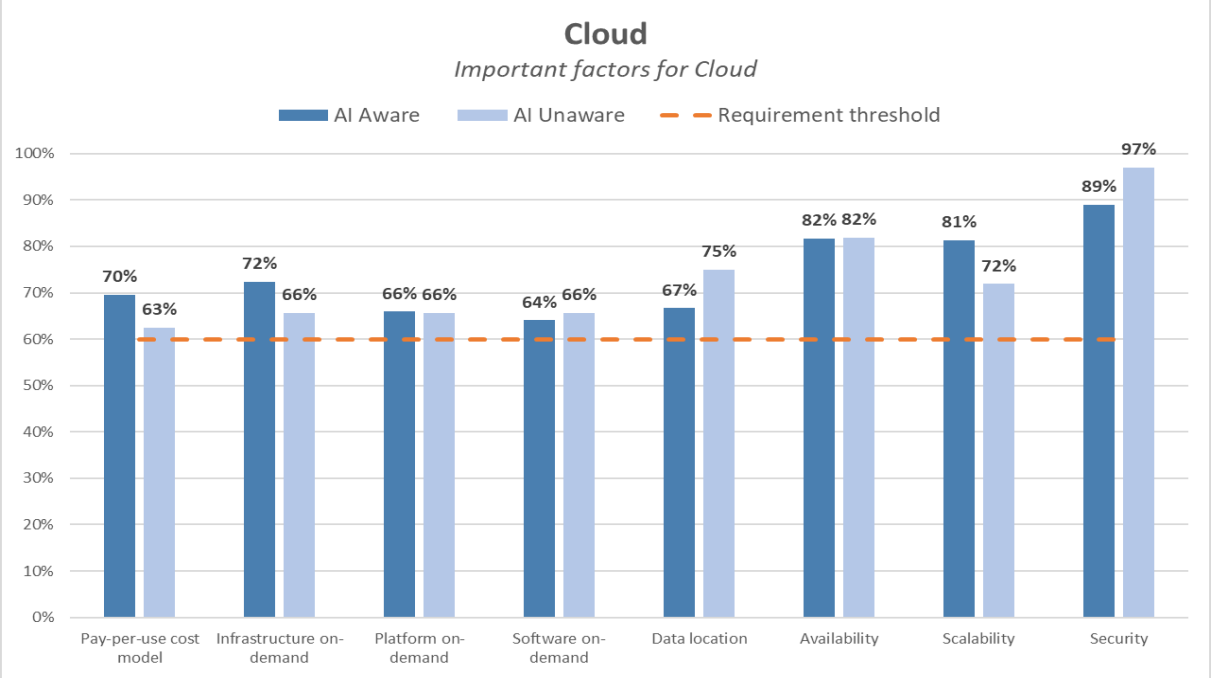
AI aware respondents view massive amounts of calculations as well as high performance bandwidth and memory capacity to process large volumes of data as important factors for using HPC.



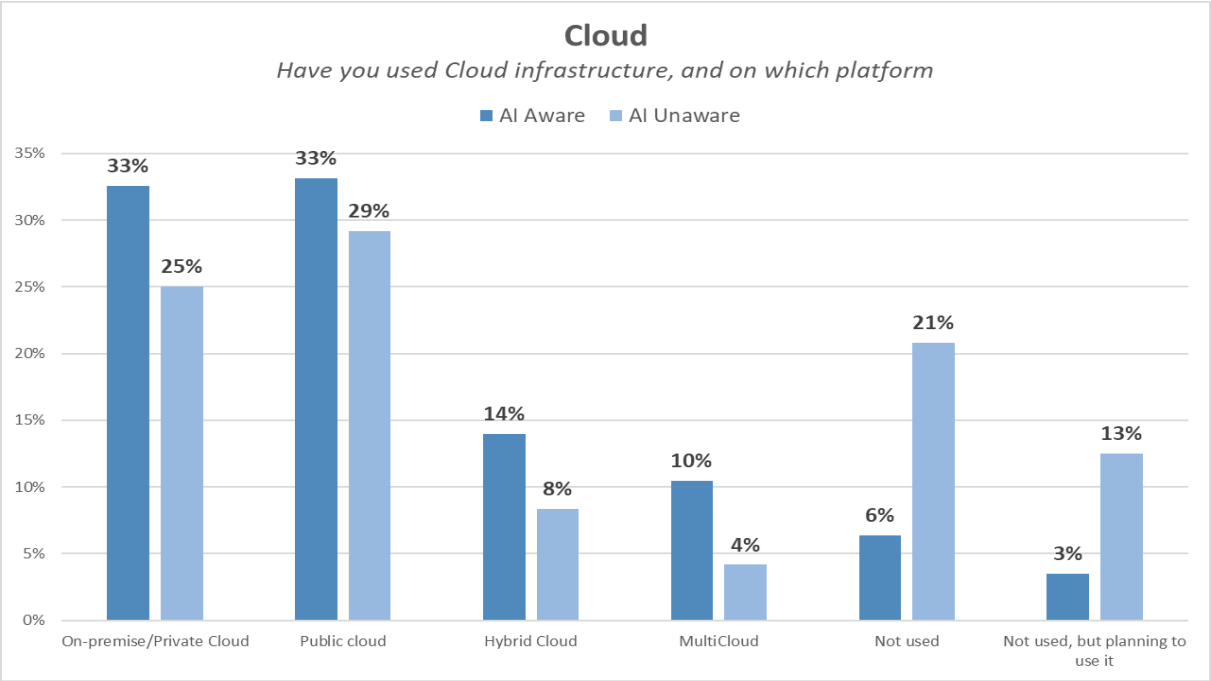
A large portion of AI unaware respondents have not used HPC and only a few of the AI aware respondents are using HPC infrastructure provided by national centers. A larger portion of AI aware respondents have used HPC compared to AI unaware and a small portion of both groups are planning to use it, potentially indicating an emerging interest in leveraging HPC for AI related purposes.



The most important barrier to use HPC is financial barriers for both AI aware and unaware respondents. Additionally, AI aware respondents express concerns about processing sensitive data with external parties, confirming the importance of security and privacy factors for SME and large Industries. Conversely, AI unaware respondents lack, to the same extent, both analysis that justifies the use of HPC and technology partners and skills.

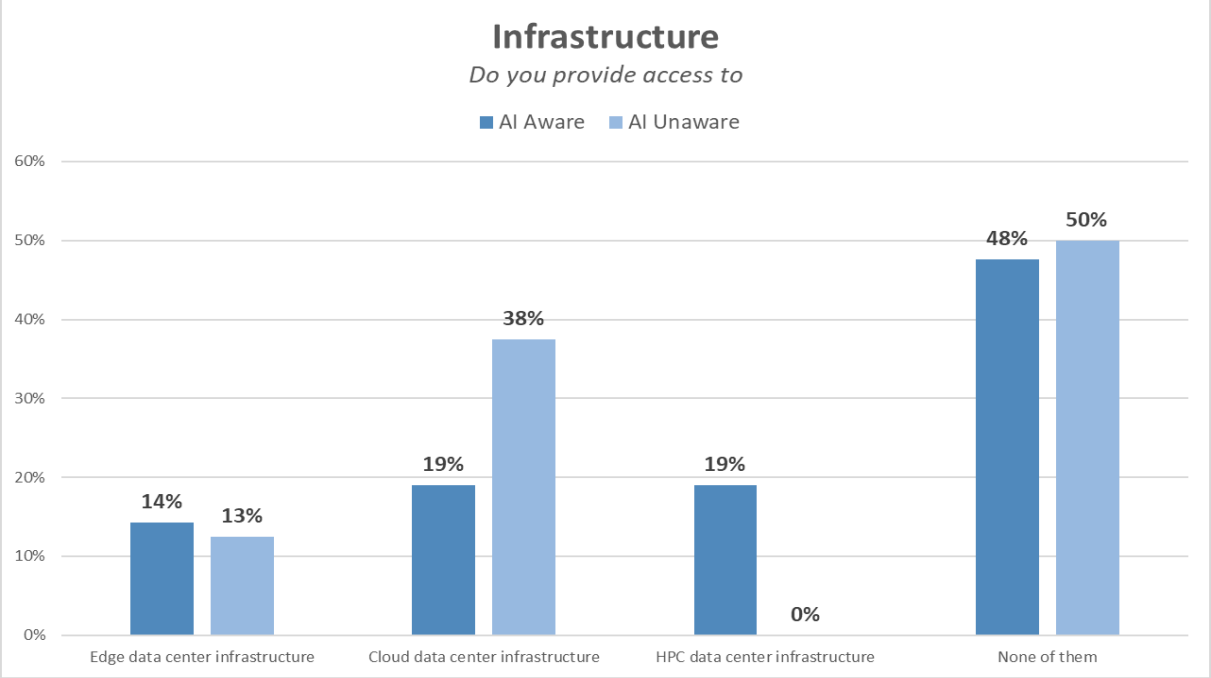


The most important factor to use Cloud is security for both AI aware and unaware respondents.

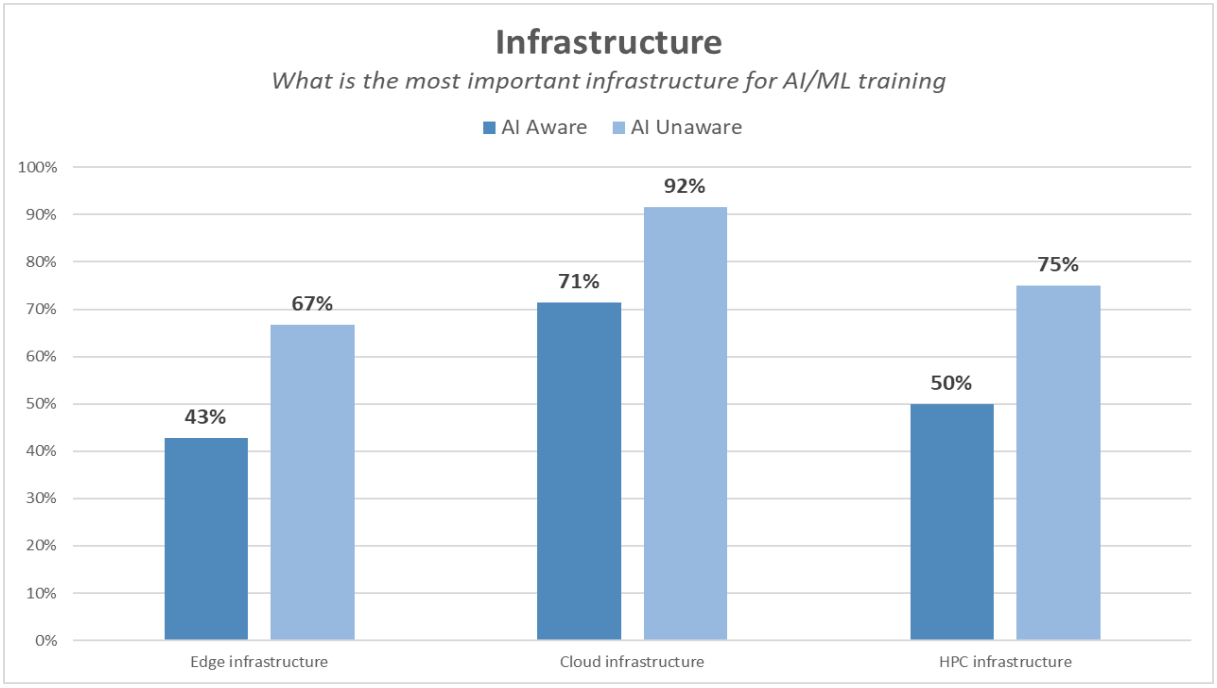


Cloud infrastructure is widely used and very few AI aware respondents have not used Cloud infrastructure served either by On-premise/Private Cloud, Hybrid Cloud or MultiCloud offerings at all. Surprisingly, despite being infrastructure ready, a considerable portion of the AI unaware respondents have not utilized cloud infrastructure, and only a few of them have plans to use it in the future.

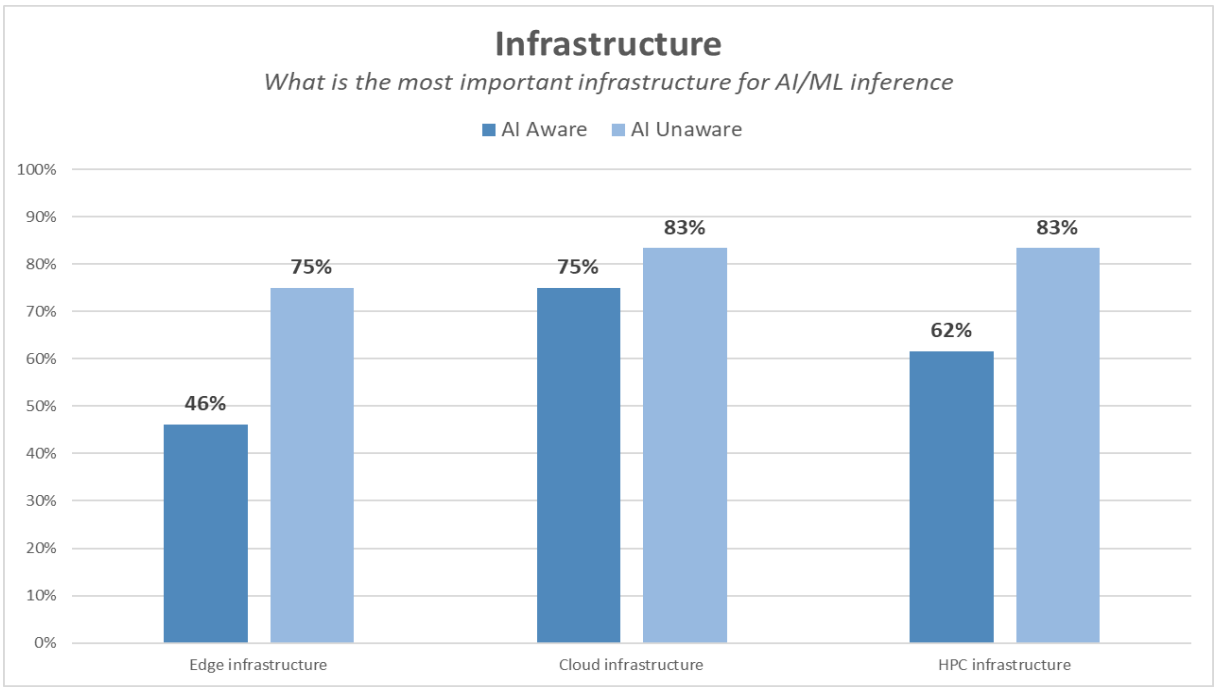
10.4.1.2 Public bodies



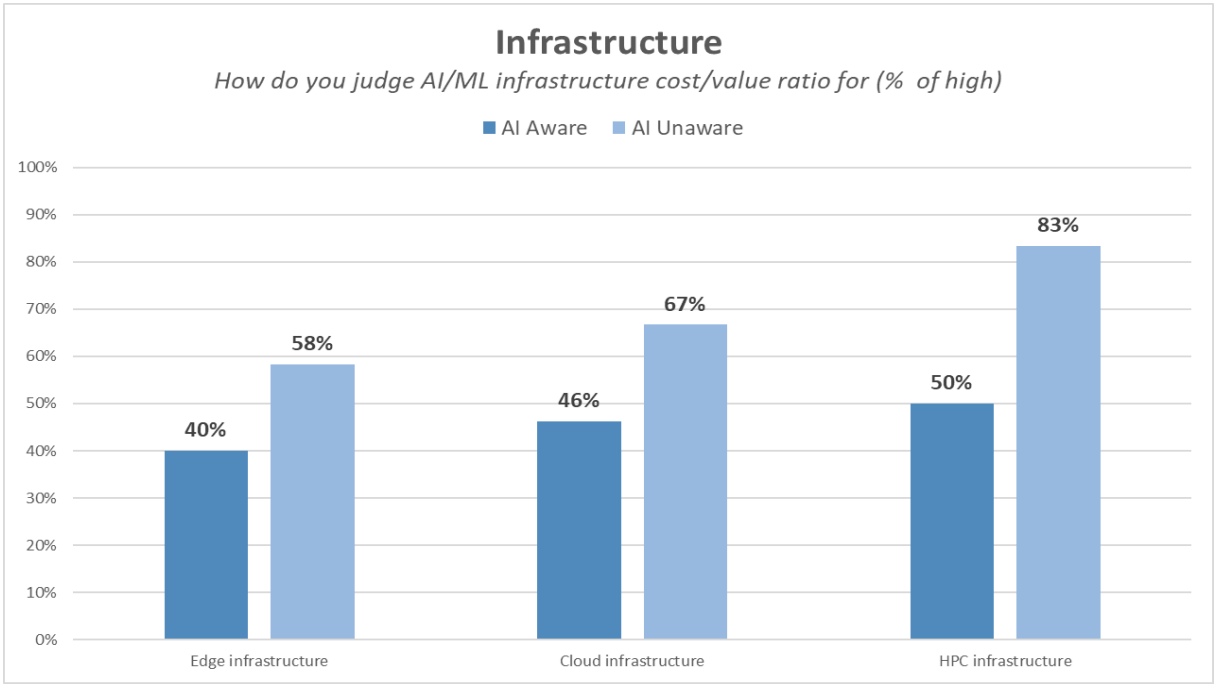
A larger part of the AI unaware respondents from public bodies provide access to cloud infrastructure compared to SME and large Industries (see previous figure in the SMEs and large Industries section). About half of both groups provide access to at least one infrastructure between Edge, Cloud and HPC, while the other half do not provide access to any infrastructure.



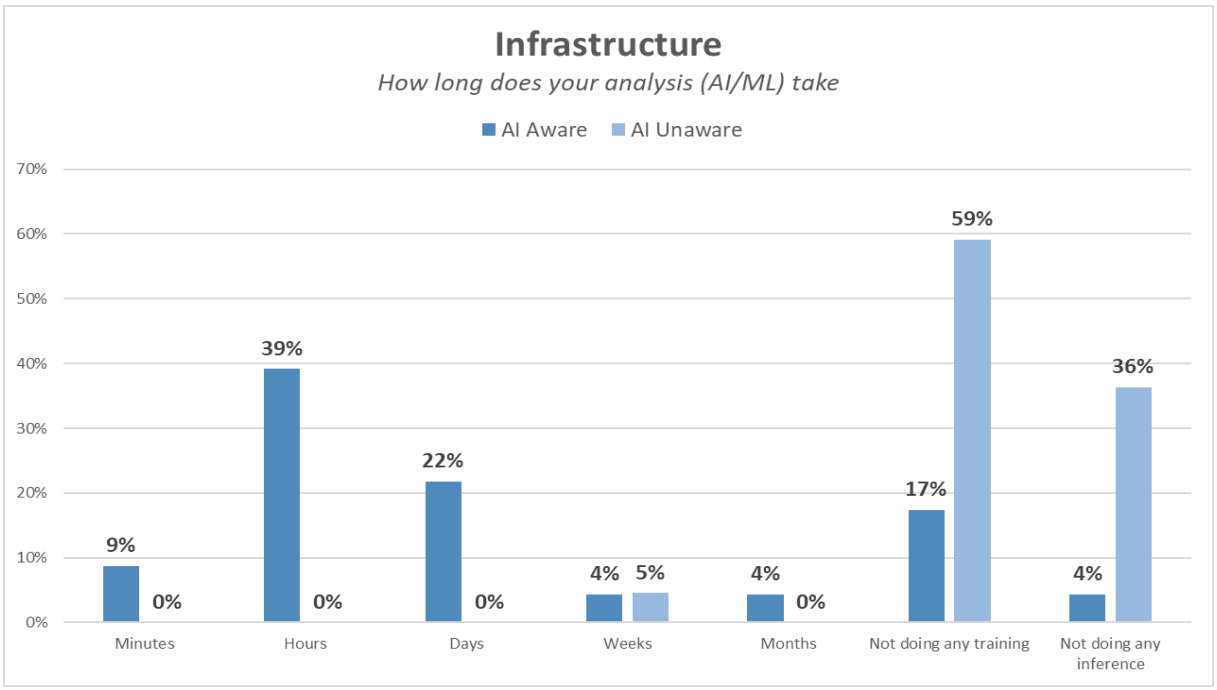
As for industry, public bodies consider Cloud the most important infrastructure for AI/ML training followed by HPC infrastructure and Edge infrastructure.



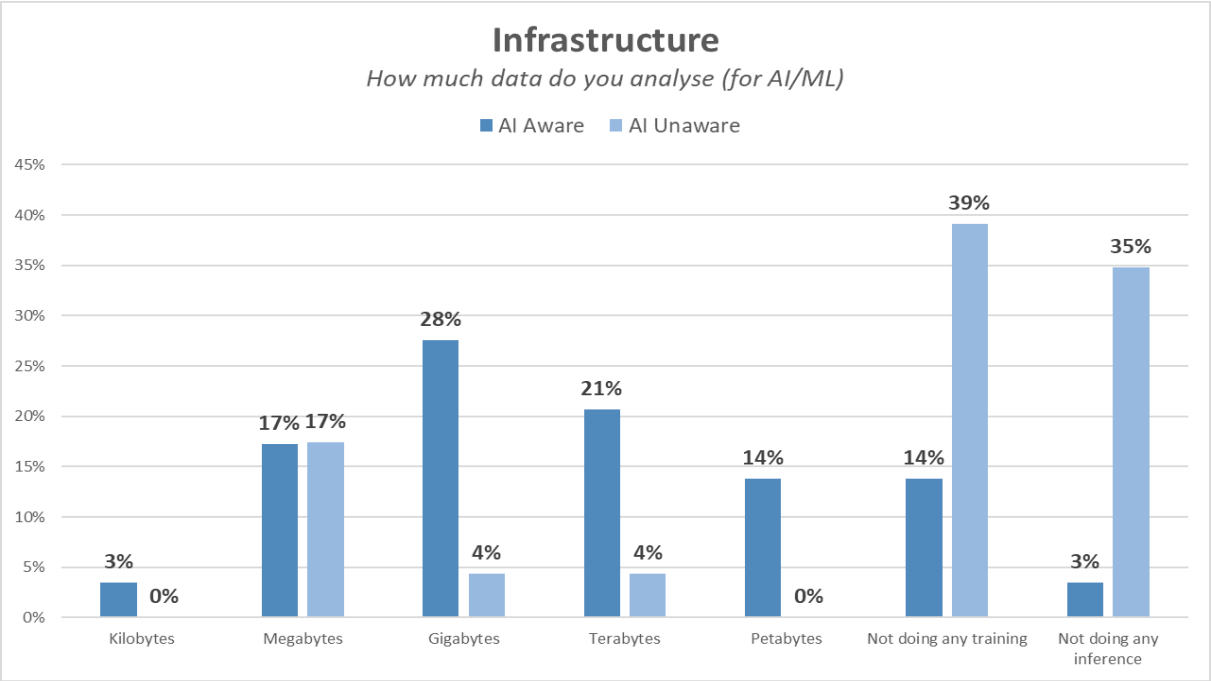
Public bodies consider Cloud the most important infrastructure for AI/ML inference followed by HPC and Edge infrastructure.



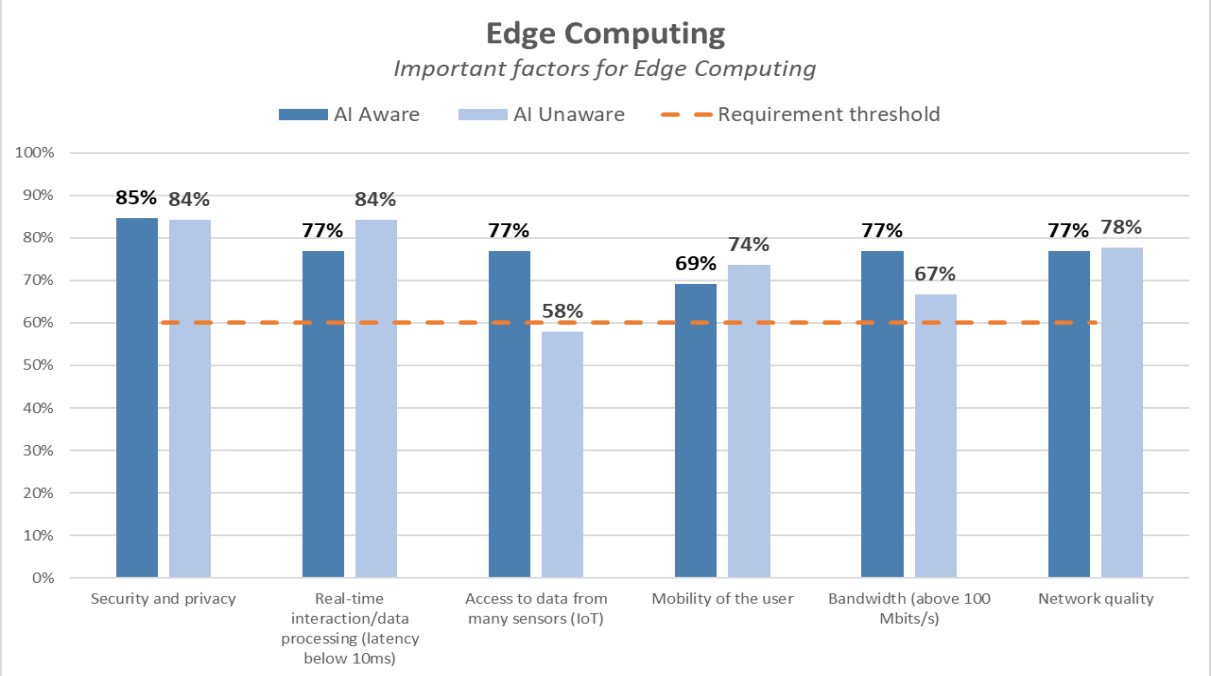
As for industry, public bodies also judge the cost of infrastructures as relatively high compared to the value from the different offers.



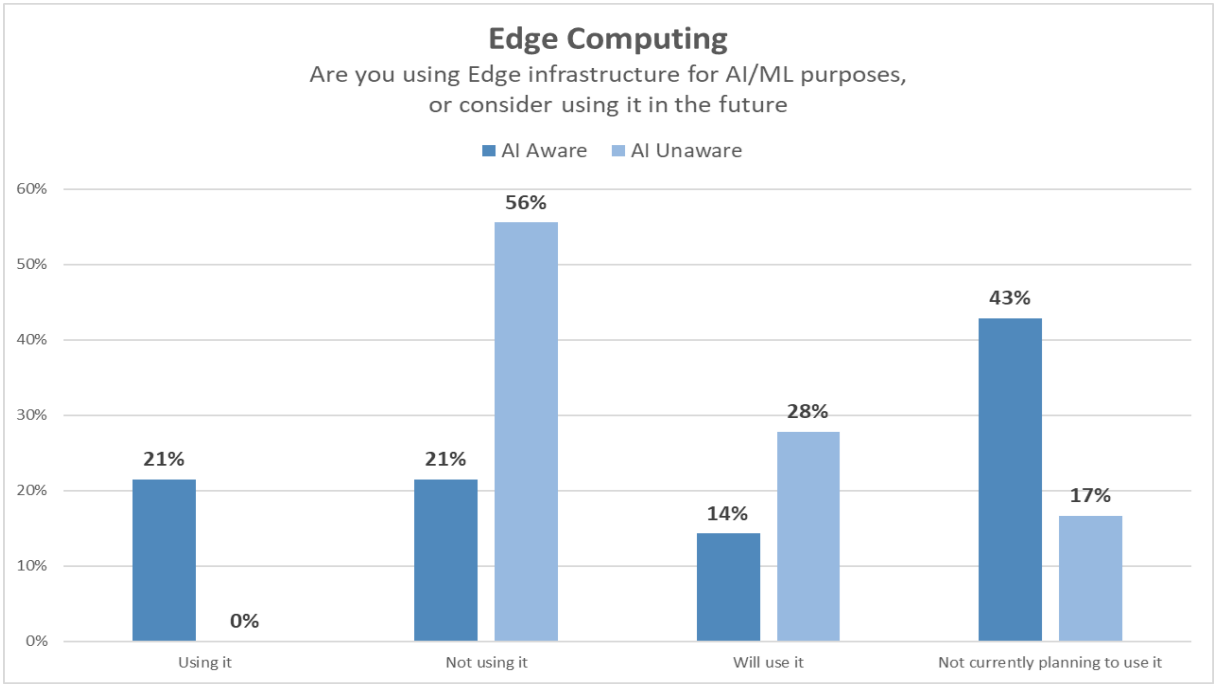
The majority of AI unaware respondents from public bodies do no training. In contrast, most of the AI aware respondents do training that typically takes hours.



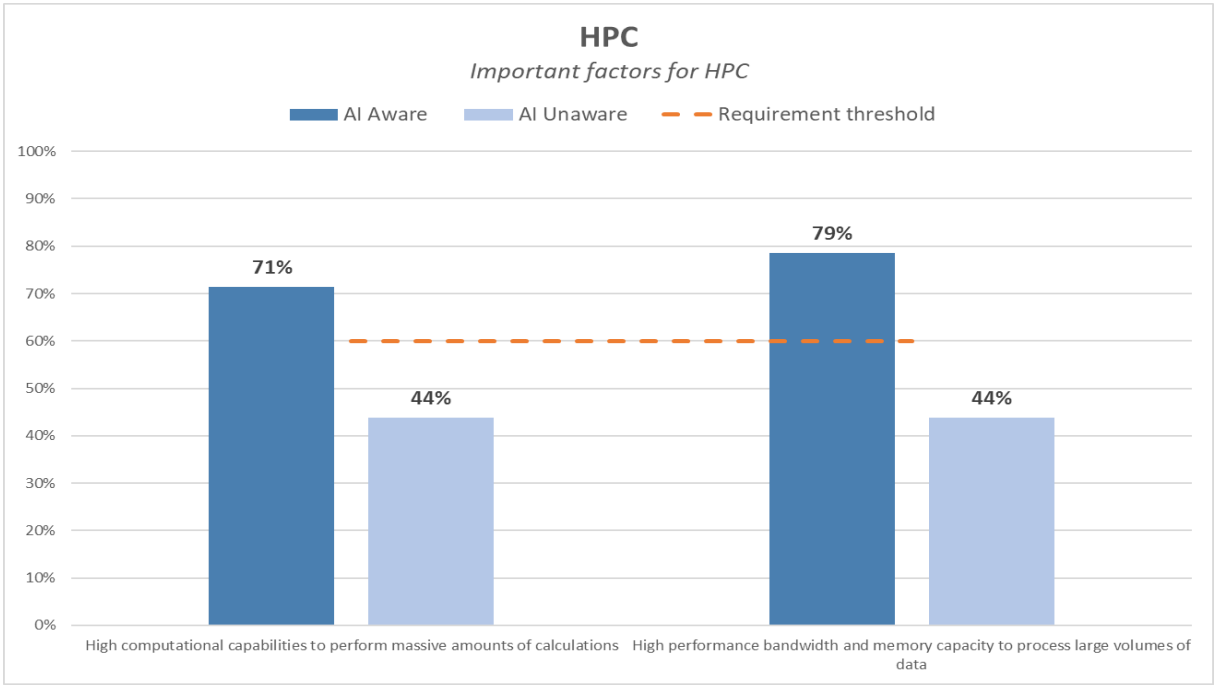
Most of the AI aware respondents analyze data in the Gigabytes range, but the portion of analyses performed on Petabyte sized data is larger for public bodies than it was for SME and large Industries.



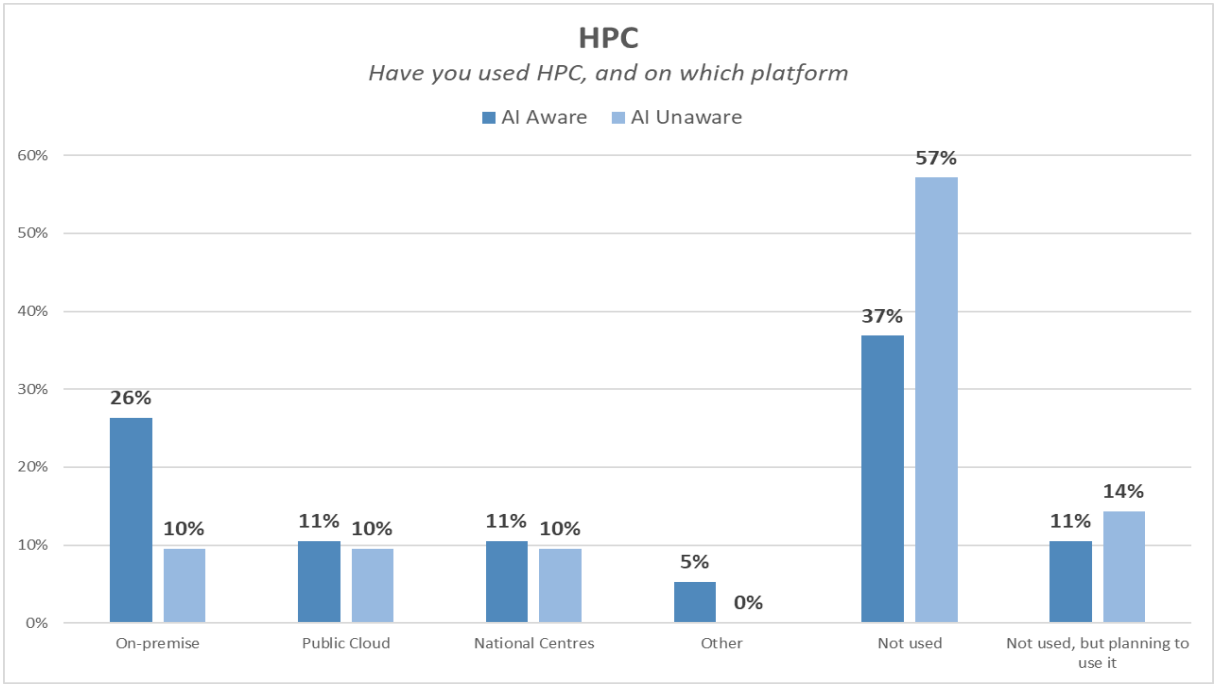
As for the industry, both AI aware and AI unaware respondents from public bodies consider security the most important factor for using Edge Computing.



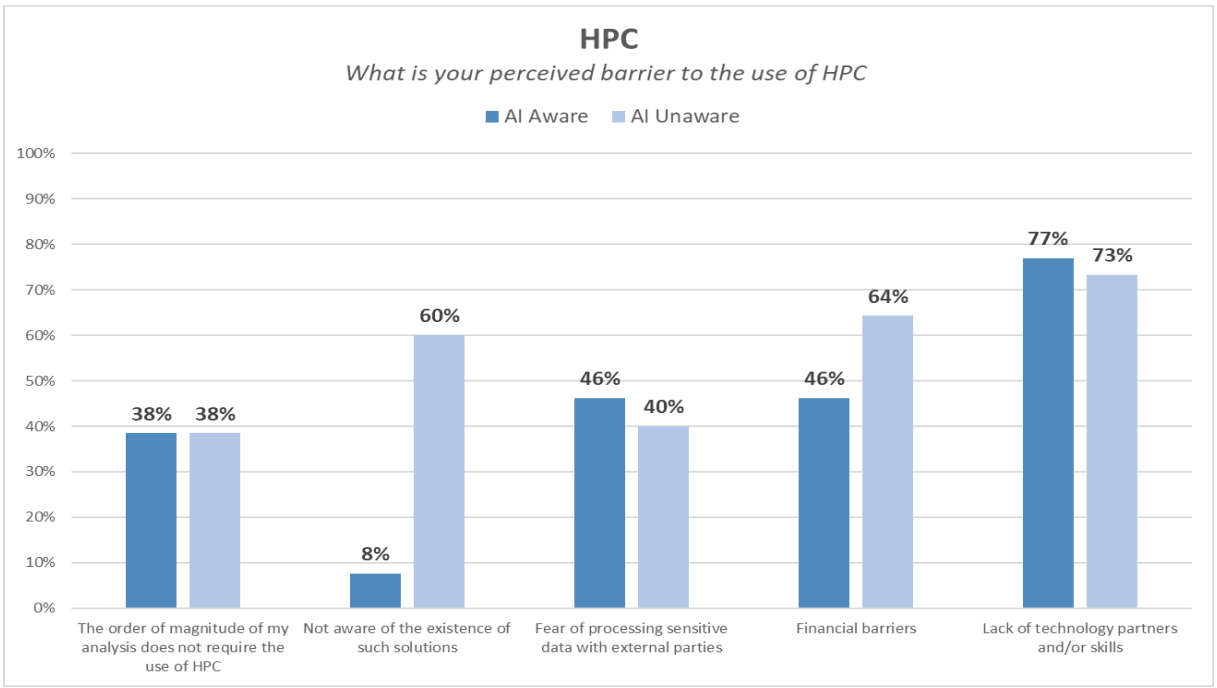
More than half of AI unaware respondents for public bodies are not using Edge Computing.



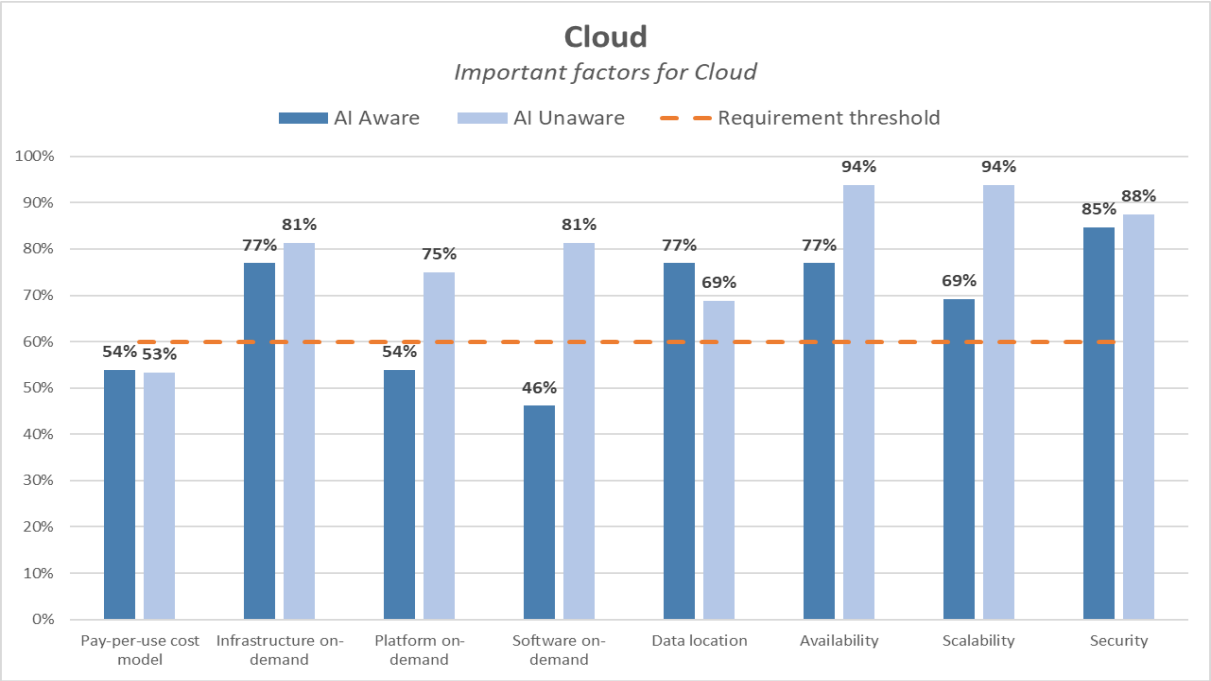
As for industry, AI aware respondents from public bodies view massive amounts of calculations as well as high performance bandwidth and memory capacity to process large volumes of data as important factors for using HPC.



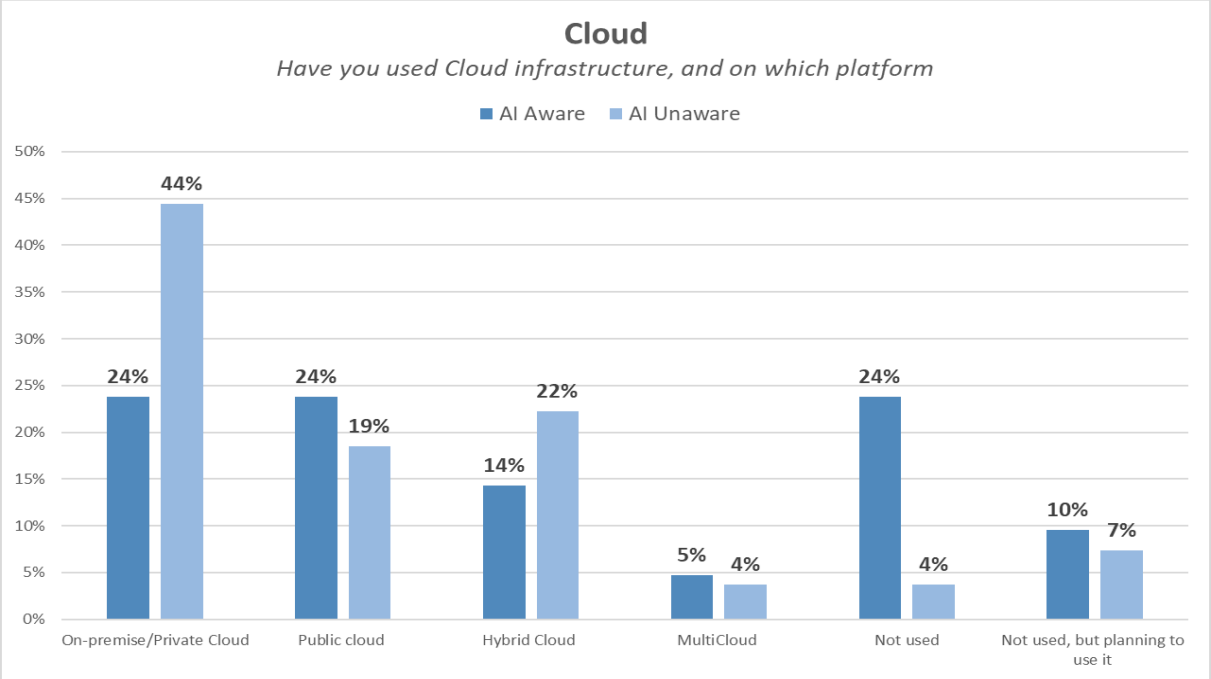
A large portion of AI unaware respondents from public bodies have not used HPC. In contrast, more of the AI aware respondents are taking advantage of it.



In contrast to industry, lack of technology partners and/or skills as opposed to financial barriers is the most important barrier to the use of HPC.

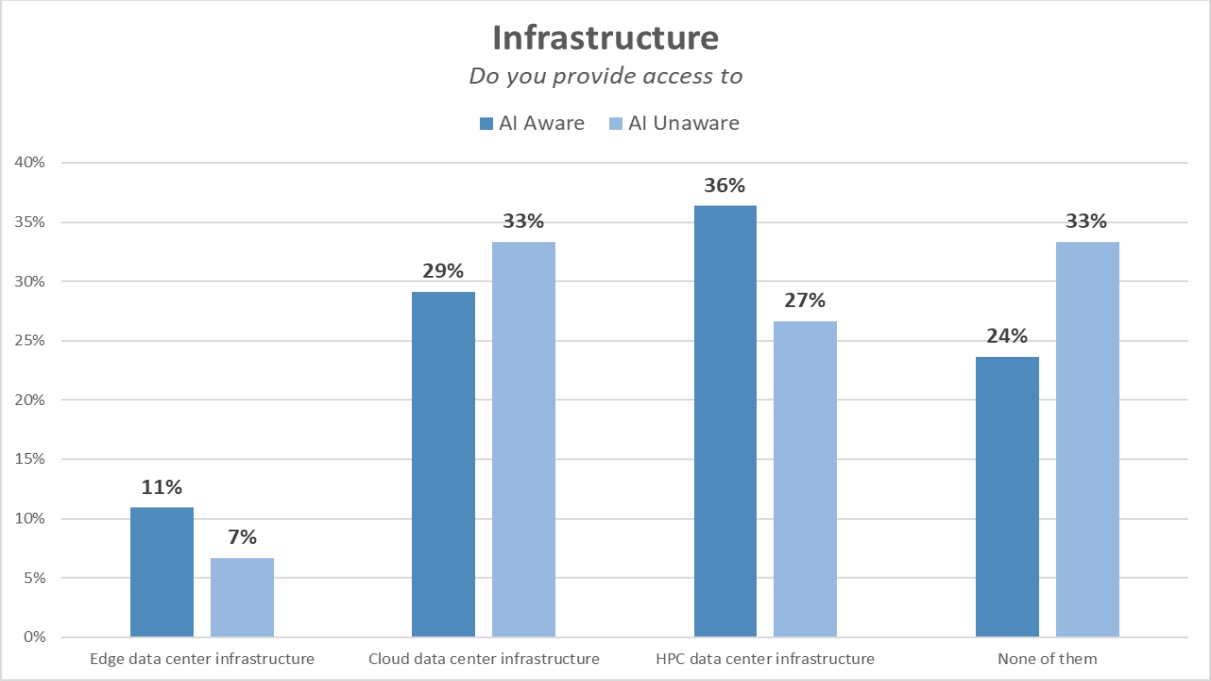


The difference between AI aware and AI unaware respondents seems to be larger than for industry. Similarly, for public bodies, availability, scalability, and security are also identified as the most important factors. Further, AI aware public bodies seem to be a bit more reluctant to PaaS and SaaS solutions than SMEs and large industries and DIHs.

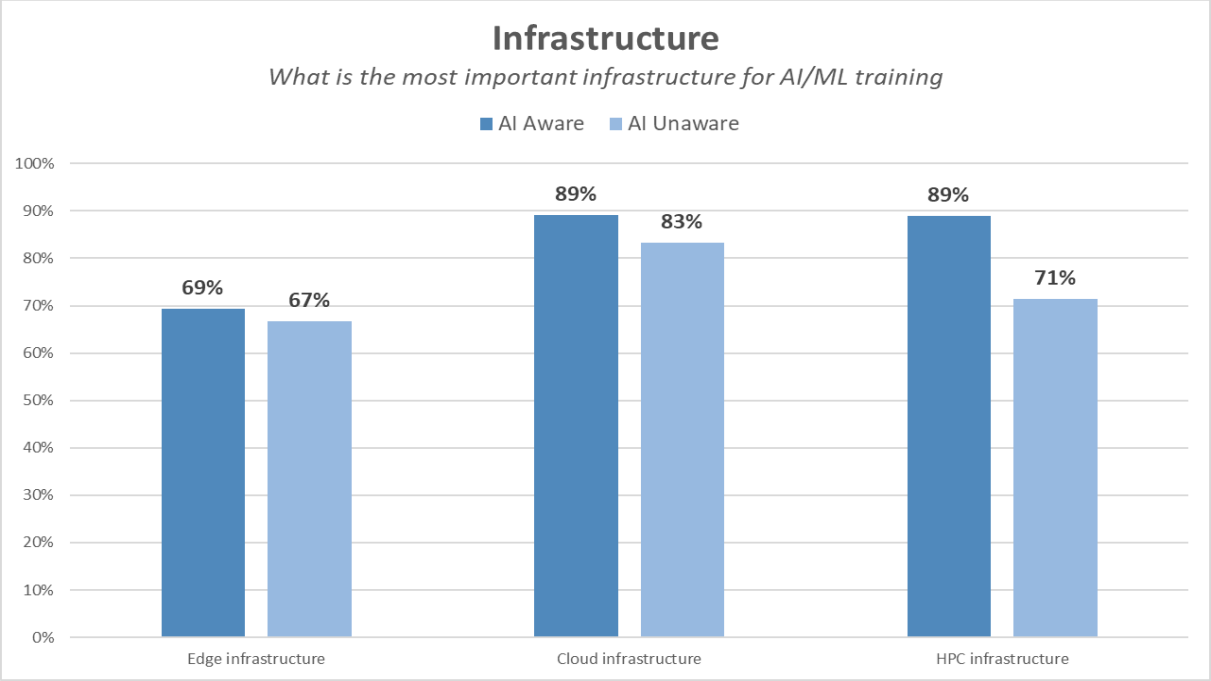


A considerable part of AI aware respondents has not used Cloud infrastructure, which is a bit unexpected. It could be that they are using dedicated on-prem infrastructure (laptops, servers) instead for privacy reasons or other valid reasons. Among those who have used cloud infrastructure, the on-premise/private cloud model is mainly used by AI unaware respondents, whereas AI aware respondents seem to more evenly distribute their usage between private and public cloud.

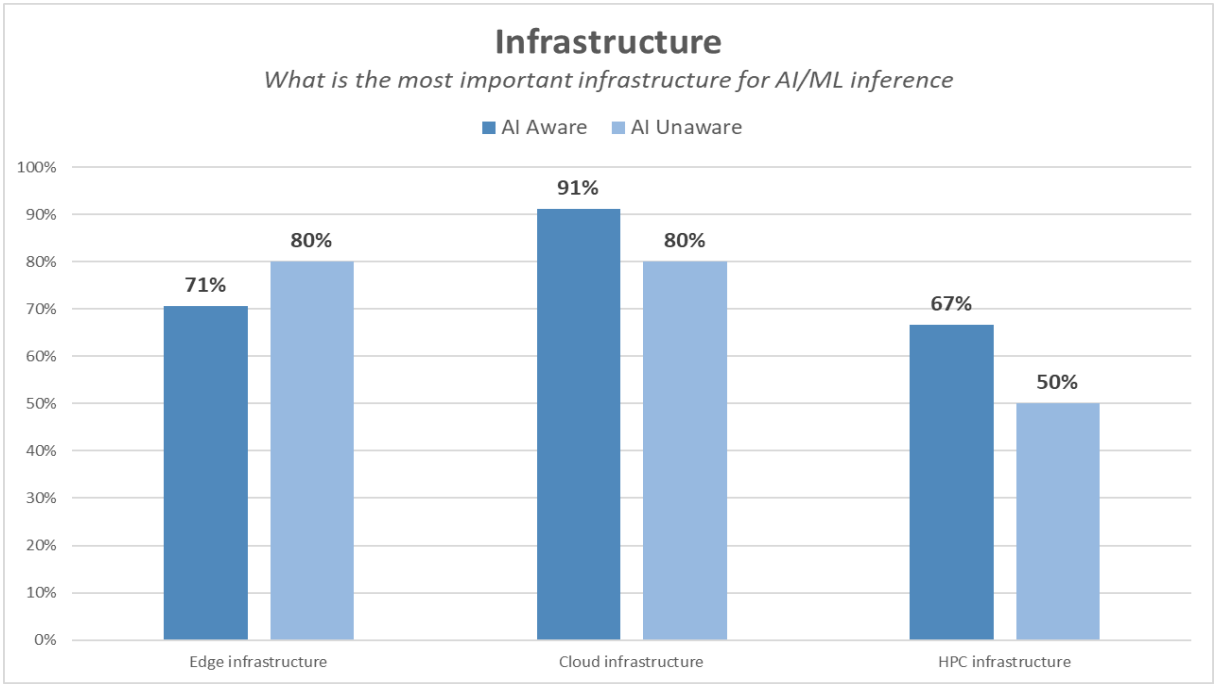
10.4.1.3 DIHs



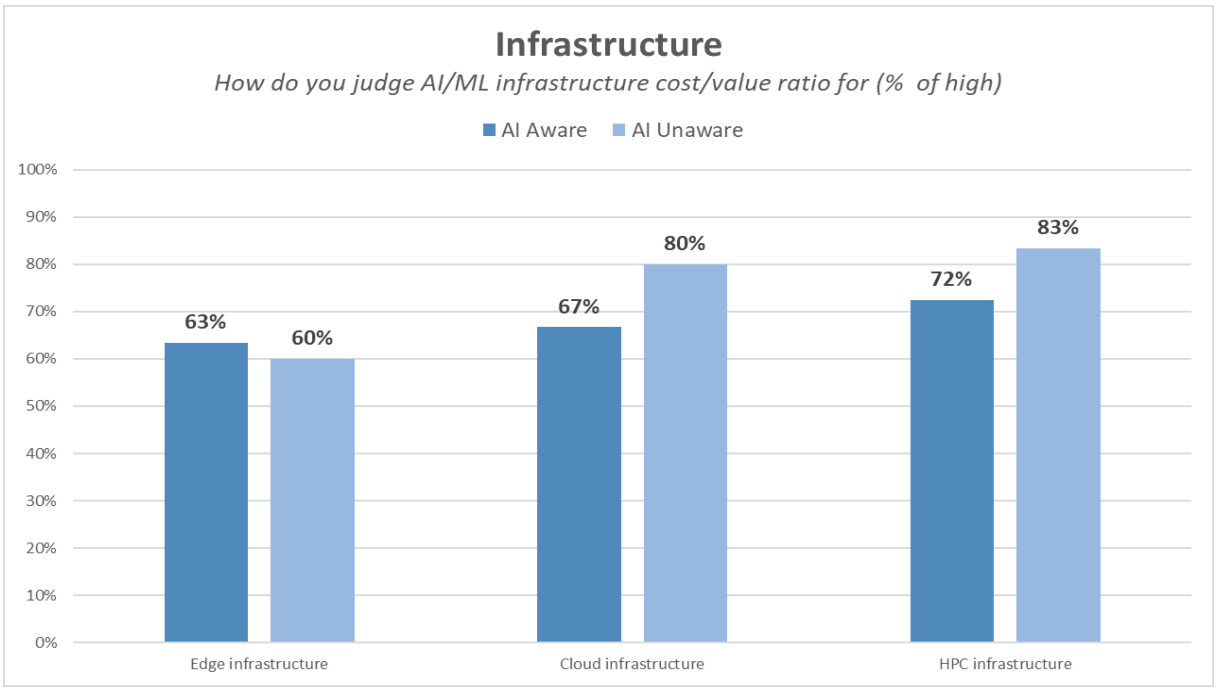
A larger part of the AI aware respondents from DIHs provide access to HPC infrastructure, while AI unaware respondents predominantly provide access to cloud infrastructure, aligning with pattern observed among the other stakeholders' groups.



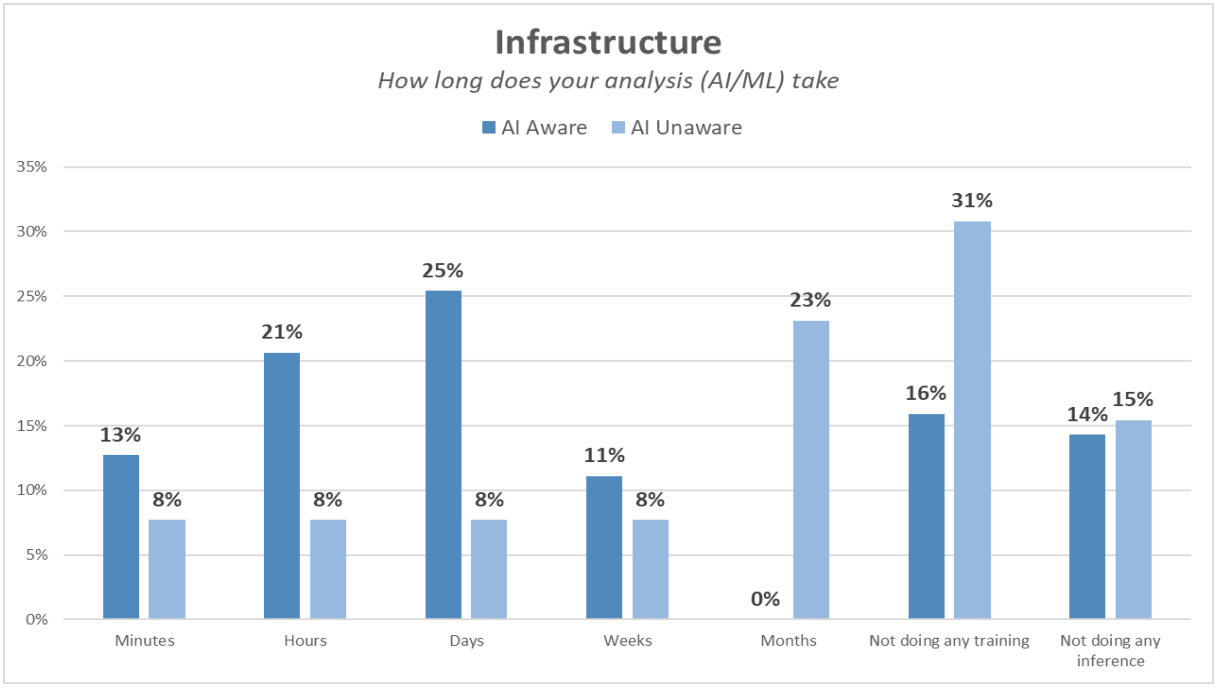
All types of compute centric infrastructures are considered important by DIH respondents for training, and by AI aware DIHs, HPC infrastructure is perceived to be of particular importance. The relatively high importance of Edge infrastructure is a bit surprising, but federated learning, split learning and distributed learning is becoming increasingly important due to privacy related issues, since sharing of raw data might be avoided when using such techniques.



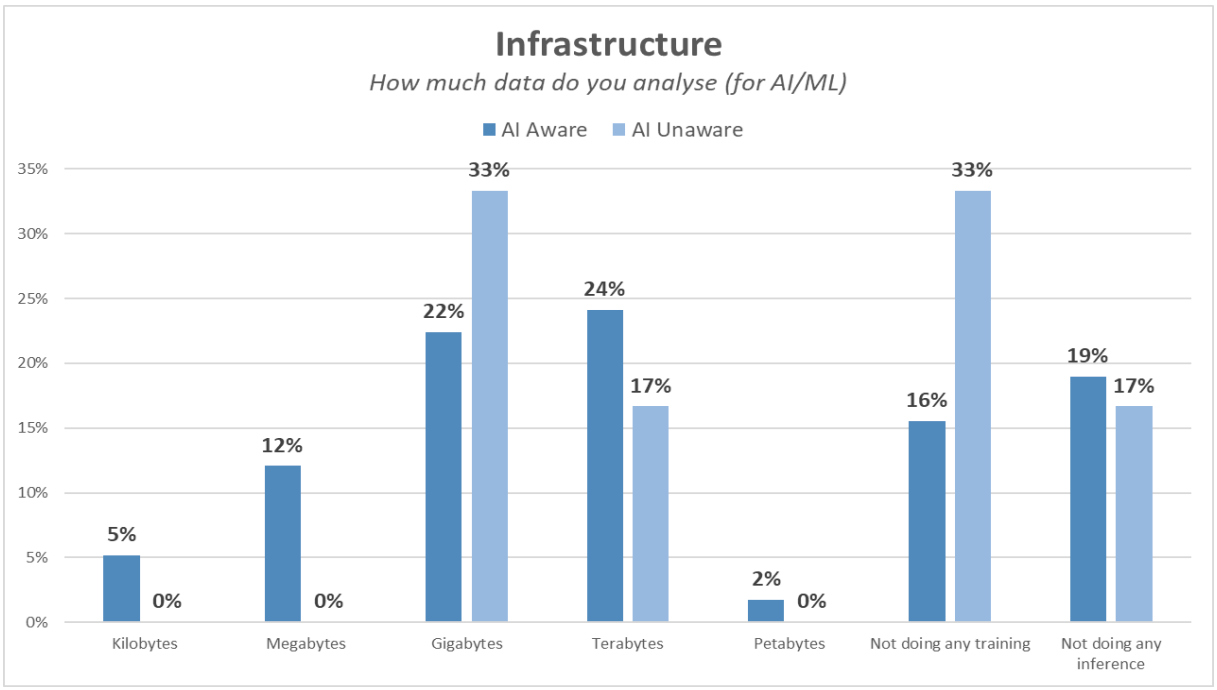
All types of compute centric infrastructures are considered important, and Cloud infrastructure in particular, for inference by AI aware DIHs.



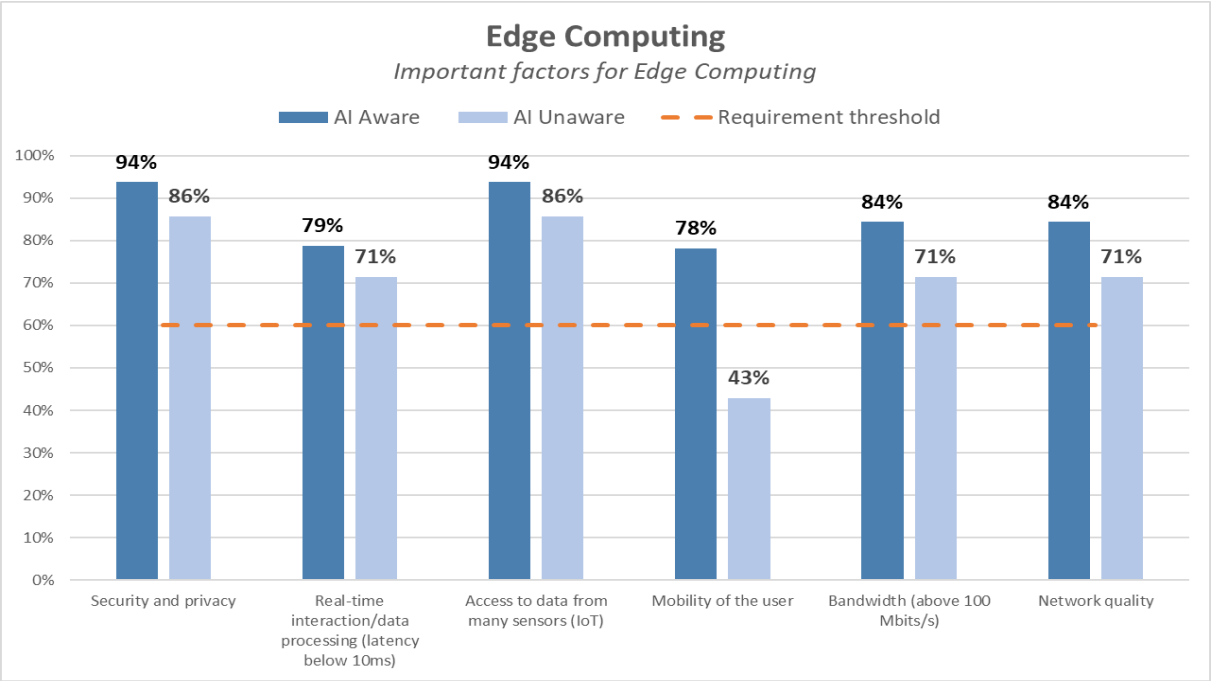
As for other respondent types, DIH respondents also perceive the cost relative to the value of the infrastructure to be high for all types of infrastructures.



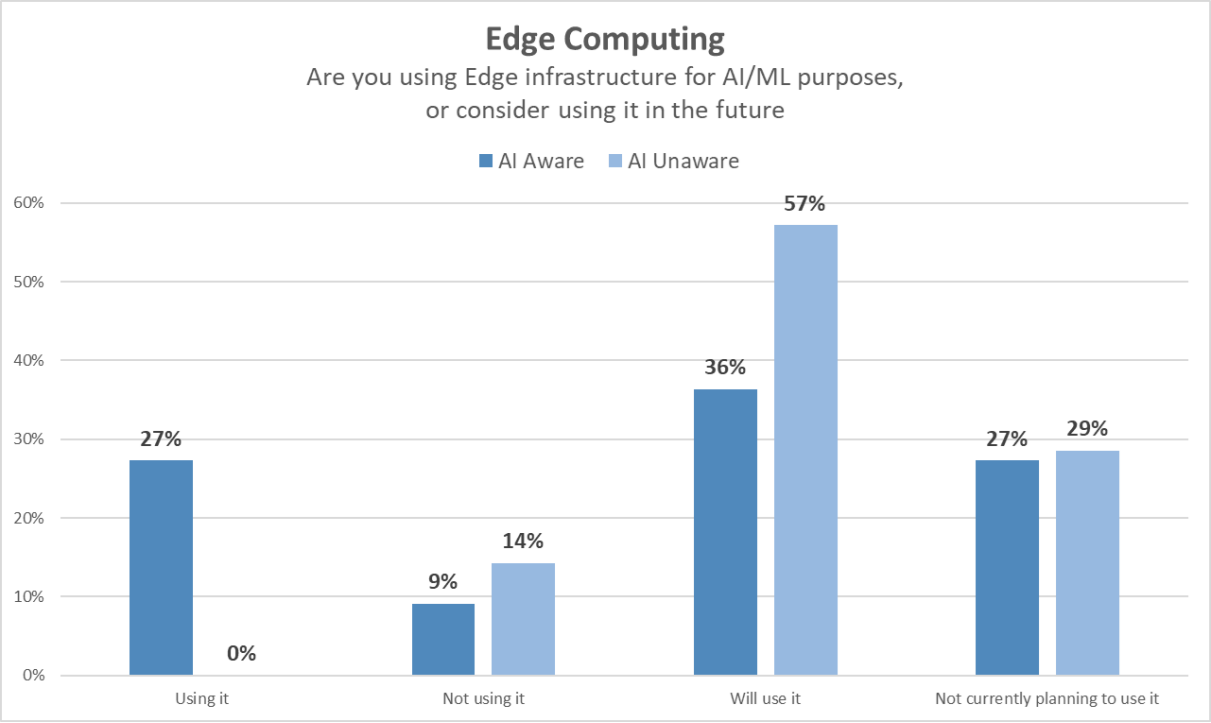
Surprisingly, AI unaware respondents report that they have data analyses that take months to complete.



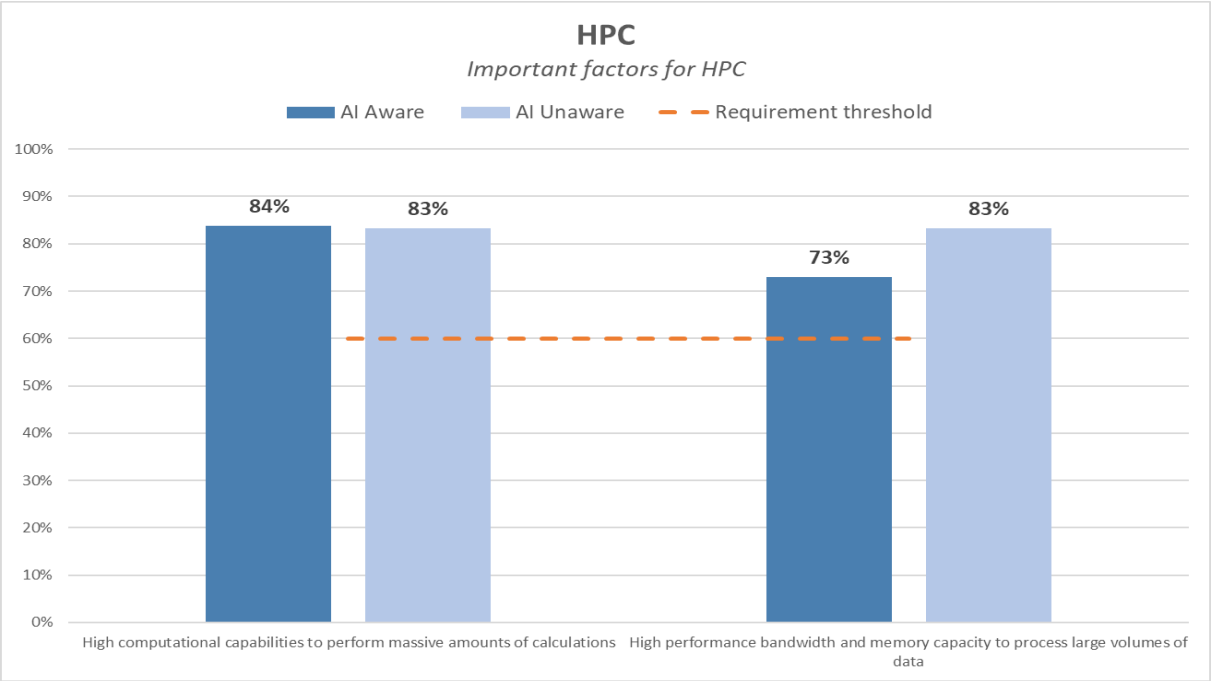
Again, we see that data analysis on data in the Petabyte range is rare.



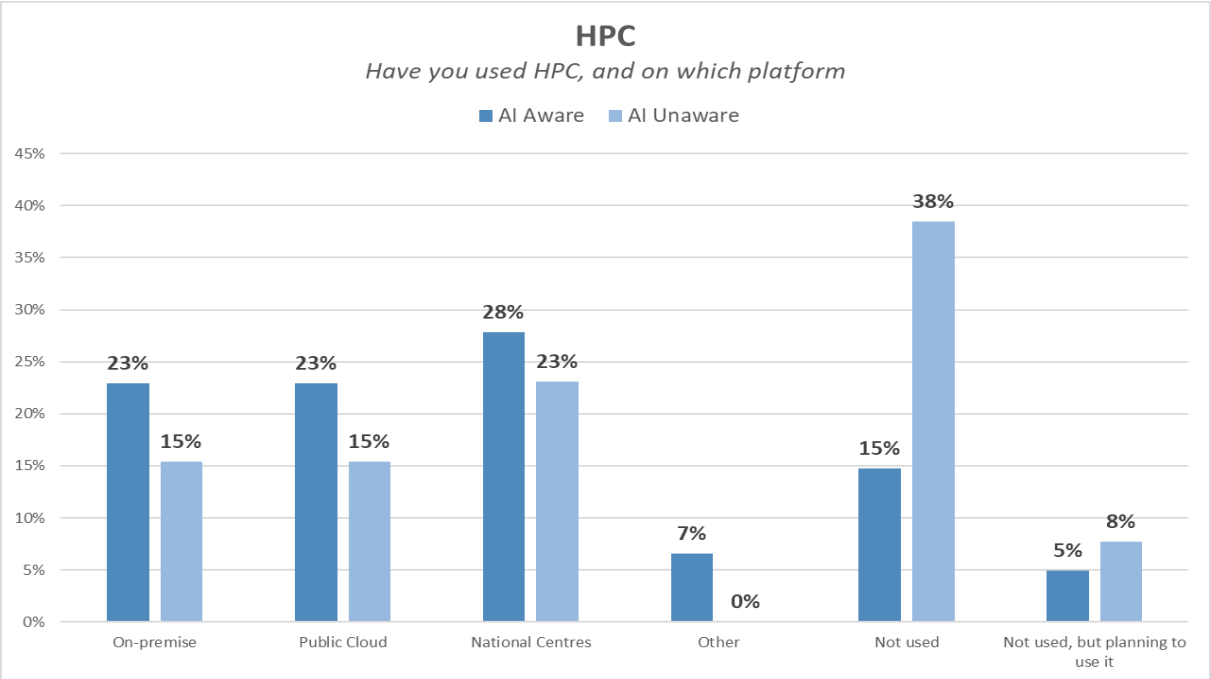
For DIHs, access to data from many sensors scores higher than for other types of respondents. However, apart from this distinction, the results align with the overall findings and confirm the significance of the security and privacy factor.



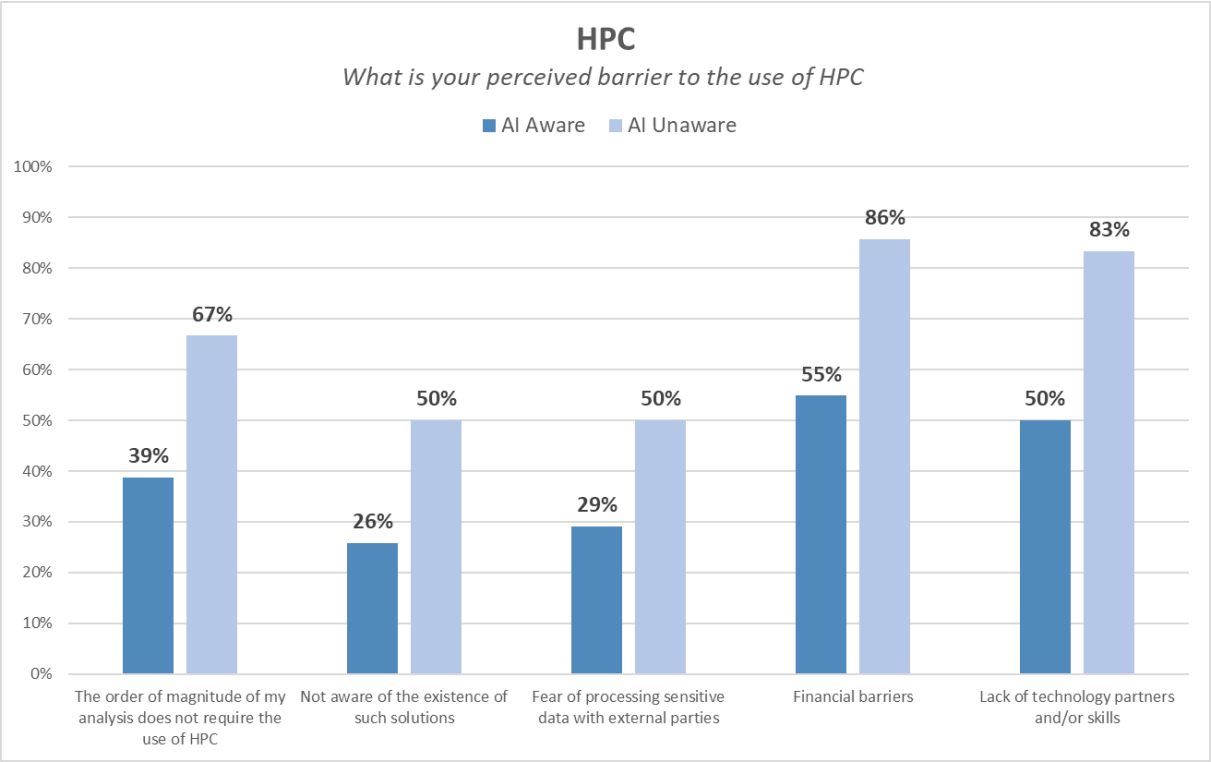
The interest from DIH respondents for Edge computing is a bit higher than for other respondents. 63% of AI aware respondents are either already using it or plan to use it. None of the AI unaware respondents are currently using it, but 57% plan to use it.



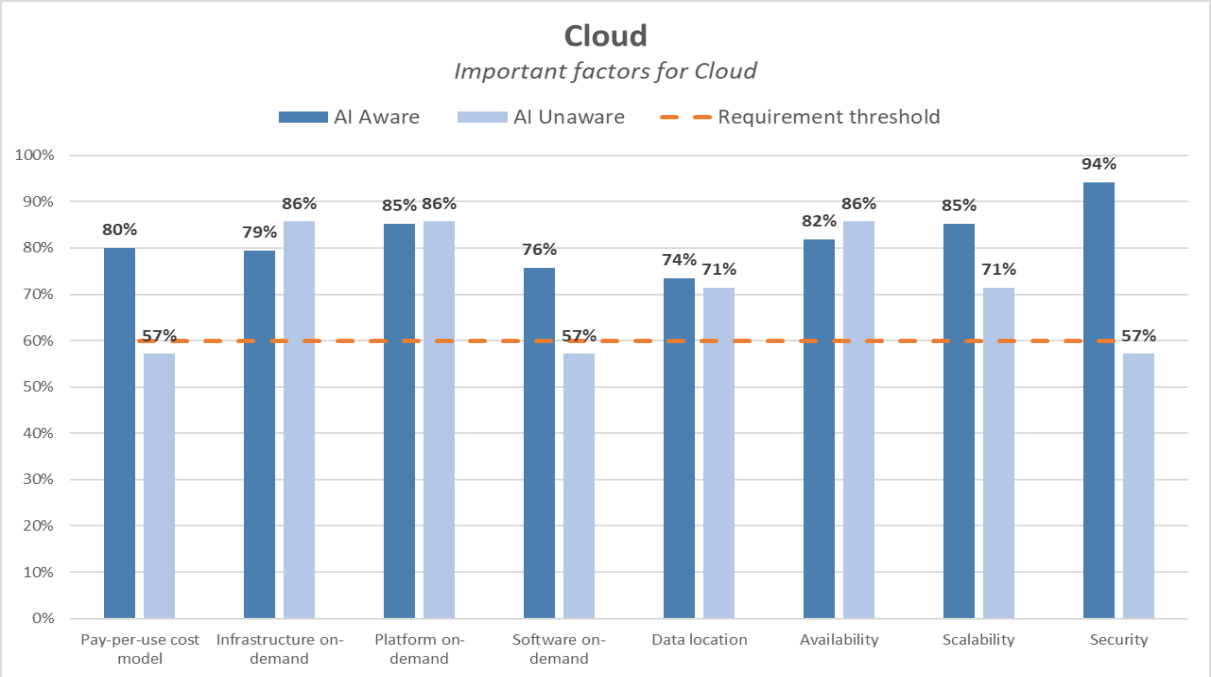
Similar results as for other types of respondents. However, in this case, also the AI unaware respondents recognize the importance of the identified factors.



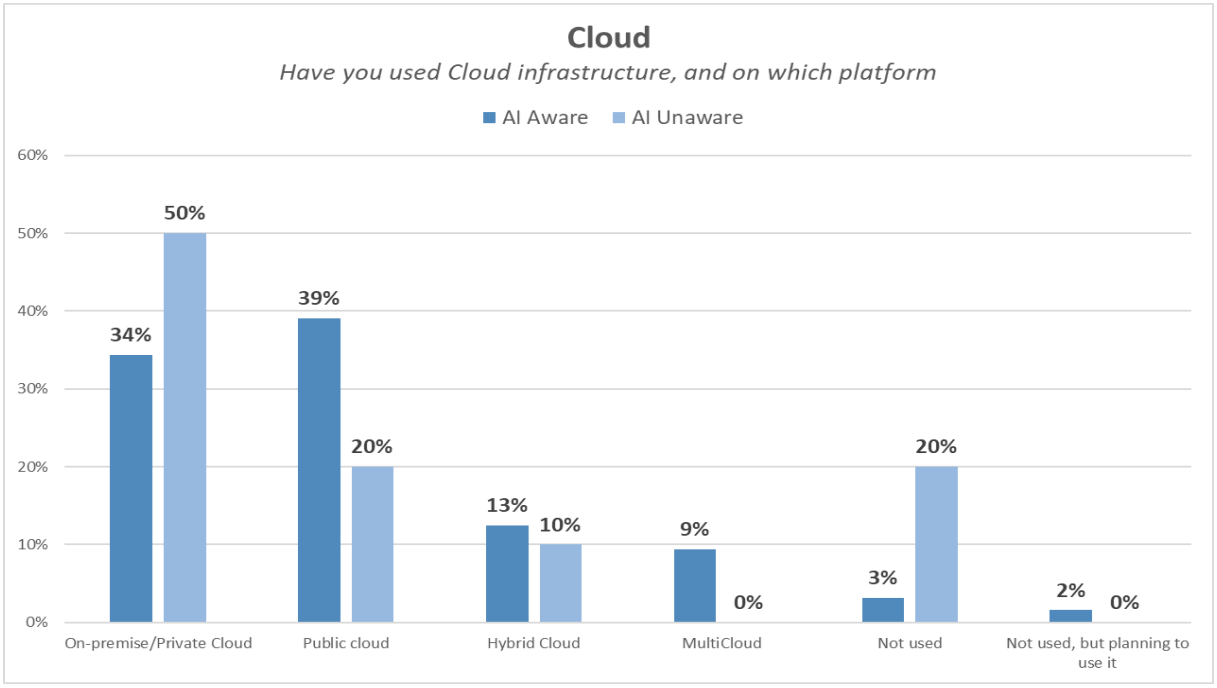
The usage of HPC for AI aware respondents seems to be almost shared equally between On-premise, Public Cloud and National Centers. Only a small portion of DIH respondents have never used HPC resources. In comparison, among AI unaware respondents, there is a slightly higher preference for national centers, and a considerable part has never used it. Additionally, only a few have plans to use it in the future.



Financial barriers and Lack of technology partners are again perceived to be the most important barriers for usage of HPC infrastructure.



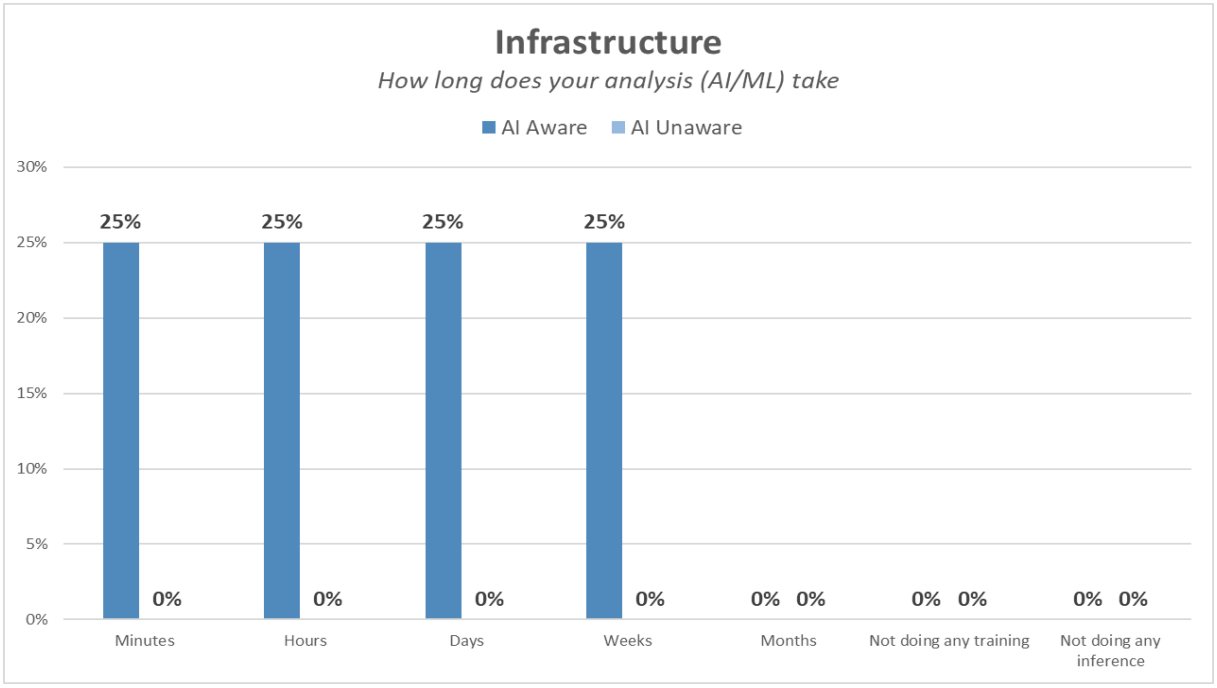
AI aware respondents from the DIH segment report that Security is the most important factor for cloud, but all the listed factors are perceived as important.

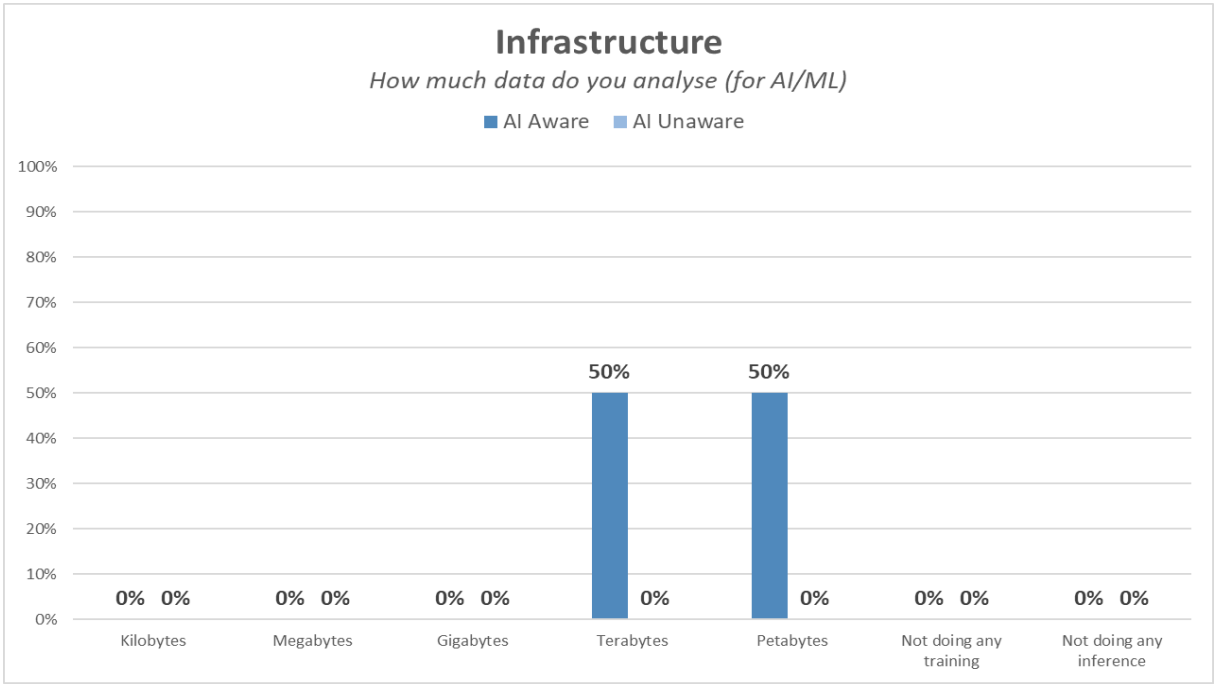


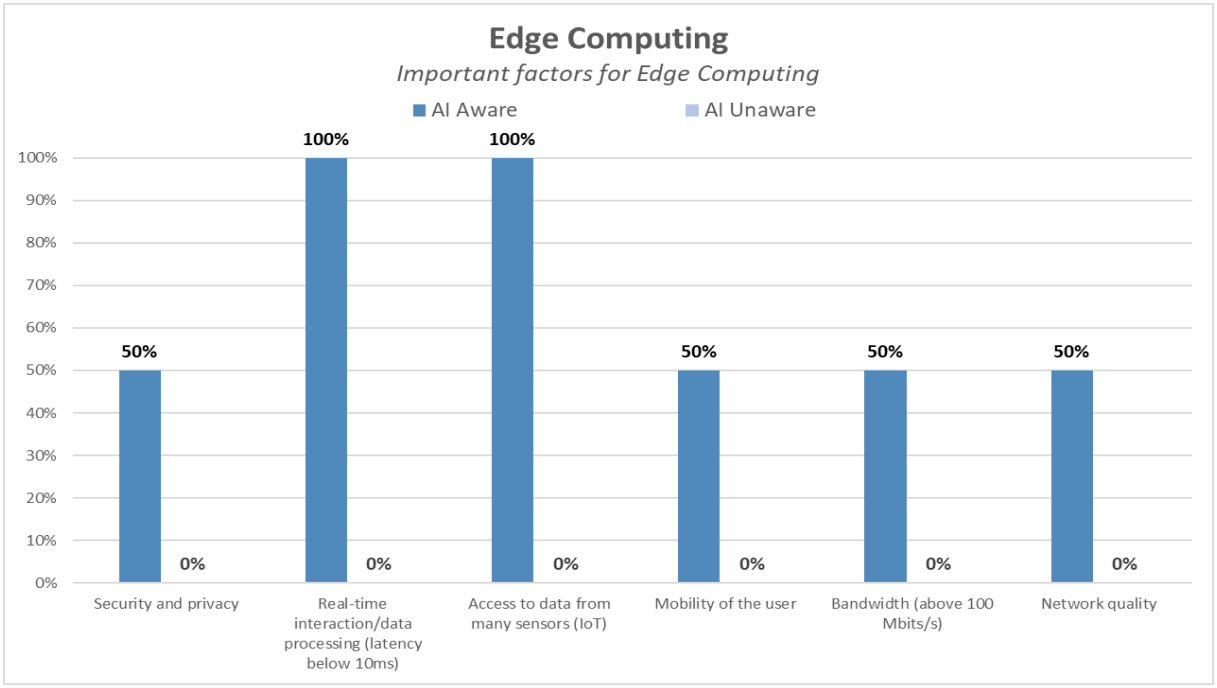
DIH and public bodies respondents both reports that On-premise/Private Cloud is the most frequently used Cloud infrastructure type.

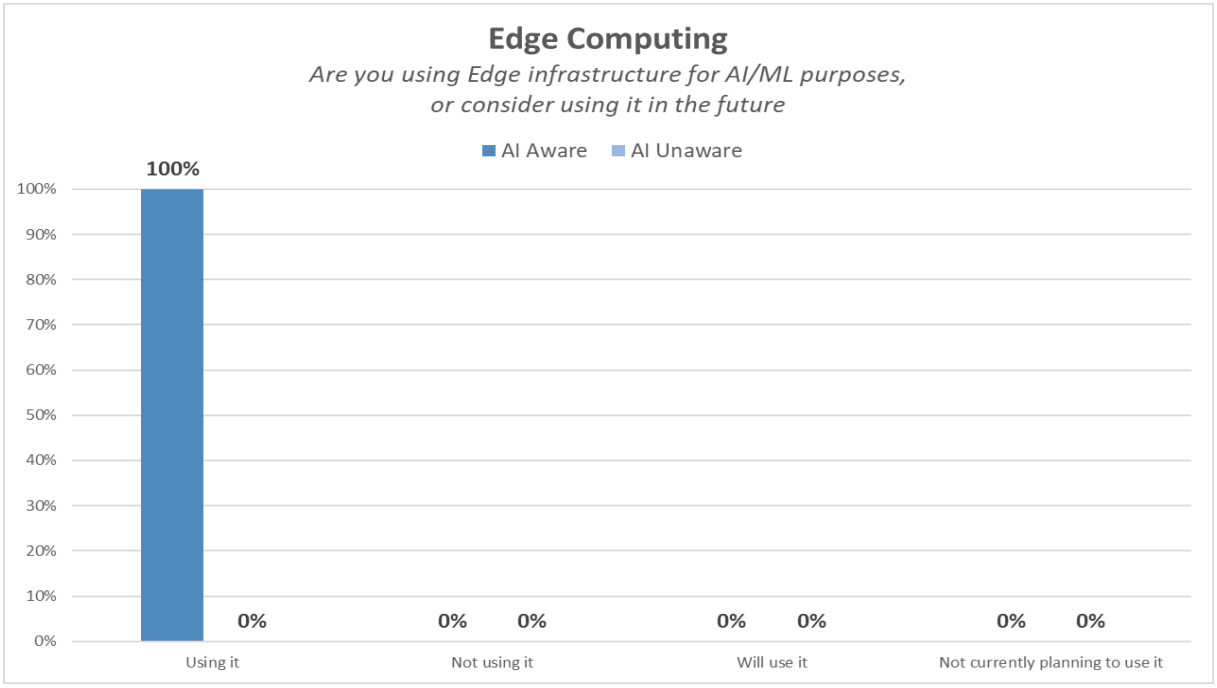
10.4.1.4 TEFs

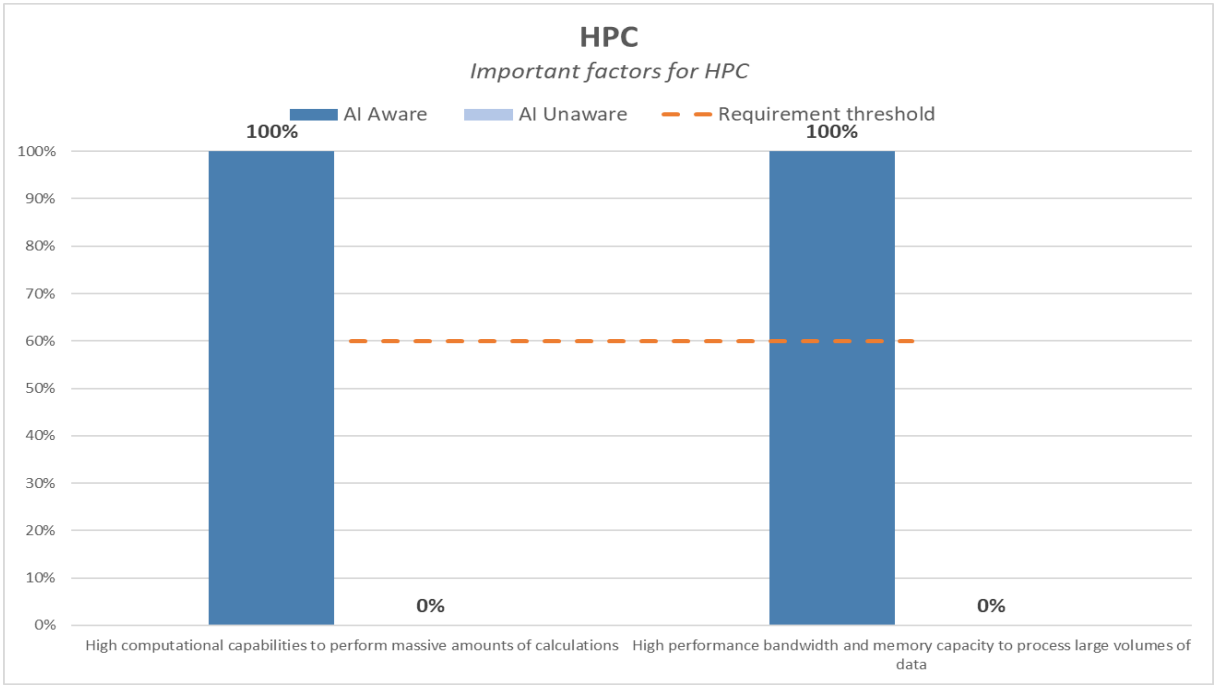
As a result of relatively few respondents from TEFs, some of the questions in the questionnaire received no answers. For the rest of the questions three or less valid responses were obtained. We have therefore not included any graphs for the questions with no answers, nor have we tried to describe notable observations with text under the remaining graphs since we do not consider the answers to be representative due to the low number of respondents.

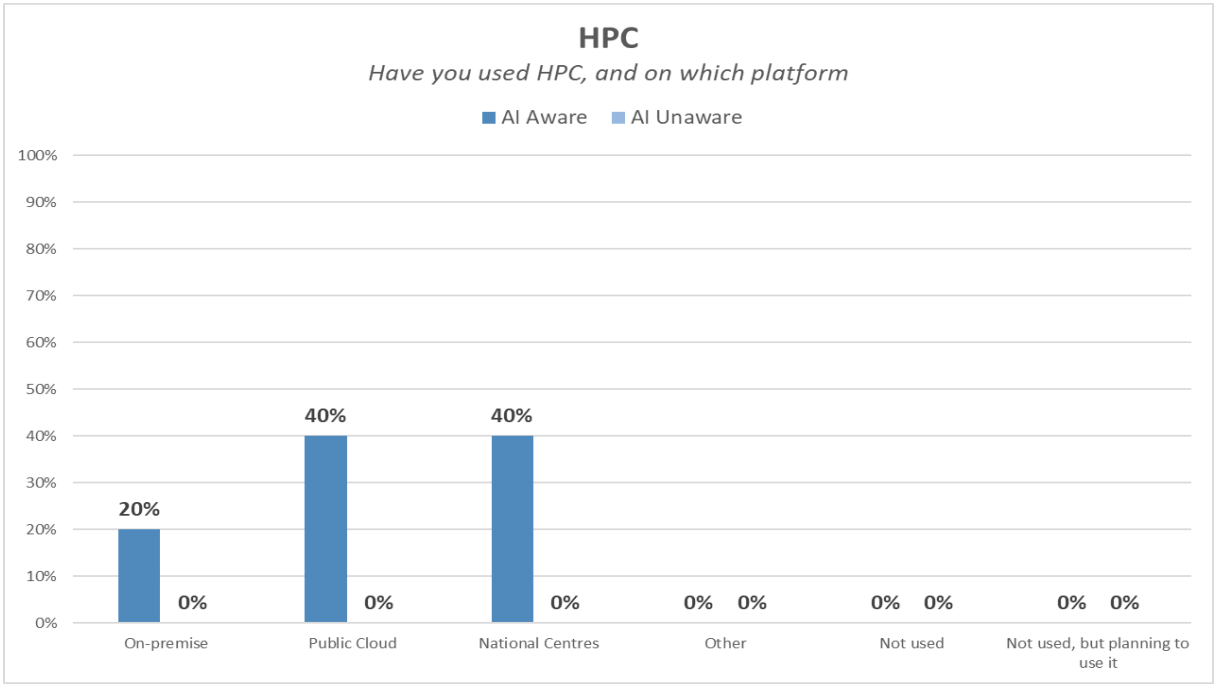


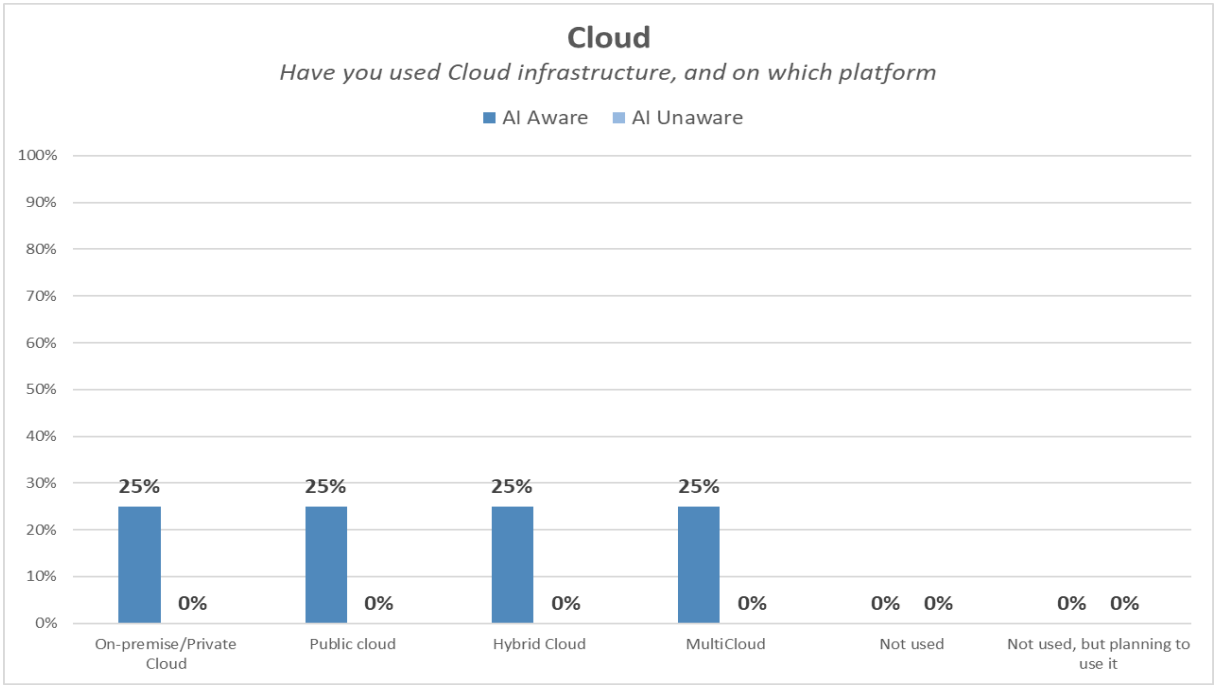

Infrastructure
How much data do you analyse (for AI/ML)
AI Aware
AI Unaware
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0% 0%
0% 0%
0% 0%
50%
0%
50%
0%
0% 0%
0% 0%
Kilobytes
Megabytes
Gigabytes
Terabytes
Petabytes
Not doing any training
Not doing any inference


Edge Computing
Important factors for Edge Computing
AI Aware
AI Unaware
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
50%
0%
100%
0%
100%
0%
50%
0%
50%
0%
50%
0%
Security and privacy
Real-time interaction/data processing (latency below 10ms)
Access to data from many sensors (IoT)
Mobility of the user
Bandwidth (above 100 Mbits/s)
Network quality


Edge Computing
Are you using Edge infrastructure for AI/ML purposes, or consider using it in the future
AI Aware
AI Unaware
100%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0%
0%
0%
0%
0%
0%
0%
Using it
Not using it
Will use it
Not currently planning to use it


HPC
Important factors for HPC
AI Aware
AI Unaware
Requirement threshold
100%
100%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0%
0%
High computational capabilities to perform massive amounts of calculations
High performance bandwidth and memory capacity to process large volumes of data





10.4.2 Overview of existing literature and AI assets

10.4.2.1 Review - European High-Performance Computing (EUROHPC)

Date of the review	23.03.2023
Name of the project or initiative / report reviewed	EuroHPC JU
Project Owner / Author	EuroHPC JU
Link to the project or any useful documents	https://eurohpc-ju.europa.eu/

Main functionalities delivered by the project / Main points covered in relation to Infrastructure

EuroHPC JU is a joint initiative between the European Union, European countries and private partners, with the mission of developing, deploying, extending, and maintaining an integrated world class supercomputing and data infrastructure in the Union. The JU's objectives were updated following the adoption of the new Council Regulation 2021/1173[10] in July 2021, including federating the hyper-connected supercomputing and data infrastructure, and reinforcing the market take-up of High-Performance Computing and Quantum Computing technologies both in the public and private sectors. “This infrastructure should provide access to the public sector users, users from industry, including small and medium-sized enterprises (SMEs), and users from academia” as stated in the Council Regulation 2018/1488[11] establishing the EuroHPC JU as a legal and funding entity.

- The JU's current access policy allows researchers from academia, research institutes, public authorities and industries established or located in an EU Member State, or a country associated with Horizon or Digital Europe Programme to apply and access EuroHPC supercomputers free of charge.
- The JU has already procured nine supercomputers. The first European exascale supercomputer Jupiter that will be installed in Julich, Germany. Three pre-exascale supercomputers: LUMI in Finland and LEONARDO in Italy that are operational and MareNostrum5 in Spain that is underway. Five petascale supercomputers: Vega in Slovenia, MeluXina in Luxembourg, Discoverer in Bulgaria and Karolina in the Czech Republic that are operational and Deucalion in Portugal that is underway.
- Currently three calls to access the EuroHPC supercomputers are open: the call for regular access, the call for extreme scale access and the call for benchmark and development access. The extreme scale access call is specifically distributing resources from the EuroHPC pre-exascale systems, while the regular access and the benchmark and development ones also include the petascale systems.
- The JU is planning to widen industrial access to its supercomputers through the launch of a call for expression of interest for the selection of a hosting entity to acquire and operate an industrial grade EuroHPC supercomputer by the end of 2023, that takes into account the specific needs of industrial users including confidentiality, security and specialized capacities for AI model.
- The EuroHPC JU funds research and innovation (R&I) activities including artificial intelligence and promoting innovation using HPC in SMEs. EuroCC is one of the JU's strategic initiatives to address the skills gap in the European HPC ecosystem, and it has built a European network of more than 30 national HPC competence centers across Europe. The EuroCC's competence centers act as hubs to promote and facilitate HPC and related technologies across academia, industry and public administration.
- The JU offers training activities, such as the EuroHPC academy and master in HPC, to facilitate the use of its supercomputers.

Review summary note

EuroHPC JU is the leading European initiative for HPC. Its infrastructure provides access to users from various sectors, including the public sector, academia and industry, including SMEs. The EuroHPC JU systems are already being utilized by over 20 SMEs, and over 50 SMEs are involved in several EuroHPC JU R&I projects or profited from these.
The initiative offers training activities that aim to fill the competency gap in using such infrastructure. It has the potential to promote innovation and expand the use of HPC in various sectors, including SMEs, allowing them to explore its benefits and potential. It has the capacity, among other things, to enable the training of large language models like the ones behind ChatGPT, which was previously unachievable or only available to large industries.

[10] https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32021R1173
[11] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.252.01.0001.01.ENG

10.4.2.2 Review - European Open Science Cloud (EOSC)

Date of the review	29.05.2023
Name of the project or initiative / report reviewed	EOSC
Project Owner / Author	EOSC
Link to the project or any useful documents	https://www.eosc.eu/ https://eosc-portal.eu/
Main functionalities delivered by the project / Main points covered in relation to SMEs	
In 2015, the European Commission (EC) proposed the creation of a European Open Science Cloud (EOSC) to enable the development and uptake of Open Science in Europe. The aims are to federate existing and emerging research data infrastructures with the objective of offering a virtual research environment in Europe and create a Web of FAIR Data and Related Services for Science, ensuring that research data is interoperable and machine-actionable according to the FAIR guiding principles[12]. By enabling the integration of linked datasets, EOSC empowers researchers to discover, utilize, and combine data, paving the way for the development of innovative artificial intelligence (AI) tools and fostering new research approaches and discoveries. Overall progress is steered by a new EOSC tripartite governance[13] involving the EU represented by the European Commission, the participating countries represented in the EOSC Steering Board[14] and the research community represented by the EOSC Association[15]. EOSC is expected to progressively expand its user base as explained in its Strategic and Innovation Agenda[16]. As part of this staged development approach, EOSC aims to extend the EOSC knowledge ecosystem beyond the core research community and engage diverse groups belonging to the broader public and private sector. The involvement of industry in EOSC, and the interaction between research and industry is supported by the use of the data and services registered in the Marketplace component of the EOSC platform (accessed via the EOSC Portal[17]). Here industries can offer value-added services using research data of commercial relevance but may also consume scientific output. As a service provider/developer, the private and public sector can find in EOSC a commercialization channel to promote their services via the EOSC Catalogue and Marketplace. Moreover, as consumers, they can find a mechanism to access publicly funded open access/FAIR datasets, a range of services that can help them exploit open access/FAIR datasets, and a means of interacting with the groups producing the datasets and services. EOSC also supports the collaboration among institutions and the private sector through the EOSC Digital Innovation Hub[18] (DIH), a mechanism working at European level, for private companies to collaborate with public sector institutions in order to access technical services, research data and human capital. The EOSC platform architecture has four main parts: EOSC Exchange includes services and data sources onboarded to EOSC by research infrastructures, clusters and projects, serving the needs of one or more research communities as well as the general public and private sector; EOSC Core contains enabling services required to operate the EOSC and the coordination functions; EOSC Interoperability Framework identifies standards and guidelines that each service can and should comply with, to increase the ability of users to connect services into more powerful and useful combinations; EOSC Support activities complement the other services and include services such as training and the Digital Innovation Hub.	
Review summary note	

[12] https://www.go-fair.org/fair-principles/
[13] https://eosc.eu/tripartite-collaboration
[14] https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3756
[15] https://www.eosc.eu/eosc-association
[16] European Commission, Directorate-General for Research and Innovation, Strategic Research and Innovation Agenda (SRIA) of the European Open Science Cloud (EOSC) –, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/935288
[17] https://eosc-portal.eu/
[18] https://eosc-dih.eu/

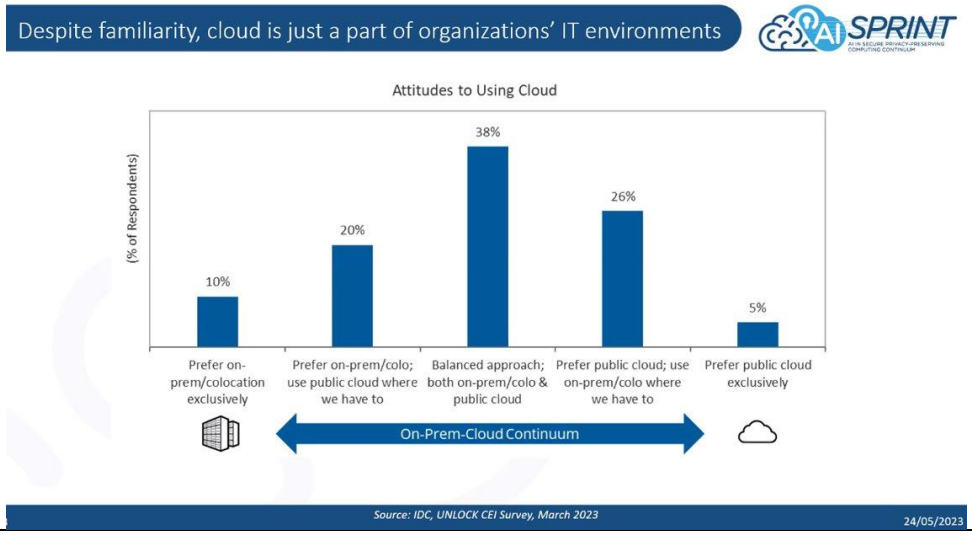
Participating in EOSC offers a dual benefit: it serves as a platform to promote and commercialize services while providing access to a wide range of resources, mainly data and data sources. Currently, the EOSC marketplace hosts 413 services, including 5 specifically related to artificial intelligence, such as the DEEP training facility, which offers tools for building and training Machine Learning and Deep Learning models. Out of these services, 72 are also dedicated to businesses, like the EGI compute cloud, which provides a hybrid cloud solution with numerous providers distributed across Europe. Ongoing projects are continuously enhancing EOSC, like AI4EOSC that plans to improve the services offered by the DEEP training facility.

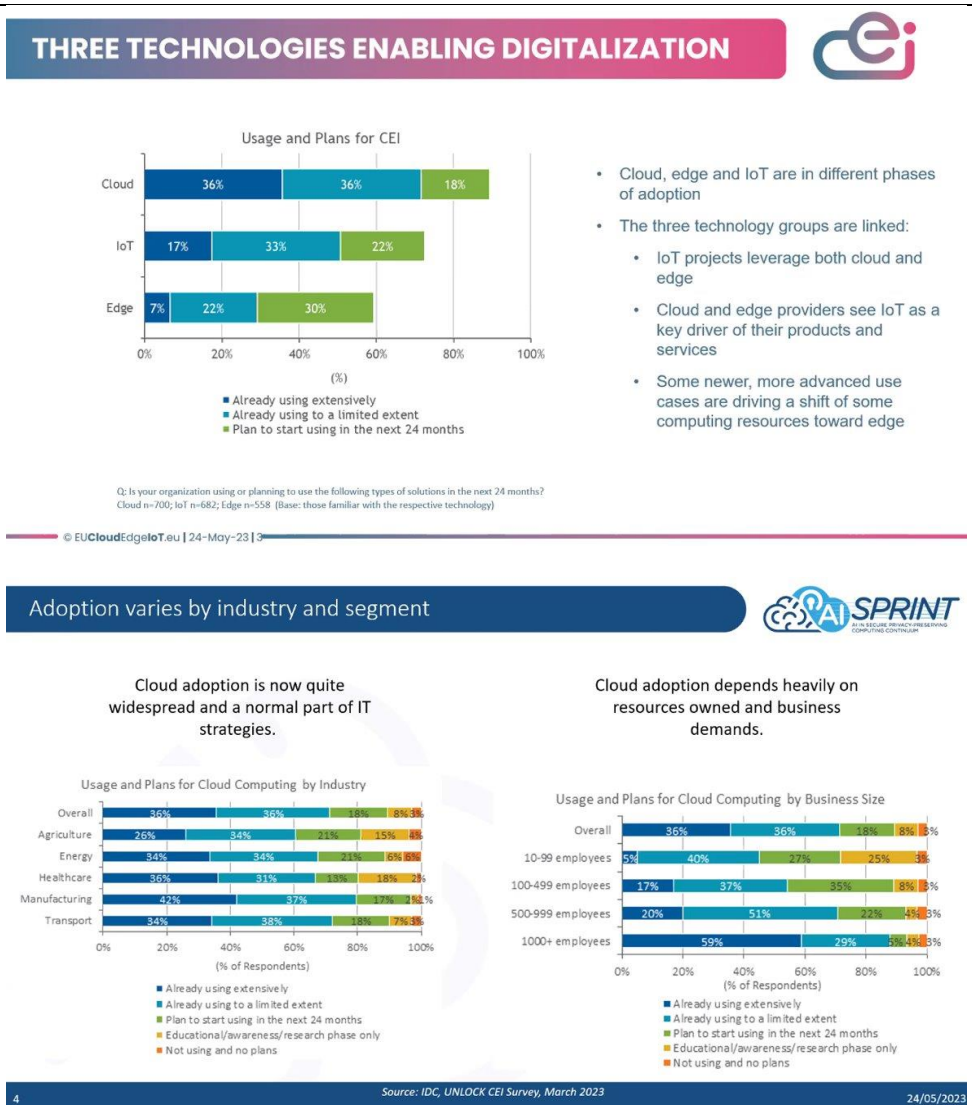
10.4.2.3 Review - European Cloud, Edge & IoT Continuum (EUCloudEdgeIoT)

Date of the review	30.06.2023
Name of the project or initiative / report reviewed	Building the European Cloud, Edge & IoT Continuum for business and research
Project Owner / Author	EUCloudEdgeIoT.eu EUCloudEdgeIoT.eu has received funding from the EU's Horizon Europe research and innovation programme under CL4-2021_DATA-01-01-Coordination and Support of CloudEdge-IoT domain (CSA), Grant agreement ID 101070571 (UNLOCK-CEI) and 101070030 (Open Continuum). The Consortium includes Atos, BluSpecs, COMMpla, Eclipse Foundation, EGI foundation, IDC, Inside Industry Association, Martel Innovate, Trialog, Trust-IT Services, VDI/VDE-IT.
Link to the project or any useful documents	https://eucloudedgeiot.eu/: https://eucloudedgeiot.eu/wp-content/uploads/2022/12/Joint-Press-Release-with-multipliers-_December-2022-1.pdf https://eucloudedgeiot.eu/resources/
Main functionalities delivered by the project / Main points covered in relation to Infrastructure	
The EUCloudEdgeIoT.eu initiative aims to realize a pathway for the understanding and development of the Cloud, Edge and IoT (CEI) Continuum by promoting cooperation between a wide range of research projects, developers and suppliers, business users and potential adopters of this new technological paradigm. The European Cloud, Edge & IoT Continuum is supported by the effort of two Coordination and Support Actions (CSAs), namely Open Continuum and UNLOCK-CEI, which will cooperate focusing respectively on the supply and demand sides of the CEI Continuum. These will also benefit from the synergies and legacy of other existing EU projects in the domains of Cloud, Edge, IoT, AI, and connectivity.	
Review summary note	
This is an interesting initiative for several reasons. The UNLOCK-CEI deliverables D1.1 and D1.2 on the Cloud-Edge-IoT Demand Landscape leverage IDC research on the CEI market and other major sources. The primary data collection (UNLOCK-CEI Survey) includes a sample of 700 businesses (from the Manufacturing Energy and utilities, Healthcare, Transportation and Agriculture sectors) and addresses the following topics: • Awareness of CEI technologies • Adoption and deployment of CEI • Maturity of CEI projects	

- Benefits of CEI projects
- Challenges inhibiting deployment of CEI projects
- Preferences for cloud, edge or traditional IT infrastructure
- Data sovereignty
- Preferences when selecting CEI technology providers.

The documents have a direct relevance to Pre-PAI and our analysis of possible future infrastructure offers by the AIoD platform. The questions asked in the underlying surveys complement the questions asked in the Pre-PAI WP2 survey.
In D1.1 (submitted 30/11/2022) findings on challenges that impact adoption rates are presented (on page 7): “Some of the key challenges slowing cloud migrations include security concerns about turning over sensitive applications and data to a third party for management; concerns about lock-in to a specific cloud provider; a shortage of skills needed for utilizing cloud systems; and challenges integrating with existing systems. Among the challenges slowing down the adoption of edge technologies are a lack of qualified workforce and skills; lack of funding; difficulties adapting current systems to edge solutions; and a lack of adequate supporting infrastructure. The biggest challenges slowing down IoT deployments were reported in IDC surveys to be costs, security and complexity. Industry is making great progress in addressing these challenges, but the fragmentation of customer needs across so many different use cases makes this process a gradual one”.
The next version of the demand report (to be submitted in May 2023) under D1.2 will include the results of a custom survey, conducted in March 2023, to tackle the CEI market dimensions indicated in the previous paragraphs (page 7): “The survey will involve a representative sample of European business users, with 700 interviews, in five selected verticals of manufacturing, energy, mobility, healthcare and agriculture. Moreover, the next deliverable (D1.2) will include the results of deep dive interviews with industrial stakeholders in terms of emerging business opportunities driven by the paradigm shift towards CEI”.
Results from this survey were presented in the May 24, 2023 AI-Sprint webinar Computing Continuum and the role of AI as a complementary technology: European market forecast and insights and have been included in the analysis for synthesizing requirements (chapter 8.3). Some examples are found in the below slides.





10.4.2.4 Review - StarlingX

Date of the review	10.05.2023
Name of the project or initiative / report reviewed	STARLINGX
Project Owner / Author	OpenInfra Foundation (https://openinfra.dev)
Link to the project or any useful documents	https://www.starlingx.io
Main functionalities delivered by the project / Main points covered in relation to Infrastructure	
StarlingX goal is to empower organizations to deploy and manage high-performance, distributed (edge) cloud infrastructure at scale	
Review summary note	
The computing continuum is evolving, and Edge infrastructure is at an increasing rate becoming available. As with Cloud infrastructure it is possible to create the availability of IaaS, PaaS, SaaS to	

third parties in many ways using a plethora of open source and/or proprietary tech stack elements. The hyperscalers (e.g., Google, AWS, Microsoft) are increasingly building their offerings on proprietary technology even at chipset levels. Other public cloud providers are looking more and more to the open-source community for bits and pieces to build their public cloud offering from. Vendors wanting to provide Edge infrastructure to their customers can partner with one of the hyperscalers or build their offering based on open-source components. StarlingX is one of several open-source projects providing open-source components for Edge Cloud infrastructure. The main features of StarlingX are:

- Low latency Linux host OS
- Components from other open-source projects (IPMI/Redfish, TPM, Apache, Horizon, CEPH, Keystone, ETCD, Docker, Calico, PostgreSQL)
- A management layer including host management, fault management, software management configuration management and service management.
- Kubernetes, Docker Registry, FluxCD, Helm
- On top of all the above StarlingX provides centralized infrastructure orchestration for the resulting distributed Edge Cloud.

The distributed Kubernetes clusters (served to customers) can host any cloud-native workloads including OpenStack/KVM (In order to also provide VM Workloads).

10.4.2.5 Review - AI for Next Generation Computing: Emerging Trends and Future Directions

Date of the review	20.04.2023
Name of the project or initiative / report reviewed	AI for Next Generation Computing: Emerging Trends and Future Directions
Project Owner / Author	Sukhpal Singh Gill, Minxian Xu, Carlo Ottaviani, Panos Patros, Rami Bahsoon, Arash Shaghaghi, Muhammed Golec, Vlado Stankovski, Huaming Wu, Ajith Abraham, Manmeet Singh, Harshit Mehta, Soumya K. Ghosh, Thar Baker, Ajith Kumar Parlikad, Hanan Lutfiyya, Salil S. Kanhere, Rizos Sakellariou, Schahram Dustdar, Omer Rana, Ivona Brandic and Steve Uhlig
Link to the project or any useful documents	2022 Elsevier IoT Journal
Main functionalities delivered by the project / Main points covered in relation to Infrastructure	
• Large scale computing power and external data sources are needed for many AI/ML/DL techniques • Innovative research on Explainable AI (XAI) might pave the way for more widespread use of AI in modern computer systems • Distributed computing has evolved from content delivery networks to become a generally accepted and commonly used edge computing paradigm that brings processing and data storage closer to the end user's location. Edge data centers may be of vital importance to handle the increase in data volumes. • Customers are more concerned about their privacy and want to know how and where their data is acquired and maintained. Edge data centers under national jurisdiction may help mitigate concerns. • Edge computing is a major enabler for AI, giving high-quality performance at a low cost • AI/ML is an important enabler for automating deployment and maintenance of the highly sophisticated and complex future compute-continuum (cloud, fog, edge, serverless, quantum computing and networks interconnecting them). AI/ML based systems for automation will be highly cost-effective.	

Review summary note Edge infrastructure may in the future be a large pool of resources that could be utilized by an AI-on-Demand platform. To facilitate for usage, the available Edge infrastructure and other available resources (e.g., datasets stored and available at the Edge, software, services, etc.) need to be discoverable and described (i.e., existence of meta data describing the resources available in detail). In addition, mechanisms (APIs) to invoke the available resources must be well defined and available including proper authentication, authorization mechanisms, etc.

10.4.2.6 Review - A roadmap on learning and reasoning for distributed computing continuum ecosystems

Date of the review	10.05.2023
Name of the project or initiative / report reviewed	A roadmap on learning and reasoning for distributed computing continuum ecosystems
Project Owner / Author	Andrea Morichetta, Victor Casamayor Pujol, Schahram Dustdar
Link to the project or any useful documents	2021 IEEE International Conference on Edge Computing
Main functionalities delivered by the project / Main points covered in relation to Infrastructure	
• As we envision increasingly complex applications, deriving features only from a specific computing layer is insufficient, demanding enlarging the perspective on all the computing tiers, such as IoT, Fog, Edge, Cloud • HPC, Cloud, Edge and Fog should be viewed as a continuum and need to be managed as such. In principle they all provide the same type of low-level services (i.e., access to compute, storage and networks) but vary when it comes to higher level service types (i.e., scalability, elasticity, etc.). Nevertheless, management of this continuum needs to be distributed in nature across the continuum. • Their hypothesis is that using rule-based local management solutions is insufficient and that generative models for interoception, proprioception and exteroception developed using causal inference, deep learning and semantic communication AI/ML techniques can be effective tools in order to perform computing continuum management (CCM). They use knowledge from the field of neuroscience to explain how this management can resemble how humans manage complex environments. • The goal is self-organizing management systems that are capable of handling the constantly changing environment that constitutes the continuum.	
Review summary note	
Different types of infrastructures will continue to exist, but we need to explore how to manage and run services on such infrastructure in a coherent fashion.	

10.4.2.7 Review - Towards containerized, reuse-oriented AI deployment platforms for cognitive IoT applications

Date of the review	11.05.2023
Name of the project or initiative / report reviewed	Towards containerized, reuse-oriented AI deployment platforms for cognitive IoT applications
Project Owner / Author	Tiago Veiga, Hafiz Areeb Asad, Frank Alexander Kraemer, Kerstin Bach

Link to the project or any useful documents	https://www.sciencedirect.com/science/article/pii/S0167739X22004320
Main functionalities delivered by the project / Main points covered in relation to Infrastructure	
Highlights • Exploration of requirements for containerized AI platforms to serve IoT. • Case study with person counting optimized by visual attention maps. • Blueprint for a cognitive IoT architecture that optimizes system resources. • A gap analysis suggests future developments for AI deployment platforms.	

Table 1. Overview of the requirements for a cognitive version of the AI platform, together with design alternatives (if available) and design choices.

Requirements	Design alternatives	Design choices	Sect.
R1: Container Instance Management We need to manage multiple instances of a component, for instance to offer one manager component instance per device.	**A1.1:** One container instance per device **A1.2:** A single container for all device instances **A1.3:** A clustered solution.	We selected A1.1 as workaround, since A1.2 and A1.3 are not supported. For future versions of the platform, A1.3 would offer the best solution for developers.	8.1
R2: Closer Integration with Devices External devices should be represented in the graphical editor.	**A2.1:** Contain device nodes in the visual editor. **A2.2:** Add generic interfaces for incoming data from devices.	We selected A2.2 as workaround with a special component as interface to the devices.	8.2
R3: Explicit and Expressive Triggers We need to define triggers explicitly.	–	As a workaround, we implemented triggers as part of the manually written logic, not visible in the graphical editor.	8.3
R4: Reuse Below the Top-Level Reuse of containers also at the sub-level, not only top-level.	–	As a workaround, we placed the container for image detection at the top level, and routed communication from the device managers to it, instead of including it inside the device manager.	8.4
R5: Architecture Templates It should be possible to reuse also templates of architectures.	–	As workaround, we constructed our model from scratch, without reusing any template.	8.5

Review summary note

The paper “Towards containerized, reuse-oriented AI deployment platforms for cognitive IoT applications” by our colleagues at NTNU (Tiago Veiga, Kerstin Bach, et al) has been partly funded by AI4EU. The paper performs a gap analysis between the requirements of cognitive IoT

applications on the one side and the current functionalities of AI deployment platforms on the other side, see in particular Table 1 (snapshot above) which provides an overview of the requirements identified based on their selected use case (person counting in a skiing area through camera sensors) and the potential design alternatives.

10.5 Generative AI

10.5.1 Introduction and context

Following the European Commission's review on 31/03, two new open-format questionnaires have been created for SMEs and large industries, as well as for public bodies, integrating questions on Generative AI.

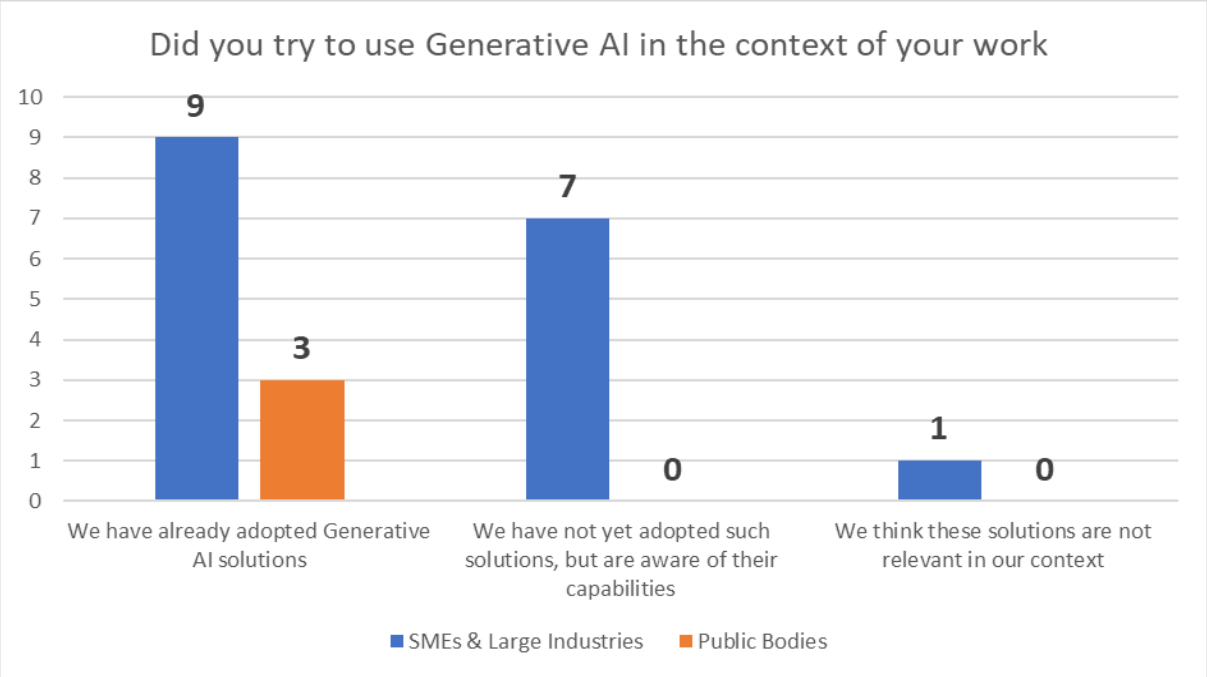
A set of questions on Generative AI (see chapter 10.5) has also been added to these questionnaires, in response to the expectations expressed by the European Commission during the review.

10.5.2 Results

We received 17 complete responses from the SMEs & large Industries open format questionnaire and 2 complete responses from the public bodies open format questionnaires.

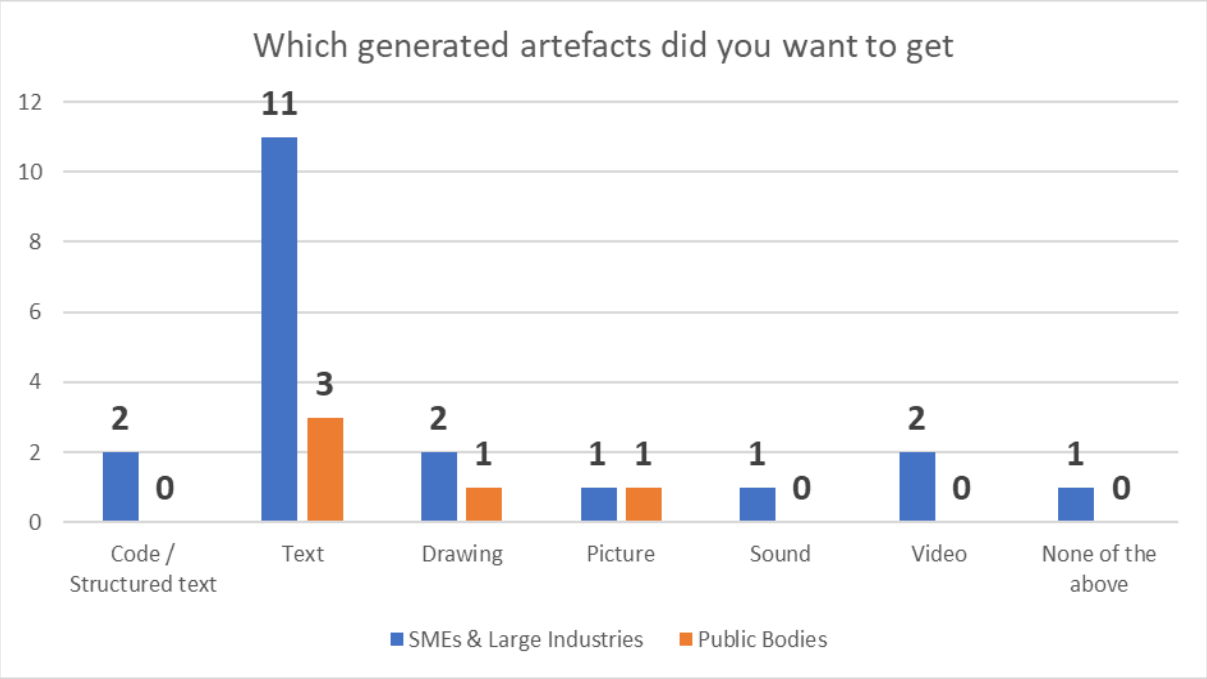
The low number of responses to this set of questions on Generative AI is explained by the fact that these questions were only included in the new open format questionnaires that were distributed following the intermediate EC review at the end of March and therefore benefited from a shorter exposure period than the existing questionnaires.

The results of which are shown in the graphs below.



Regarding the use of Generative AI solutions in **companies**, 9 out of 17 respondents indicated that they have adopted such solutions, demonstrating a considerable interest and utilization of this technology. Additionally, 7 respondents mentioned that they are aware of the capabilities of Generative AI solutions, despite not having adopted them yet. This suggests a growing awareness and recognition of the potential benefits offered by Generative AI. However, it is worth noting that one respondent expressed that Generative AI solutions are not relevant in their specific context, indicating that there may be certain industries or use cases where these solutions may not be applicable or deemed necessary. Overall, this analysis highlights a positive trend in the adoption and awareness of Generative AI solutions among the surveyed respondents, with the majority either adopting or having knowledge about these advanced AI technologies.

All the **public bodies** that answered the survey have already used Generative AI in the context of their work.

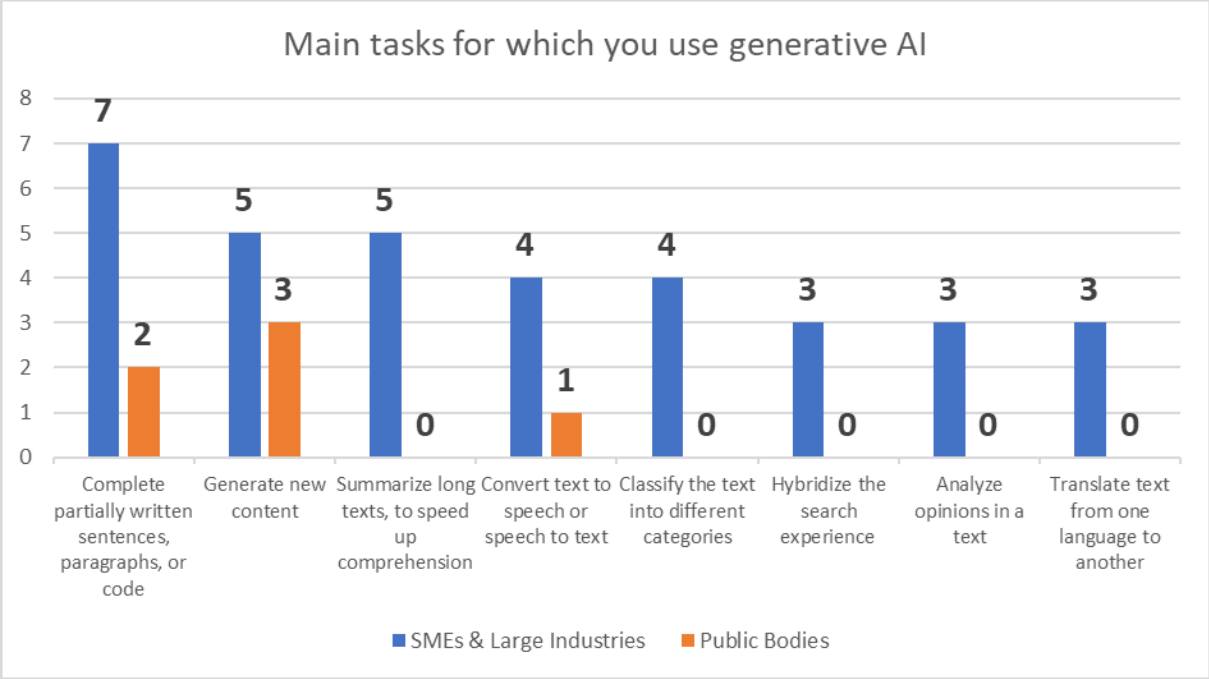


Companies have diverse preferences for the types of generated artifacts they desire from Generative AI solutions. Among the respondents, 2 companies expressed interest in obtaining code or structured text outputs from these solutions. This indicates a specific need for AI-generated programming code or structured text that can potentially assist in automating certain tasks or enhancing software development processes.

The majority of companies, with 11 respondents, expressed their desire to obtain text outputs from Generative AI solutions. This suggests a broad interest in AI-generated textual content, which could be used for various applications such as content generation, natural language processing, or automated writing.

Additionally, there were 2 companies each that expressed interest in obtaining drawings, videos, and sounds from Generative AI solutions, highlighting the potential for these solutions to assist in creative domains such as art, media production, and audio synthesis. One company mentioned an interest in receiving pictures as generated artifacts. One company indicated that they did not have a preference for any of the mentioned artifacts, suggesting a unique requirement or use case where Generative AI solutions may not be applicable.

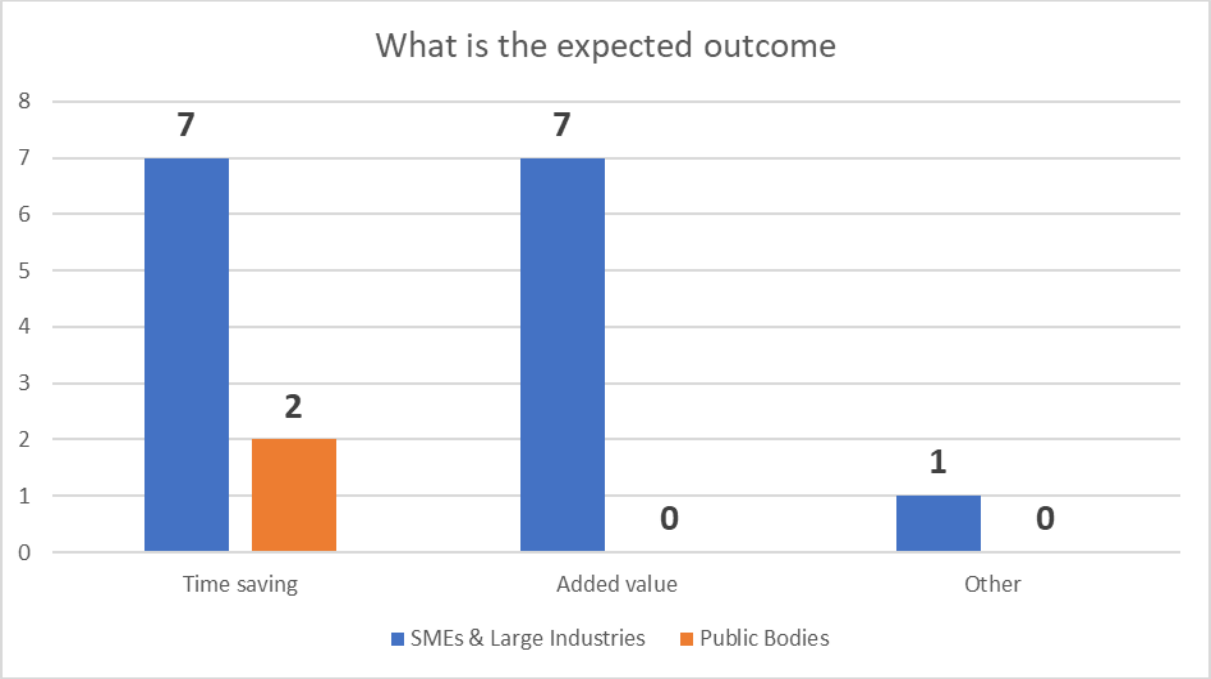
Public bodies that have used Generative AI in the context of their work expressed their interest in text, drawing and picture artifacts.



The surveyed **companies employ Generative AI for a range of tasks**. The most common application identified by 7 companies is the use of Generative AI to complete partially written sentences or code, indicating the potential for AI assistance in enhancing productivity and automating certain tasks.

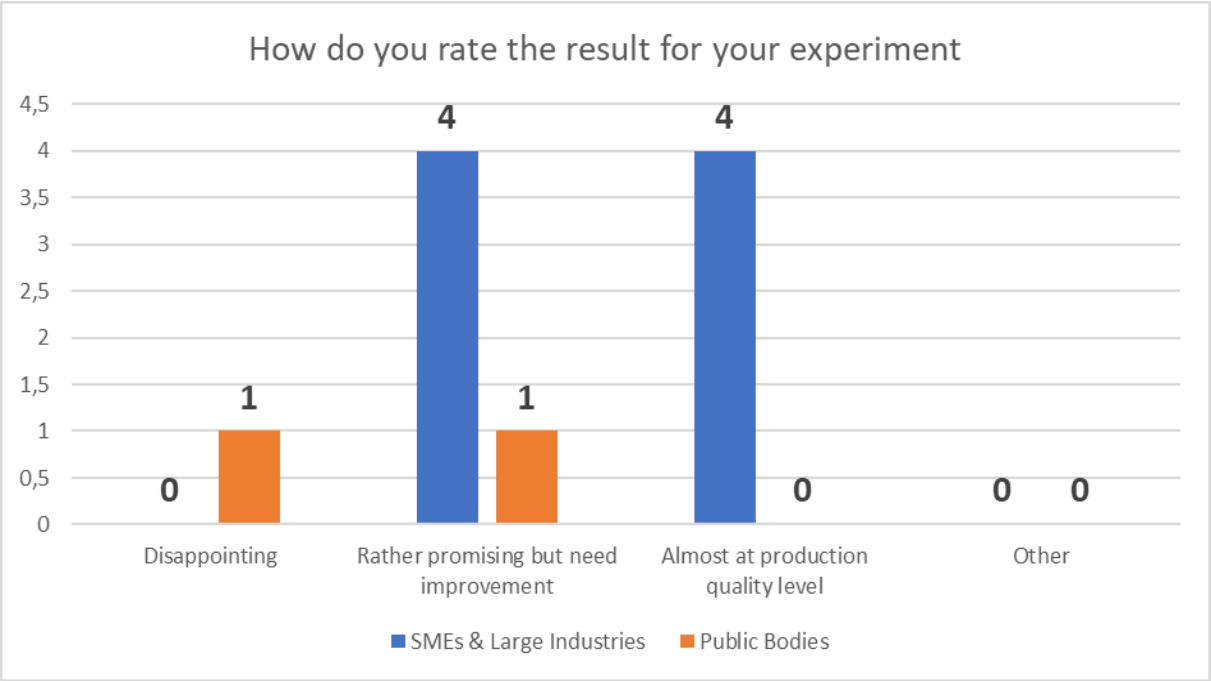
Additionally, 5 companies reported using Generative AI to generate new content, highlighting its usefulness in content creation and creative domains. Another frequent application mentioned by 5 companies is using Generative AI to summarize long texts, showcasing its ability to extract key information and provide concise summaries. Furthermore, the survey respondents identified several other applications for Generative AI, including converting text to speech, categorizing text into different categories, hybridizing search experiences, analyzing opinions in text, and translating text. These responses highlight the versatility and potential benefits of Generative AI across various domains and tasks, ranging from productivity enhancement to content creation and text analysis.

Generative AI was used by **public bodies** for the following tasks: 1. Summarize long texts to speed up comprehension; 2. Complete partially written sentences, paragraphs or code; 3. Convert text to speech or speech to text.



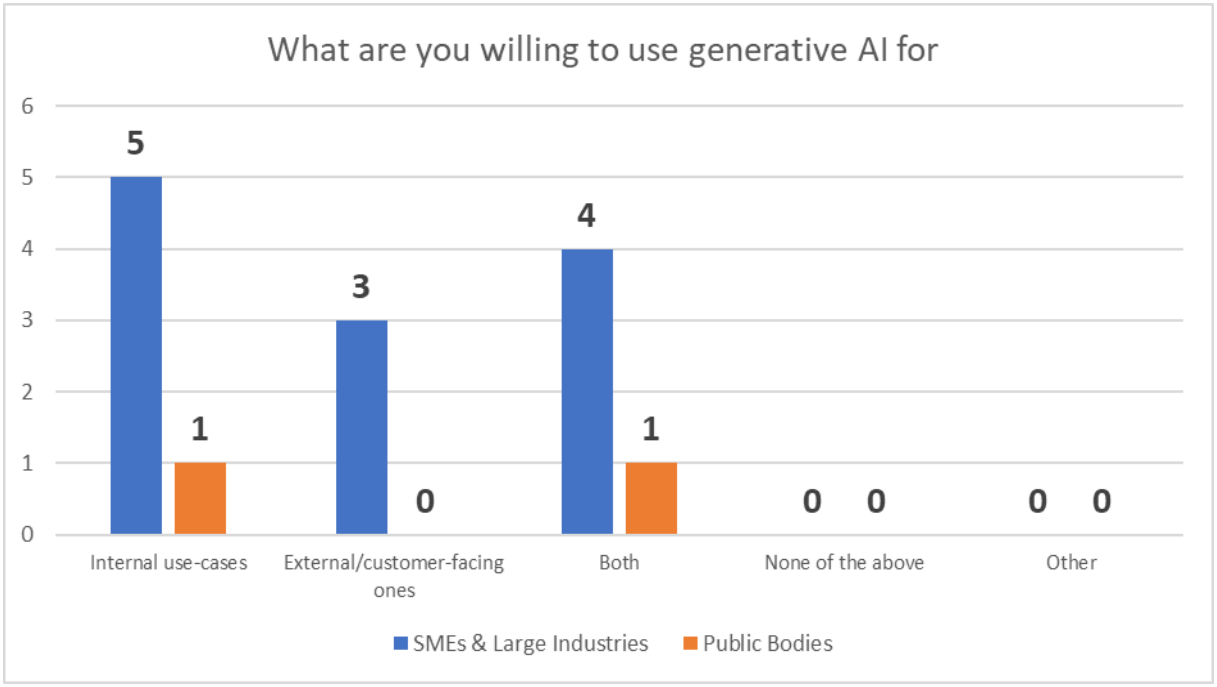
In terms of expected outcome, an equal number of 7 **companies** expect time saving and added value as the primary outcomes. The expectation of added value indicates that these companies believe Generative AI can bring additional benefits, such as improved content quality, enhanced decision-making, or novel insights.

Time saving was considered a priority by **public bodies** using Generative AI.



The analysis highlights the mixed experiences and perceptions of the **companies** regarding the progress and quality of their experiments with Generative AI. Four companies rated the results as "rather promising, but need improvement," indicating that while there is potential and promise in the outcomes, further refinement and enhancements are required to achieve desired levels of performance or quality. On the other hand, an equal number of four companies rated the results as "almost at production quality level," suggesting that these companies experienced promising results with their experiments and consider them to be very close to being deployable in a production environment.

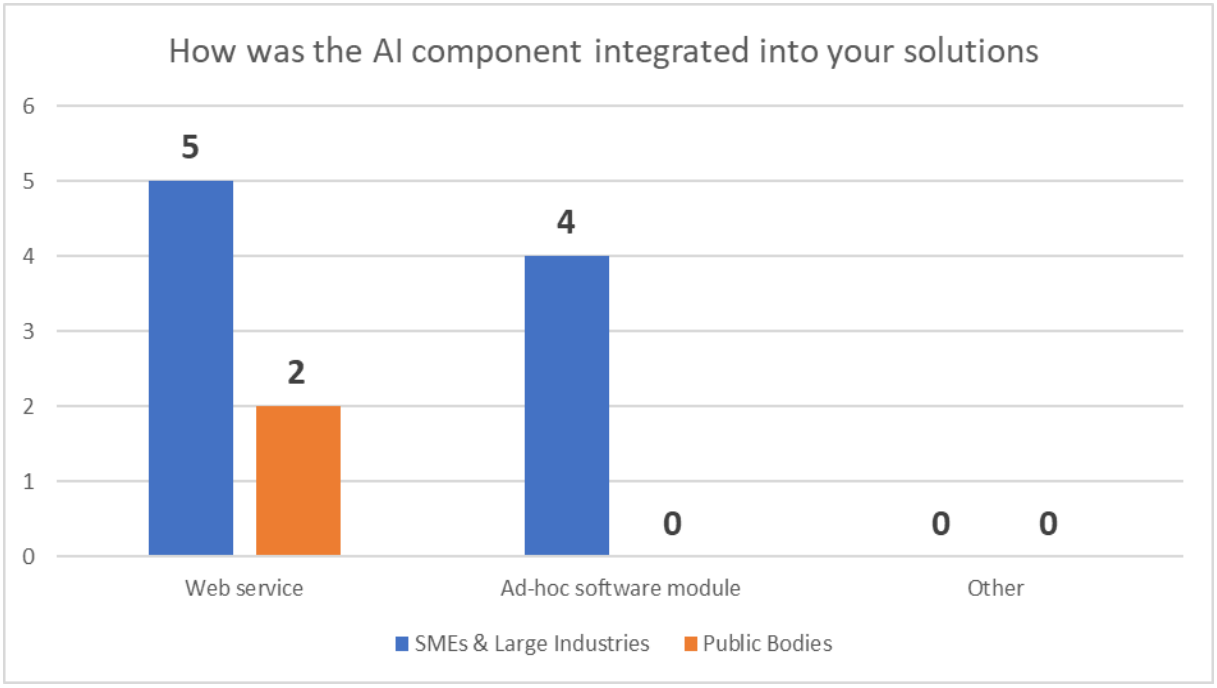
Public bodies are divided in their assessment of the use of Generative AI. They think it was either disappointing or rather promising but needs improvement.



The analysis highlights the diverse perspectives and strategic considerations among the surveyed **companies**, showcasing a mix of priorities in terms of utilizing Generative AI for internal operations and external-facing endeavors. Among the responses, 5 companies indicated their willingness to use Generative AI for internal use cases, suggesting a focus on improving internal processes, efficiency, or productivity within their organizations.

On the other hand, 3 companies expressed an interest in leveraging Generative AI for external or customer-facing use cases, implying a desire to enhance customer experiences, develop innovative products or services, or provide personalized offerings. Additionally, 4 companies selected both options, indicating a recognition of the potential value and applicability of Generative AI for both internal and external use cases.

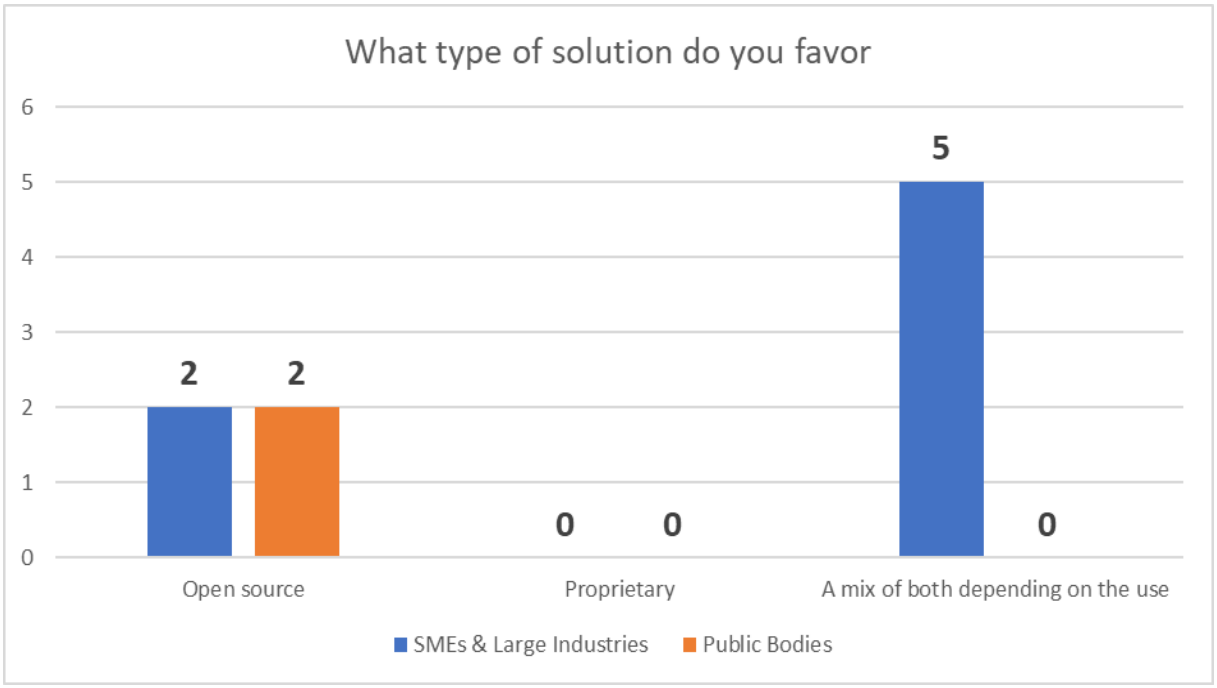
Public bodies are willing to use Generative AI both for internal and external use cases.



Among the responses, 5 **companies** indicated that they utilize web-based tools for integrating the Generative AI component. This suggests that these companies rely on existing web-based platforms or services that offer Generative AI capabilities, which could provide convenience, ease of access, and potential scalability.

On the other hand, 4 companies reported using an ad-hoc software module for integrating the Generative AI component. This implies that these companies have developed or customized their own software module specifically tailored to their needs, enabling more flexibility and control over the integration process.

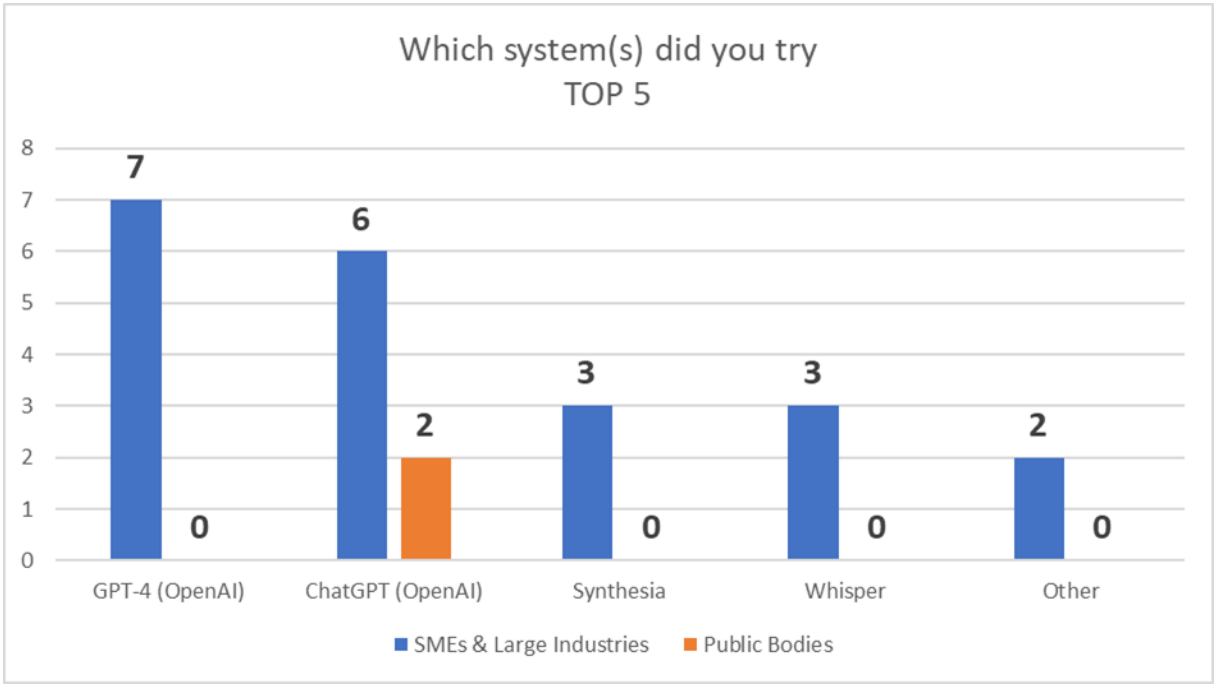
All **public bodies** responding to the survey have integrated the AI component as web service in their solutions.



While some companies lean towards open-source solutions, others adopt a more flexible approach by selecting a combination of both open-source and proprietary solutions based on the specific requirements and context of their use cases. This demonstrates the importance of considering various factors such as functionality, scalability, community support, and licensing when determining the preferred type of Generative AI solution for different applications.

Among the responses, 2 companies specifically selected open-source solutions as their favored choice. This indicates a preference for utilizing Generative AI solutions that are freely available, transparent, and benefit from a collaborative community-driven development process. On the other hand, 5 companies expressed a preference for a mix of both open-source and proprietary solutions, depending on the specific use case. This suggests that these companies recognize the value in leveraging open-source solutions when applicable, while also acknowledging the potential benefits of proprietary solutions that may offer specialized features, support, or customization options.

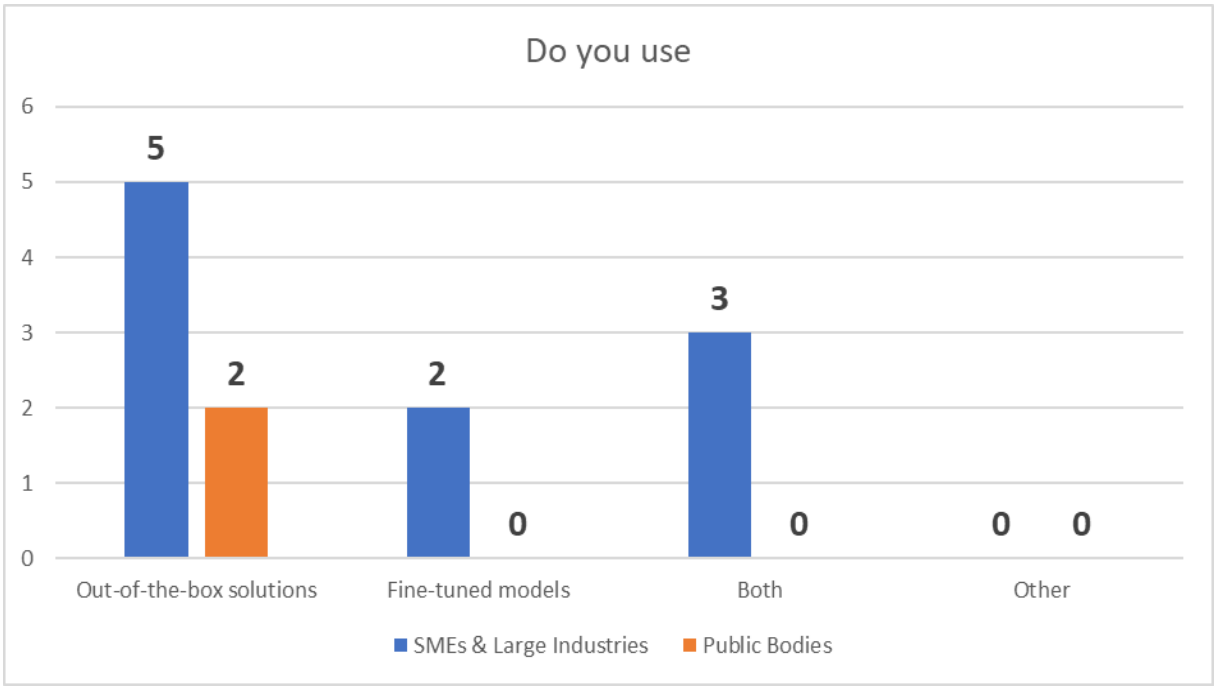
Public bodies expressed a strong preference for open-source solutions.



The analysis shows that the surveyed **companies have experimented with various Generative AI solutions.** Among the responses, the majority of companies (6) selected ChatGPT, indicating a significant interest in natural language processing and conversational AI.

Additionally, / companies tried GPT4, suggesting an eagerness to explore the advancements in the GPT series of models. Furthermore, 3 companies experimented with Synthesia, showcasing an interest in generating synthetic media content, and another 3 companies explored Whisper, highlighting an interest in voice and speech-related applications. Lastly, 2 companies mentioned trying other Generative AI solutions not specified in the survey options.

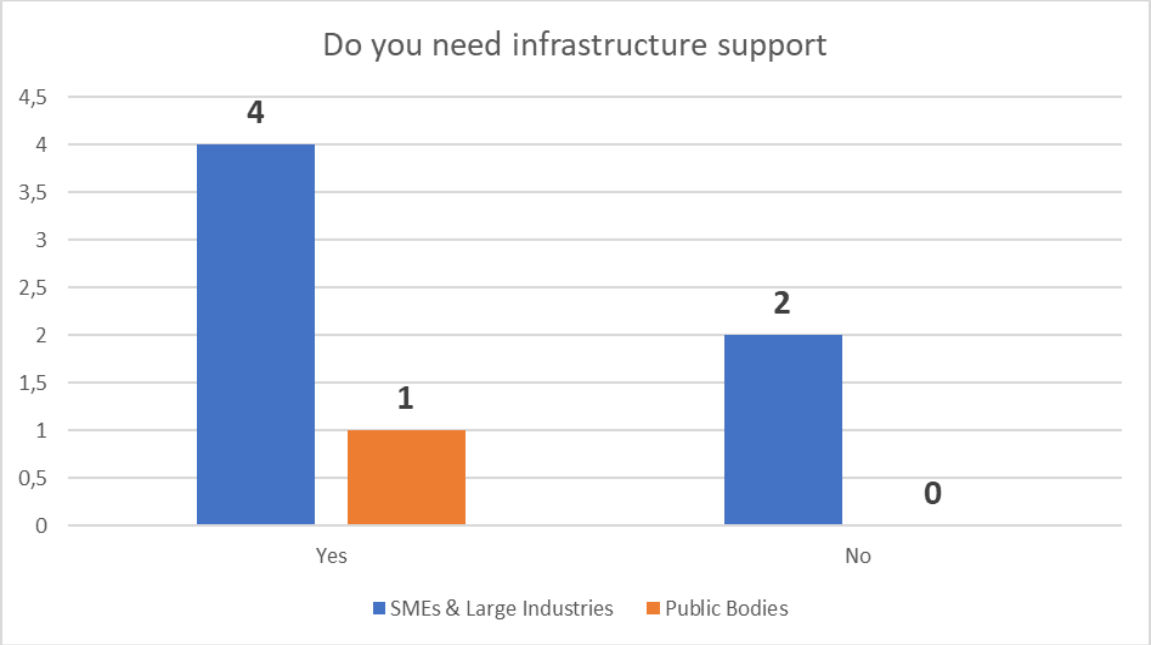
All **public bodies** answering the survey have chosen ChatGPT as the AI system to try.



Among the responses, 5 **companies** indicated a preference for using out-of-the-box solutions, which suggests a reliance on pre-trained models or ready-made Generative AI systems that require minimal customization. On the other hand, 2 companies selected fine-tuned models, indicating a preference for further refining and adapting pre-existing models to better suit their specific needs. Additionally, 3

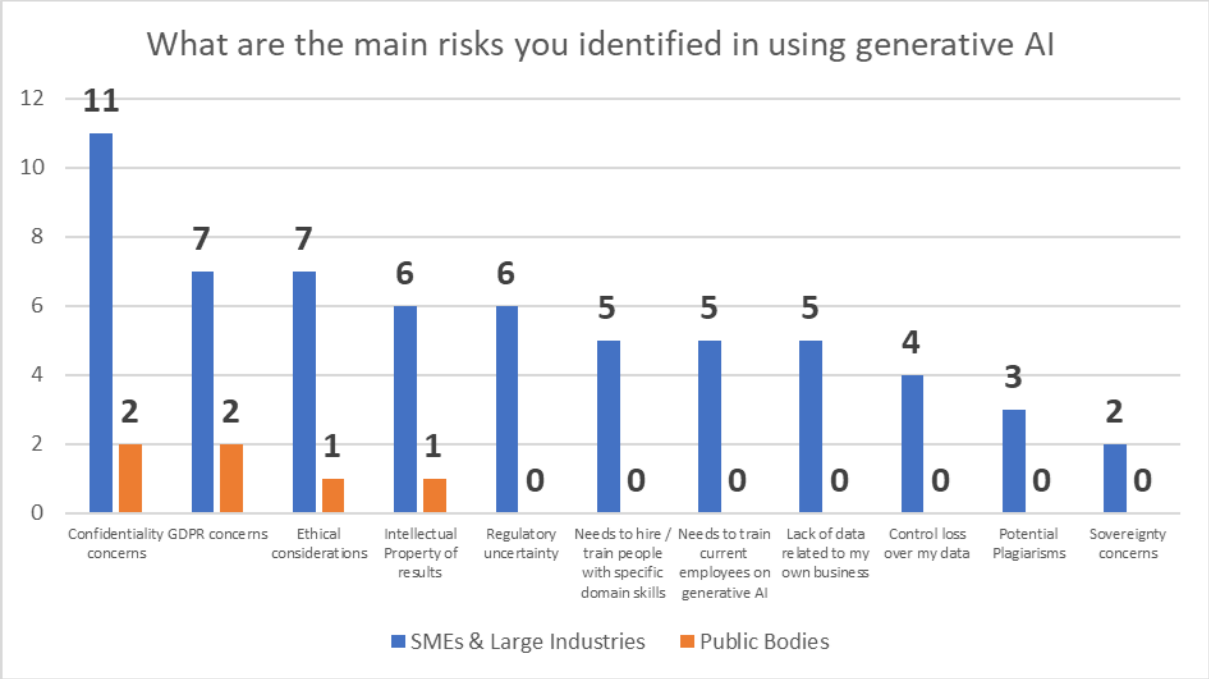
companies mentioned using both out-of-the-box solutions and fine-tuned models, indicating a hybrid approach where they leverage the benefits of both types of solutions depending on the requirements of their projects.

Public bodies have used out-of-the-box solutions rather than fine-tuned models.



The analysis highlights the varying needs and dependencies of companies when it comes to infrastructure support for their Generative AI endeavors, with some recognizing its importance while others manage without additional assistance. Specifically, 4 companies responded positively, indicating a desire for assistance with the necessary technological infrastructure to effectively implement and deploy their Generative AI solutions. On the other hand, 2 companies selected no, suggesting that they either have the required infrastructure in place or rely on alternative methods or resources for their Generative AI projects.

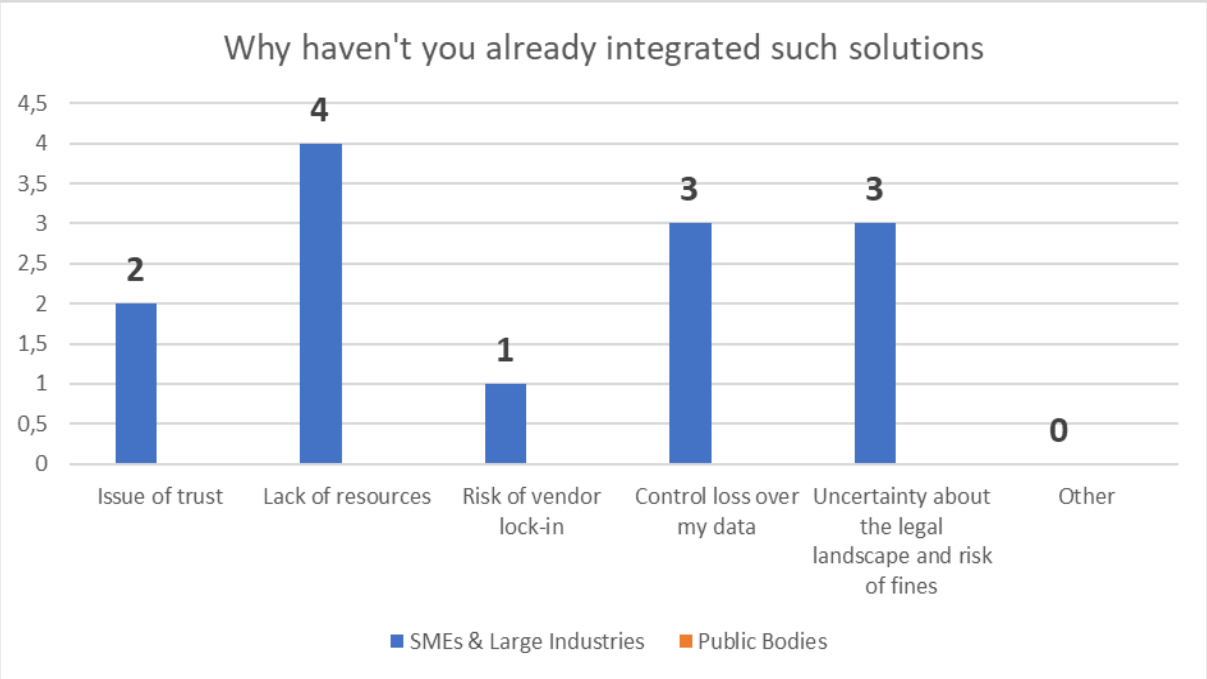
Public bodies have expressed the need for infrastructure support.



Based on the answers provided, it can be analyzed that the surveyed **companies** have identified several risks associated with the use of Generative AI. The most common concern expressed by the respondents is confidentiality, with 11 companies highlighting the potential risks to data security and sensitive information. GDPR concerns and ethical considerations follow closely, with 7 companies selecting each as significant risks, demonstrating a strong awareness of legal and ethical implications. Intellectual property of results and regulatory uncertainty are also identified by 6 companies each, indicating concerns related to ownership rights and compliance challenges. This analysis underscores the multifaceted nature of risks associated with Generative AI, encompassing legal, ethical, technical, and organizational considerations.

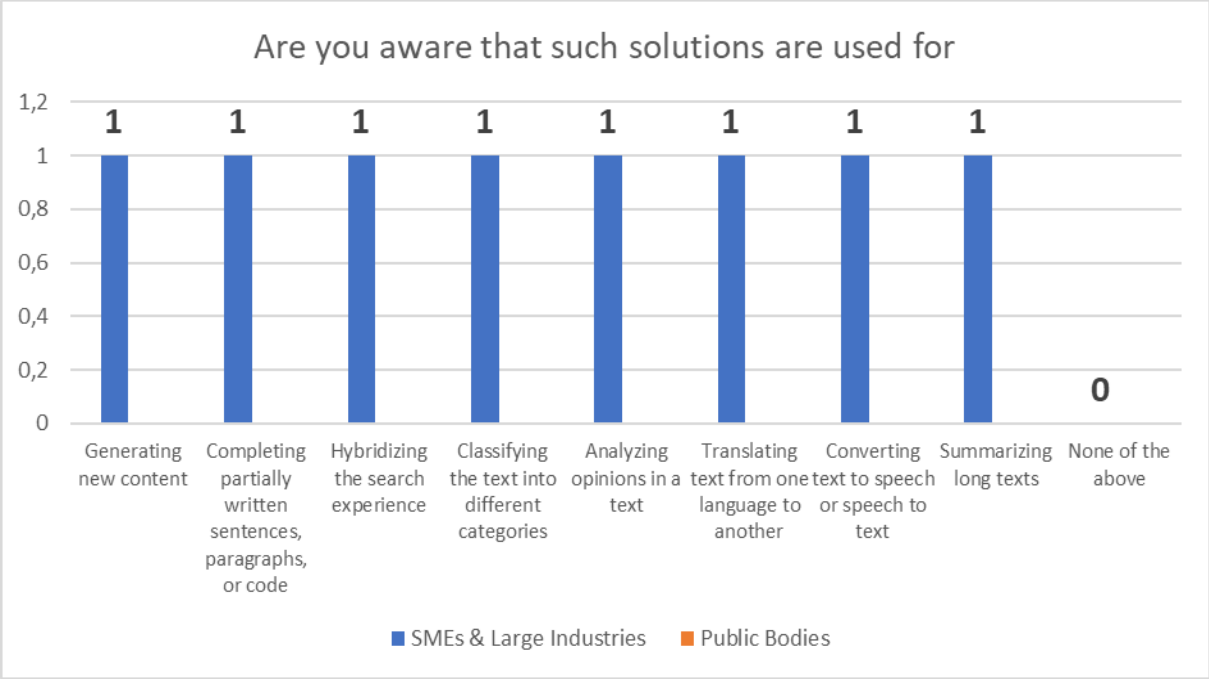
Out of all the risks that can spur from using Generative AI, **public bodies** are worried about: confidentiality concerns, GDPR concerns, intellectual property of results and ethical consideration.

The following question was only displayed for respondents who indicated the answer "We have not yet adopted such solutions, but are aware of their capabilities" to the first question "Did you try to use Generative AI in the context of your work?".



The most common reason expressed by the respondents is a lack of resources, with 4 companies indicating limited availability of necessary resources, such as budget, expertise, or infrastructure. Three companies selected uncertainty about the legal landscape and the risk of fines, highlighting concerns regarding compliance and potential legal implications associated with Generative AI. Control loss over data is another significant factor, with 3 companies expressing apprehension about relinquishing control over their data when using Generative AI solutions. Additionally, 2 companies mentioned issues of trust, indicating concerns about the reliability and accuracy of Generative AI systems, while 1 company identified the risk of vendor lock-in as a potential hindrance. This analysis reflects the diverse range of challenges and considerations that companies evaluate when deciding whether to integrate Generative AI solutions, including resource constraints, legal uncertainties, data control, trust, and vendor-related concerns.

The following question was only displayed for respondents who indicated the answer "We think these solutions are not relevant in our context" to the first question "Did you try to use Generative AI in the context of your work?".



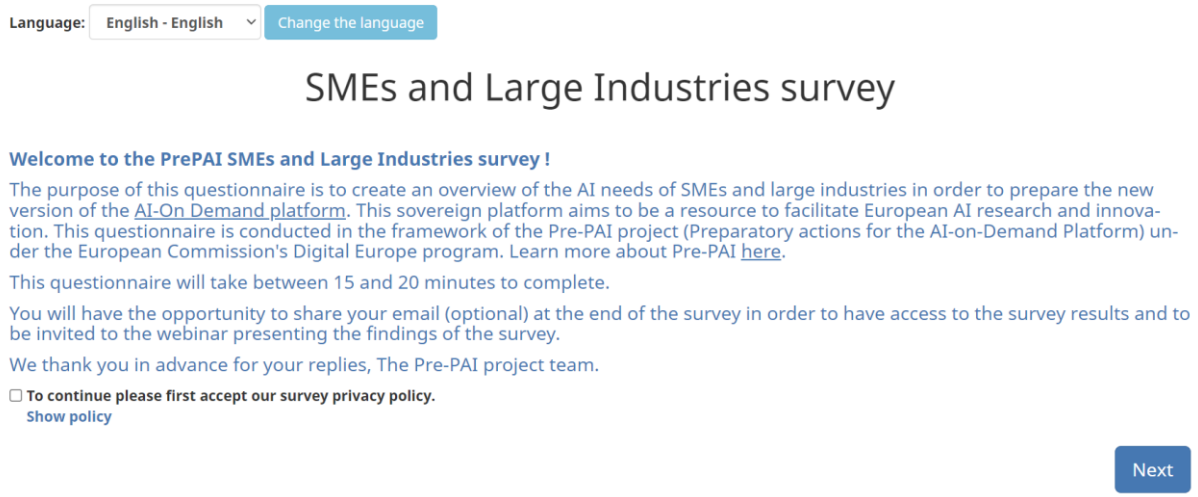
The analysis of responses suggests that while these companies acknowledge the potential benefits and functionalities of Generative AI, they have determined that the solutions do not align with their particular requirements or objectives, or that Generative AI solutions are not applicable or relevant within their specific context or business needs.

10.6 Questionnaire screenshots

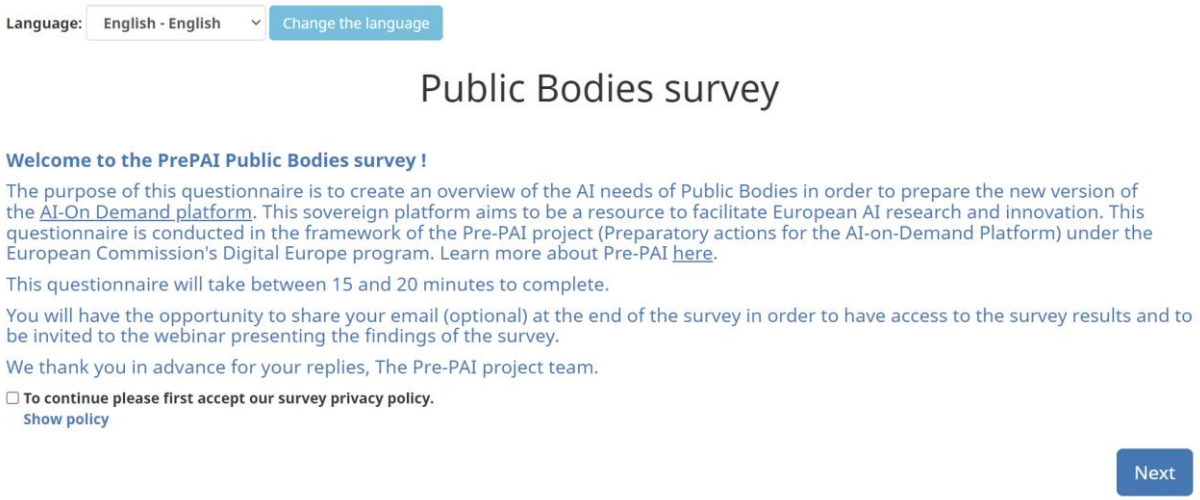
10.6.1 Welcome page

Note: this page is identical for the 3 versions (SME and large industries, public bodies and TEFs and DIHs, except for the title).

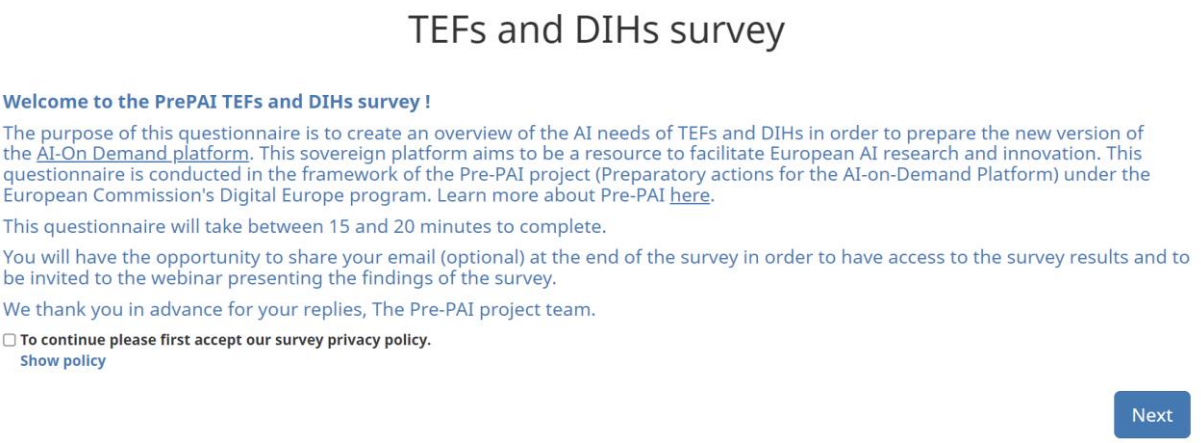
10.6.1.1 Welcome page – SMEs & large Industries version



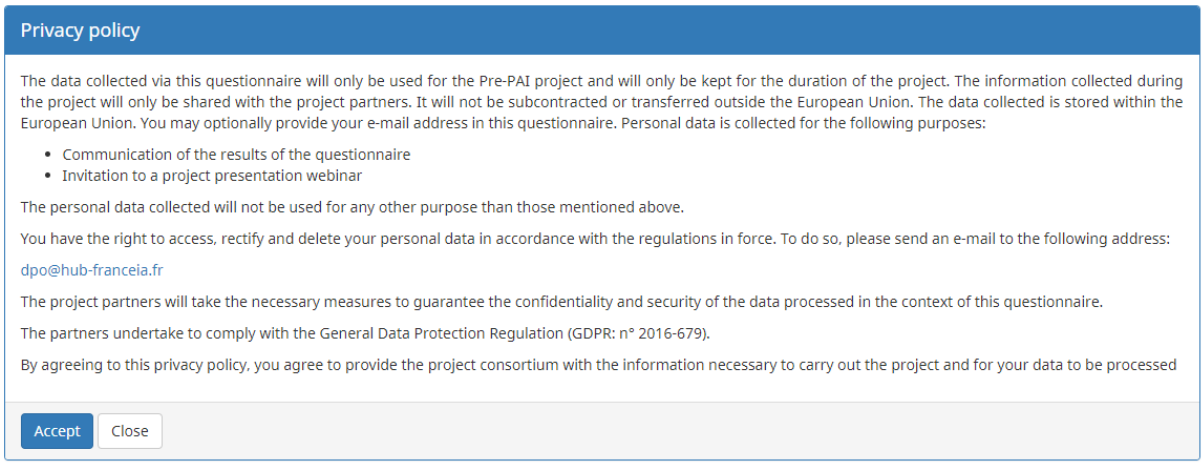
10.6.1.2 Welcome page – public bodies version



10.6.1.3 Welcome page – TEFs & DIHs version

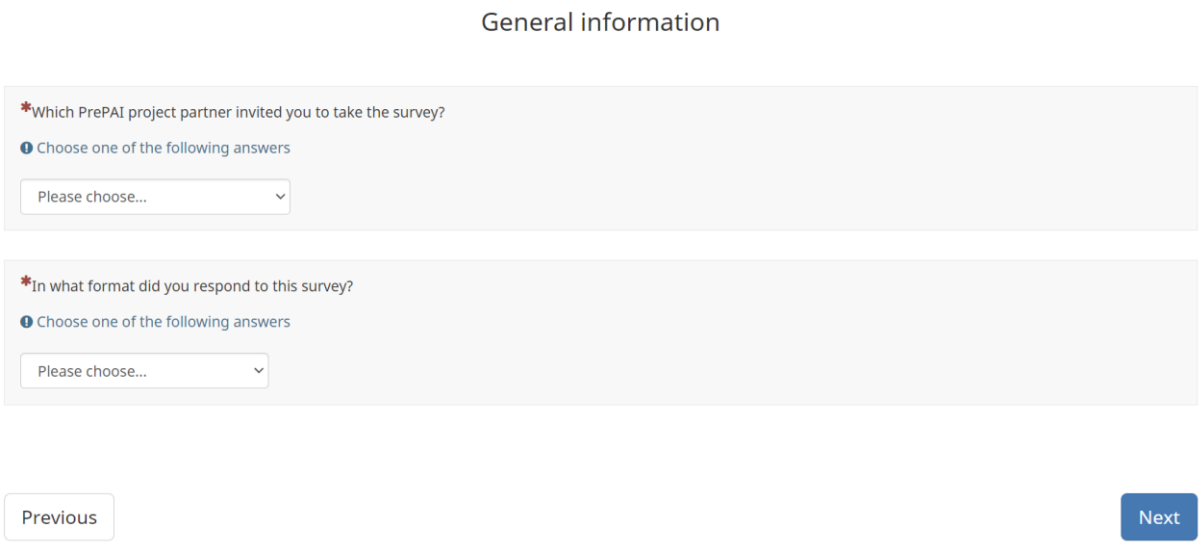


10.6.1.4 Privacy policy message (common to all versions)



10.6.2 General information page

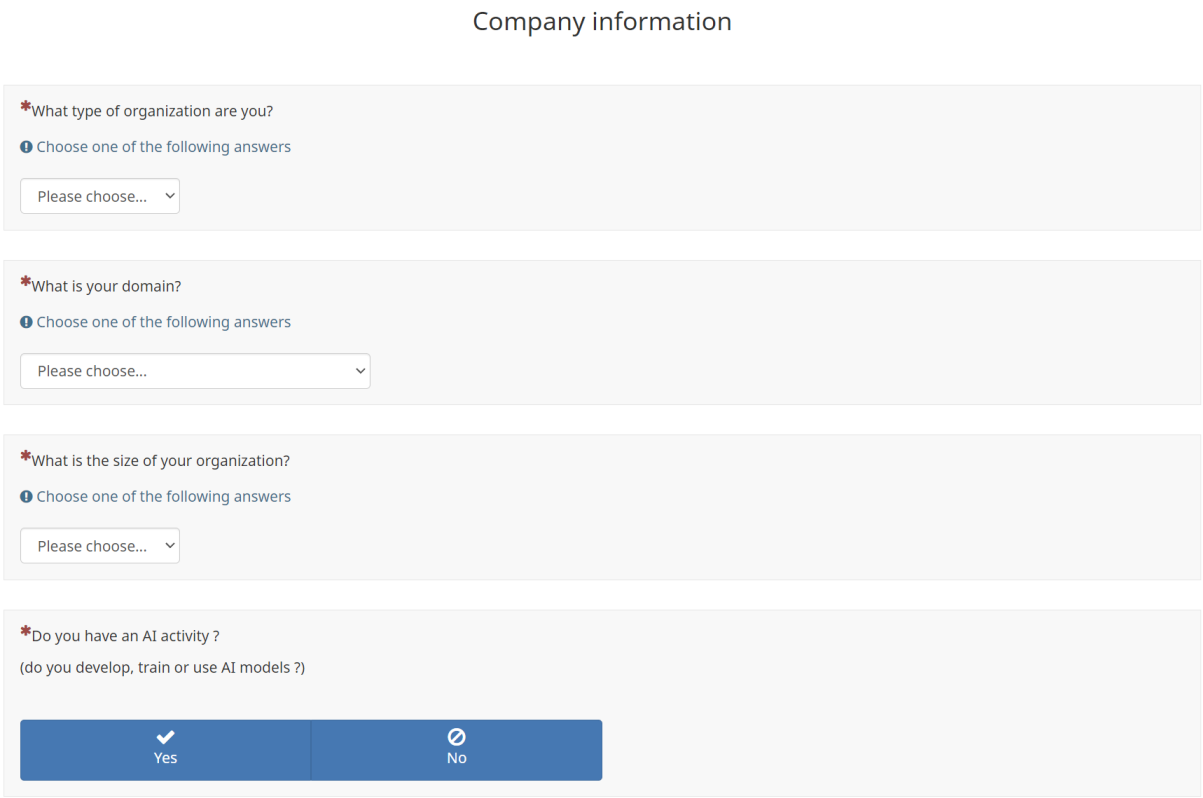
Note: this page is identical for the 3 versions SME and large industries, public bodies and TEFs and DIHs.

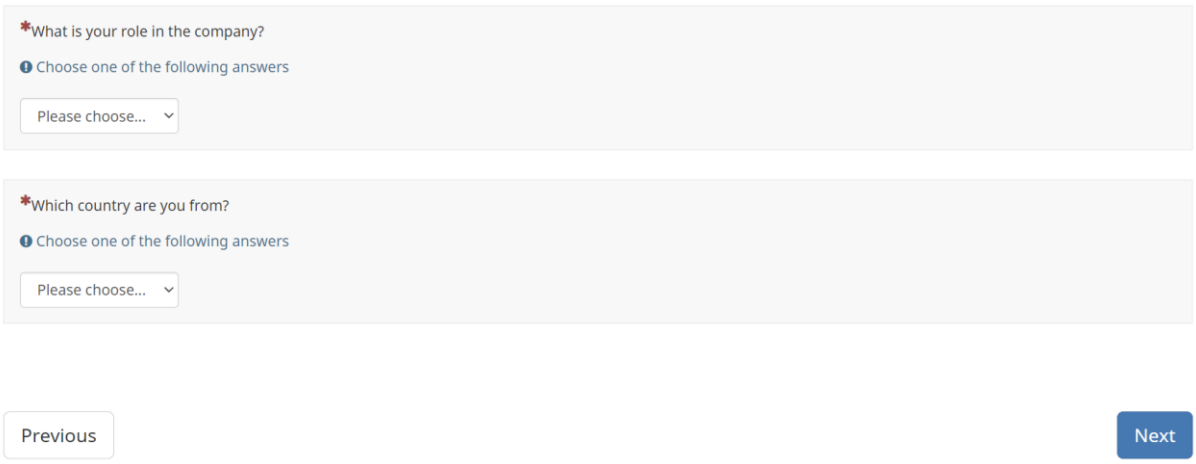


10.6.3 Company information page

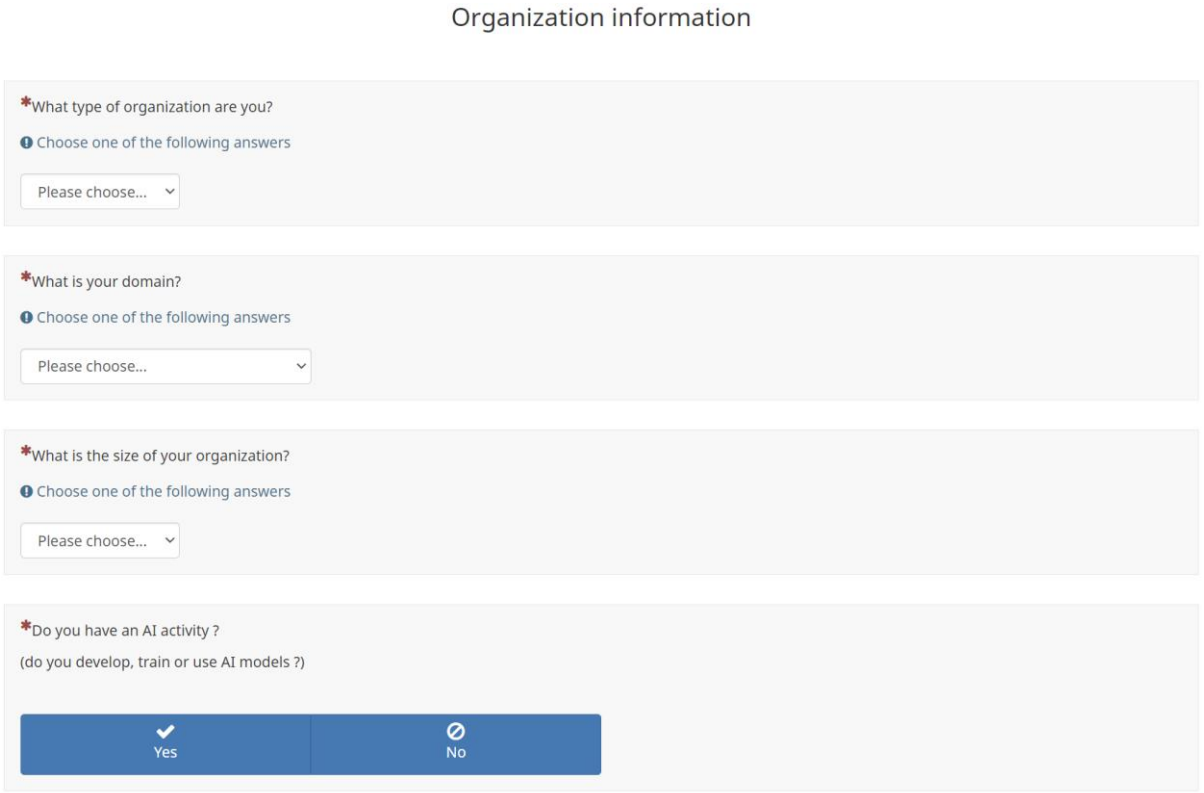
Note: this page contains some minor variations between the 3 versions.

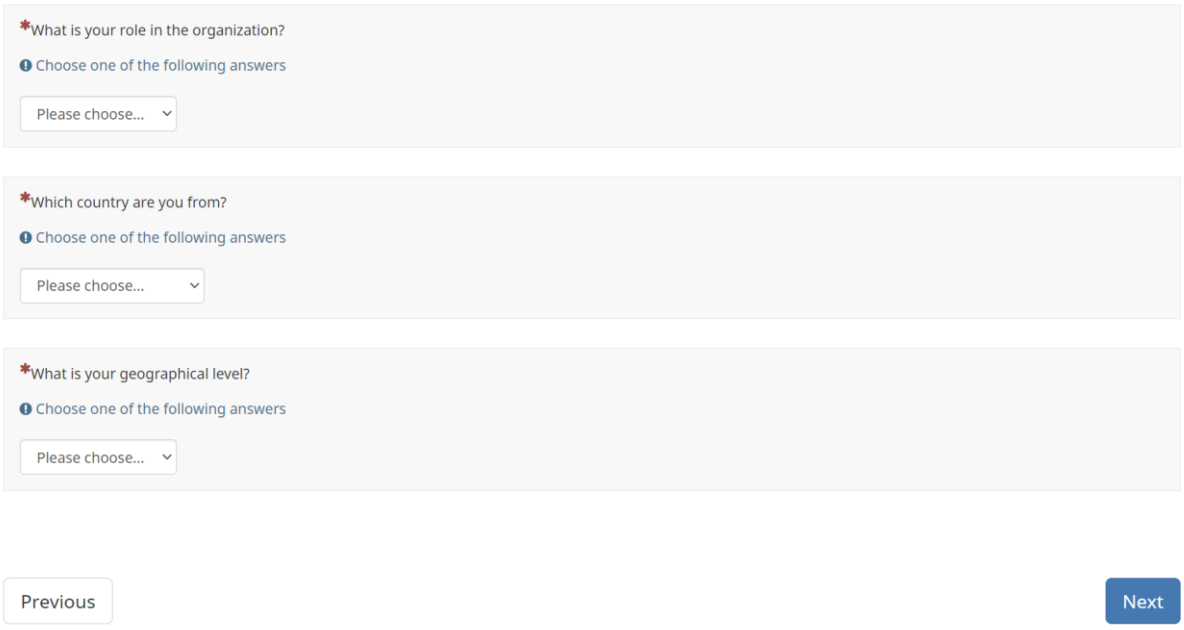
10.6.3.1 SMEs & large industries version



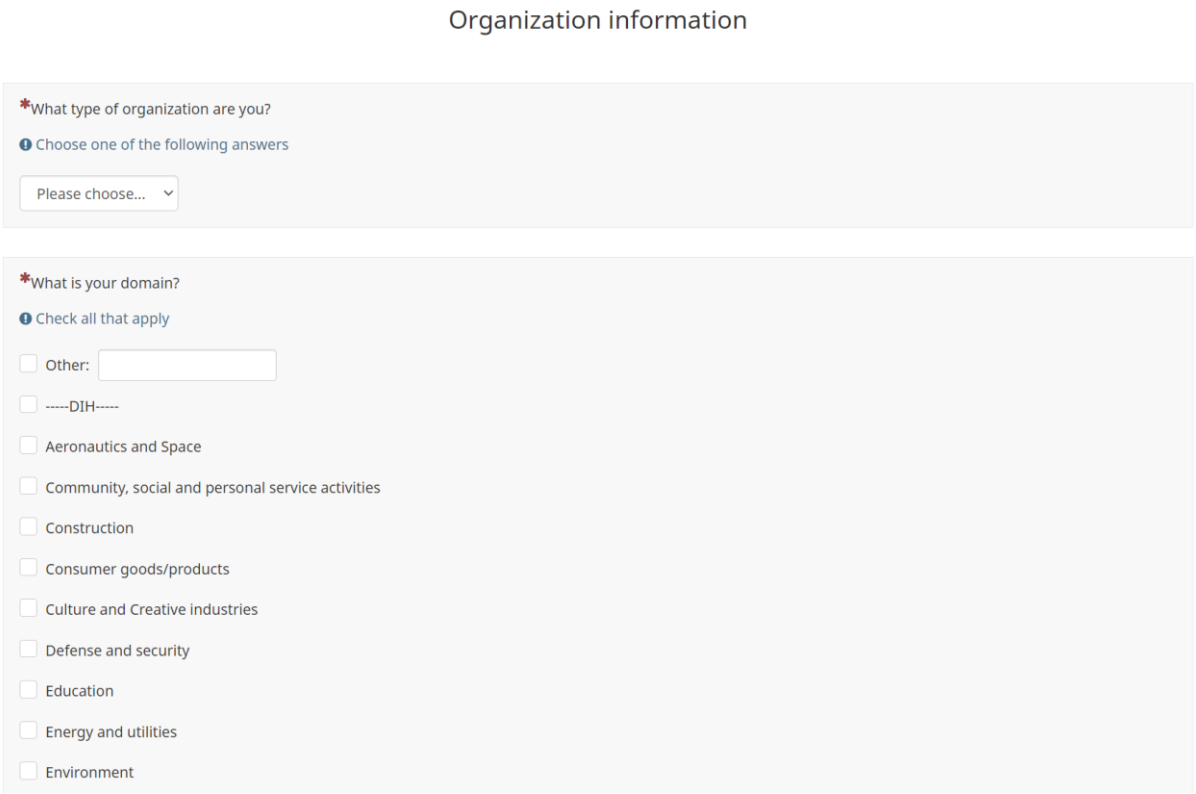


10.6.3.2 Public bodies version





10.6.3.3 TEFs & DIHs version



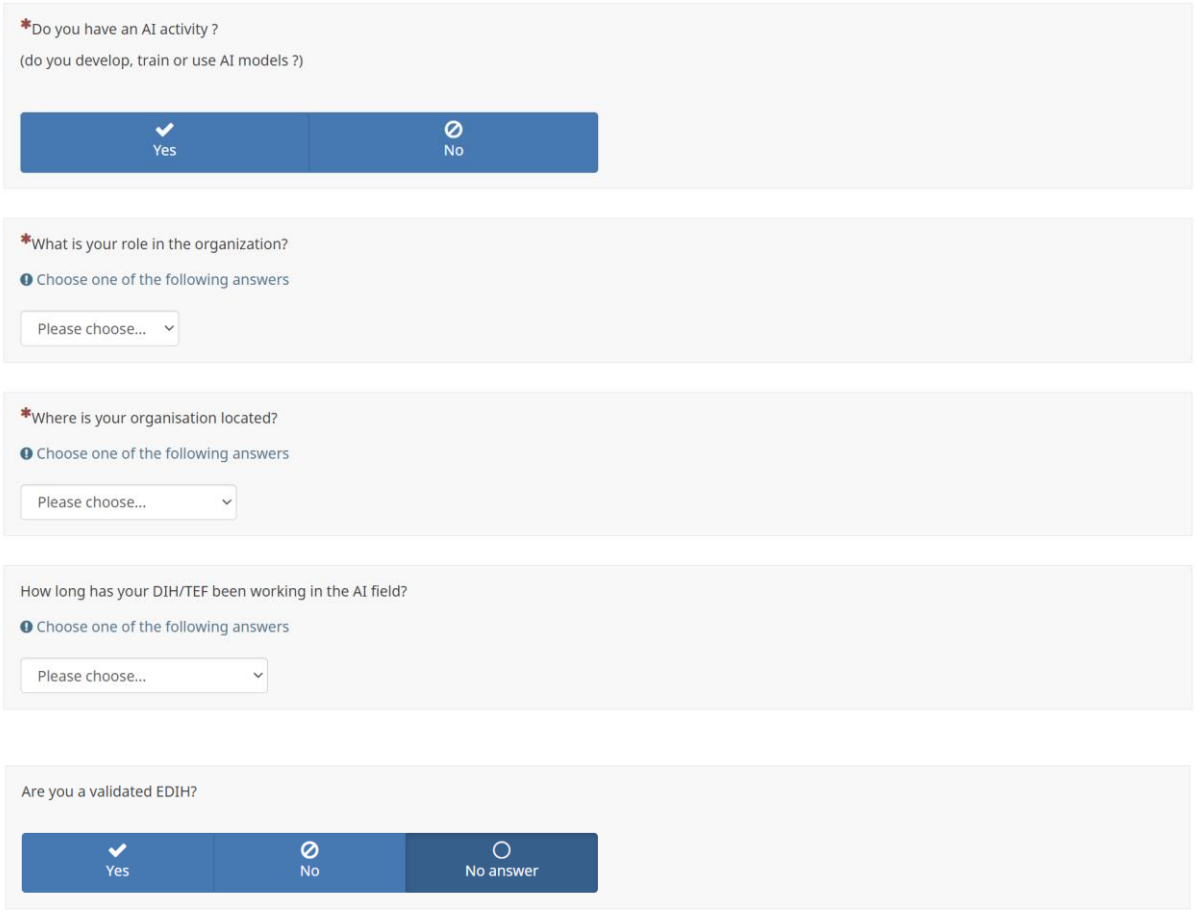
- [ ] Financial services
- [ ] Life sciences & healthcare
- [ ] Manufacture of basic metals and fabricated metal products
- [ ] Manufacture of chemicals, chemical products and man-made fibers
- [ ] Manufacture of coke, refined petroleum products and nuclear fuel
- [ ] Manufacture of electrical and optical equipment
- [ ] Manufacture of food products, beverages and tobacco
- [ ] Manufacture of leather and leather products
- [ ] Manufacture of machinery and equipment
- [ ] Manufacture of other non-metallic mineral products
- [ ] publishing and printing
- [ ] Manufacture of rubber and plastic products
- [ ] Manufacture of textiles and textile products
- [ ] Manufacture of transport equipment
- [ ] Manufacture of wood and wood products
- [ ] Maritime and fishery
- [ ] Mining and quarrying
- [ ] Mobility (incl. Automotive)
- [ ] Other Manufacturing

- [ ] Professional, Scientific and Technical Activities
- [ ] Public administration
- [ ] Real estate, renting and business activities
- [ ] Telecommunications, Information and Communication
- [ ] Tourism (incl. restaurants and hospitality)
- [ ] Transport and logistics
- [ ] Wholesale and retail
- [ ] -----TEF-----
- [ ] Agrifood
- [ ] Healthcare
- [ ] Smart Cities
- [ ] Manufacturing
- [ ] Edge

*What is the size of your organization?

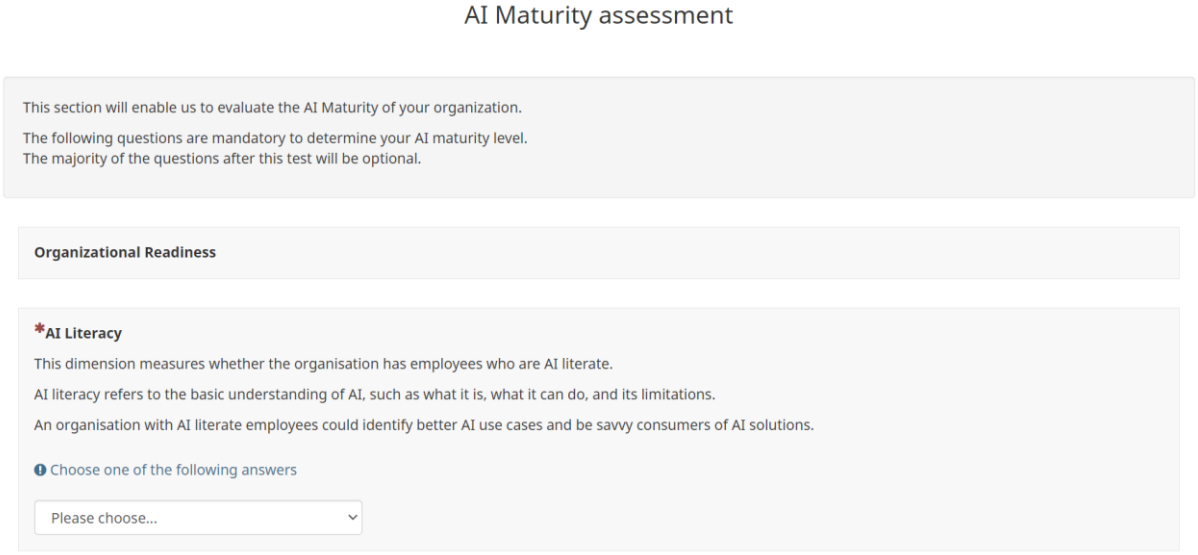
Choose one of the following answers

Please choose...



10.6.4 AI maturity assessment page

Note: this page contains some minor variations between the 3 versions.



*AI Talent

This dimension looks at the internal AI capabilities of an organization.

An organization with deep AI capabilities could build and maintain AI models. In contrast, an organization without AI capabilities could be a consumer of a ready-made AI solution.

Choose one of the following answers

Please choose...

*Management support

This dimension looks at whether there is management support for AI initiatives.

Proper organizational support, the right allocation of resources and the availability of an implementation roadmap backed up by the management is key to gaining enterprise-wide adoption of AI initiatives.

Choose one of the following answers

Please choose...

*Employee involvement in AI

This dimension looks at AI acceptance within the organization.

Without employees' trust and acceptance of AI-based systems, AI adoption within the organization will be hampered.

Choose one of the following answers

Please choose...

*Experimentation culture

Each AI project is experimentation, and the outcome of the AI project cannot be pre-determined.

An experimentation culture is necessary for employees to explore and develop AI use cases.

Choose one of the following answers

Please choose...

Ethics and Governance Readiness

*AI Governance

This dimension is about ensuring organization uses AI governance frameworks, managing all the different aspects across the AI lifecycle to avoid disfunction or malevolent use. An organisation looking to deploy AI solutions must ensure there is appropriate governance to avoid unintentionally harming end-users.

Choose one of the following answers

Please choose...

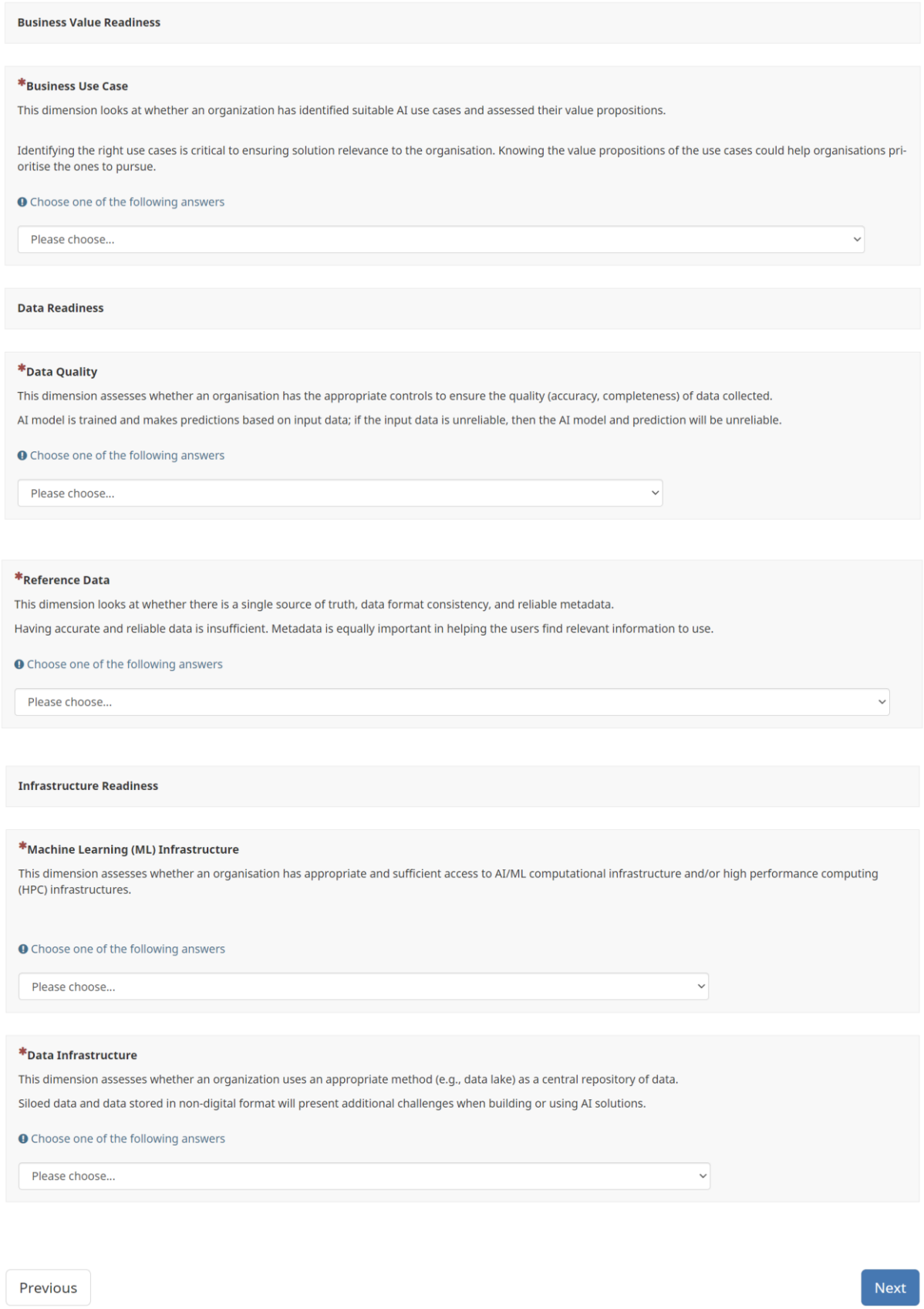
*AI Risk Control

This dimension assesses whether the organization has a proper classification of the risk level of AI systems.

Proper risk classification of AI systems will help the organization determine appropriate controls and measures. For instance, AI applications in high-risk use cases would require more oversight to prevent AI from unintentionally causing harm to end-users.

Choose one of the following answers

Please choose...



10.6.5 Useful functionalities page

Note: this page contains significant variations between the 3 versions to include more relevant functionalities for each type of stakeholder.

10.6.5.1 SMEs & large industries – AI aware version

You are AI ready

Which means that you are certainly able to :
- develop customized AI solutions for specific business needs
- develop a roadmap for AI implementation
- develop customized AI model for unique business needs

Contacts

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

Definition of TEF
Testing and Experimentation Facility (TEF) is a technology infrastructure that has specific expertise and experience of testing mature technology in a given sector, under real or close to real conditions

Definition of DIH
Digital Innovation Hubs (DIHs) can help ensure that every company, small or large, high-tech or not, can take advantage of digital opportunities. DIHs are one-stop shops that help companies become more competitive with regard to their business/production processes, products or services using digital technologies. DIHs provide access to technical expertise and experimentation, so that companies can "test before invest". They also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation.

	1	2	3	4	5	No answer
have access to AI solutions providers fitted to your needs, by category?	○	○	○	○	○	●
have access to VCs (Venture Capitalists)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
be introduced to (or interact with) like-minded companies?	○	○	○	○	○	●
be introduced to (or interact with) researchers fitted to your needs?	○	○	○	○	○	●
participate in the AI community through forums (for sharing results, tools and solutions from the broader European AI community)?	○	○	○	○	○	●
have access to a TEF (Testing and Experimentation Facility)?	○	○	○	○	○	●
have access to a DIH (Digital Innovation Hub)?	○	○	○	○	○	●

Content

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to success stories on AI projects?	○	○	○	○	○	●
have access to best practices and guidelines documents?	○	○	○	○	○	●
have access to a selection of articles on AI in the press?	○	○	○	○	○	●
have access to a selection of papers on AI applications?	○	○	○	○	○	●
have access to a selection of academic research papers?	○	○	○	○	○	●

Data

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

Definition of data space
A data space is a decentralised infrastructure for trustworthy data sharing and exchange in data ecosystems, based on commonly agreed principles. It is thus a type of data relationship between trusted partners who adhere to the same high standards and guidelines when it comes to data storage and sharing

	1	2	3	4	5	No answer
have access to existing datasets?	○	○	○	○	○	●
know about existing data spaces in your domain?	○	○	○	○	○	●
know about existing initiatives for data sharing?	○	○	○	○	○	●
have methods to assess your data quality?	○	○	○	○	○	●

Training

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have autonomous access to basic training modules on AI?	○	○	○	○	○	●
have autonomous access to basic training modules on applications of AI to your domain?	○	○	○	○	○	●
have autonomous access to advanced training modules on AI?	○	○	○	○	○	●
have autonomous access to training on Trustworthy AI, including AI regulation?	○	○	○	○	○	●
have autonomous access to a catalogue of best practices for learning AI skills?	○	○	○	○	○	●

Services (offered by providers)

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have easy access to coaching services?	○	○	○	○	○	●
benefit from training services?	○	○	○	○	○	●
benefit from advanced training services?	○	○	○	○	○	●
have access to support in assisting with data acquisition, data processing, and data analysis?	○	○	○	○	○	●
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	○	○	○	○	○	●
have services that helps you to assess the quality of the AI model?	○	○	○	○	○	●
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	○	○	○	○	○	●
benefit from ethical services to address the trustworthiness of AI applications?	○	○	○	○	○	●

Funding programs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have acccess to a map of funding sources?	○	○	○	○	○	●
be informed of project proposals?	○	○	○	○	○	●
be informed of AI challenges?	○	○	○	○	○	●
be informed of current and future public funding or cascade funding opportunities?	○	○	○	○	○	●

Jobs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
be informed of open job offers in the field of AI?	○	○	○	○	○	●
post job offers in the field of AI?	○	○	○	○	○	●

Events

How important would it be for you to be informed of :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
research events in the field of AI?	○	○	○	○	○	●
professional fairs in the field of AI?	○	○	○	○	○	●
EC-organized events in the field of AI?	○	○	○	○	○	●
related initiatives launched in the field of AI?	○	○	○	○	○	●
regulation updates in the field of AI?	○	○	○	○	○	●

Technical tools

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
search contents through a search engine (by categories, authors, filters...)?	○	○	○	○	○	●

Technical tools

Do you develop and train AI models?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Do you use AI for inference and application?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to AI libraries (to help you develop AI models)?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to data cleaning tools?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to AI bricks ready-to-use / packaged models?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Where would you like to have access to AI infrastructures for test?

Check all that apply

- [ ] Dedicated centers
- [ ] DIHs
- [ ] TEFs
- [ ] None

Technical tools

Would you like to have access to tools to help you comply with AI regulation (AI Act)?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to regulatory sandboxes (allows the testing of AI models that are not fully compliant with the existing regulatory framework)?

✔ Yes | ⊘ No | ○ No answer

Technical tools

What types of AI algorithm do you use?

Check all that apply

- [ ] Linear regression
- [ ] Logistic regression
- [ ] Decision Trees
- [ ] Naive Bayes
- [ ] Support Vector Machines
- [ ] Random Forest
- [ ] Bagging
- [ ] Boosting
- [ ] Gradient Boosting
- [ ] Arima
- [ ] Clustering
- [ ] K-nearest Neighbors
- [ ] K-means
- [ ] Neural Networks
- [ ] Convolutional Neural Networks
- [ ] Deep Neural Networks
- [ ] Recurrent Neural Networks
- [ ] Transformers
- [ ] GAN (Generative Adversarial Networks)
- [ ] Reinforcement learning
- [ ] Natural Language Processing
- [ ] Image Processing
- [ ] Speech Processing
- [ ] Audio Processing
- [ ] Recommender systems
- [ ] Knowledge-Graphs
- [ ] Logical rules
- [ ] Agent-based
- [ ] Optimization
- [ ] Other:

Tehnical tools

What types of large pre-trained models do you use?

Check all that apply

- [ ] Image (eg YOLO...)
- [ ] Text (eg GPT, BERT...)
- [ ] Speech
- [ ] Audio
- [ ] None
- [ ] Other:

Technical tools

How do you deliver your AI apps, products, services for execution/production?

Check all that apply

- [ ] Executable (.exe)
- [ ] Jupyter Notebook
- [ ] Docker Container
- [ ] ONNX
- [ ] Library
- [ ] Open Source
- [ ] Embedded in a Saas offer (eg. 'enduser' UX in more complex application)
- [ ] Saas for AI service (eg. GPTx)
- [ ] Paas embedding AI components (eg. 'developer oriented platform' to develop AI powered application)
- [ ] Other:

Technical tools

Do your AI apps, products, services require one or multiple GPUs?

Check all that apply

- [ ] Yes, for training
- [ ] Yes, for inference/application
- [ ] No

Tehnical tools

What technology is used for the public interface of your AI apps, products, services (as used by a customer/user)?

Check all that apply

- [ ] Graphical User Interface
- [ ] RESTful interface (e.g. HTTP and JSON or XML)
- [ ] ROS
- [ ] GRPC/Protobuf
- [ ] Specific client library
- [ ] Files (Batch processing)
- [ ] Other:

Technical tools

Do you use MLOps tools?

Check all that apply

- [ ] Kubeflow
- [ ] Airflow
- [ ] AutoML
- [ ] Pachyderm
- [ ] DVC
- [ ] Other:

Technical tools

Do you use AI-Services in the Cloud?

Check all that apply

- [ ] Amazon Sagemaker
- [ ] Microsost Azure
- [ ] OpenAI
- [ ] Huggingface
- [ ] OVH
- [ ] Other:

Techincal tools

Do you own any IT System / platform able to expose data and / or functionalities (e.g. via APIs)?

Yes	No	No answer

Technical tools

Could you briefly summarise from a technical point of view how data and functionalities are / could be exposed? (e.g. REST APIs, etc.)?

Technical tools

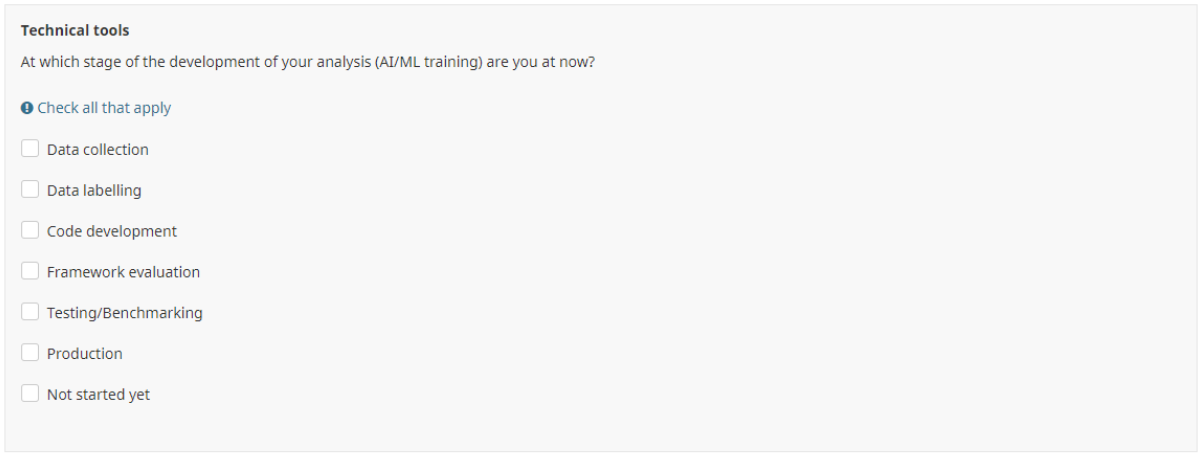
Do you see any potential benefits from the integration of your IT System with the AI Platform? Could you briefly describe your expected benefits?

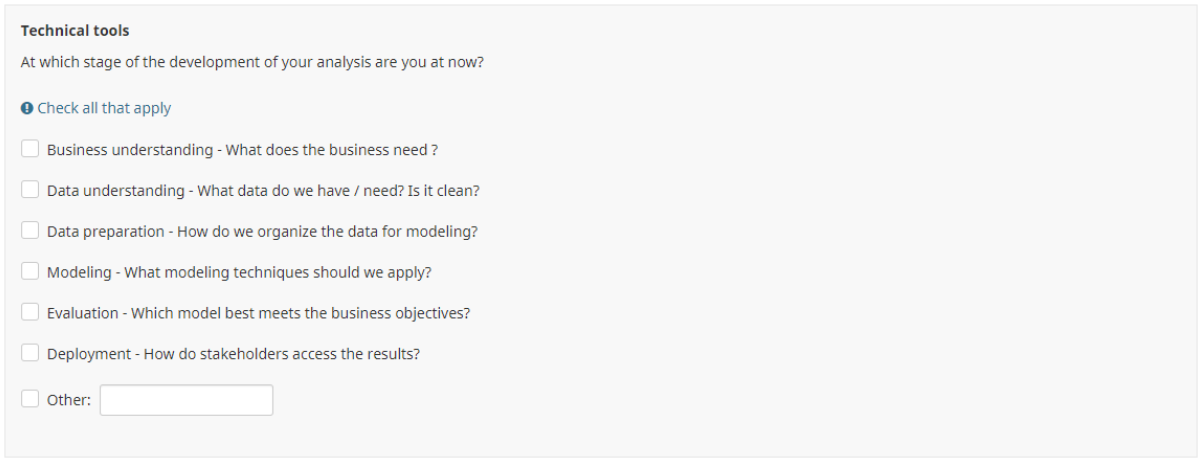
Technical tools

Which are the main problems connected with the execution of your analysis (AI/ML training)?

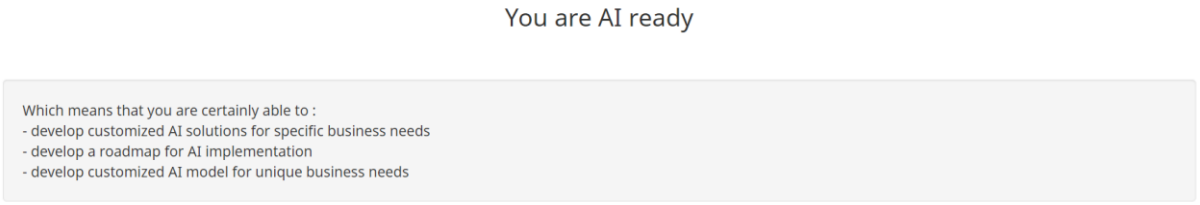
Check all that apply

- [ ] Lack of data
- [ ] Lack of resources
- [ ] Resource instability
- [ ] Lack of competences
- [ ] Not detected any specific problems yet
- [ ] Other:





10.6.5.2 SMEs & large industries – AI unaware version



Contacts

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

Definition of TEF
Testing and Experimentation Facility (TEF) is a technology infrastructure that has specific expertise and experience of testing mature technology in a given sector, under real or close to real conditions

Definition of DIH
Digital Innovation Hubs (DIHs) can help ensure that every company, small or large, high-tech or not, can take advantage of digital opportunities. DIHs are one-stop shops that help companies become more competitive with regard to their business/production processes, products or services using digital technologies. DIHs provide access to technical expertise and experimentation, so that companies can "test before invest". They also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation.

	1	2	3	4	5	No answer
have access to AI solutions providers fitted to your needs, by category?	○	○	○	○	○	●
have access to VCs (Venture Capitalists)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
be introduced to (or interact with) like-minded companies?	○	○	○	○	○	●
be introduced to (or interact with) researchers fitted to your needs?	○	○	○	○	○	●
participate in the AI community through forums (for sharing results, tools and solutions from the broader European AI community)?	○	○	○	○	○	●
have access to a TEF (Testing and Experimentation Facility)?	○	○	○	○	○	●
have access to a DIH (Digital Innovation Hub)?	○	○	○	○	○	●

Content

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to success stories on AI projects?	○	○	○	○	○	●
have access to best practices and guidelines documents?	○	○	○	○	○	●
have access to a selection of articles on AI in the press?	○	○	○	○	○	●
have access to a selection of papers on AI applications?	○	○	○	○	○	●
have access to a selection of academic research papers?	○	○	○	○	○	●

Training

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have autonomous access to basic training modules on AI?	○	○	○	○	○	●
have autonomous access to basic training modules on applications of AI to your domain?	○	○	○	○	○	●
have autonomous access to advanced training modules on AI?	○	○	○	○	○	●
have autonomous access to training on Trustworthy AI, including AI regulation?	○	○	○	○	○	●
have autonomous access to a catalogue of best practices for learning AI skills?	○	○	○	○	○	●

Services (offered by providers)

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have easy access to coaching services?	○	○	○	○	○	●
benefit from training services?	○	○	○	○	○	●
benefit from advanced training services?	○	○	○	○	○	●
have access to support in assisting with data acquisition, data processing, and data analysis?	○	○	○	○	○	●
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	○	○	○	○	○	●
have services that helps you to assess the quality of the AI model?	○	○	○	○	○	●
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	○	○	○	○	○	●
benefit from ethical services to address the trustworthiness of AI applications?	○	○	○	○	○	●

Funding programs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have acccess to a map of funding sources?	○	○	○	○	○	●
be informed of project proposals?	○	○	○	○	○	●
be informed of AI challenges?	○	○	○	○	○	●
be informed of current and future public funding or cascade funding opportunities?	○	○	○	○	○	●

Jobs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
be informed of open job offers in the field of AI?	○	○	○	○	○	●
post job offers in the field of AI?	○	○	○	○	○	●

Events

How important would it be for you to be informed of :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
research events in the field of AI?	○	○	○	○	○	●
professional fairs in the field of AI?	○	○	○	○	○	●
EC-organized events in the field of AI?	○	○	○	○	○	●
related initiatives launched in the field of AI?	○	○	○	○	○	●
regulation updates in the field of AI?	○	○	○	○	○	●

Previous

Next

10.6.5.3 Public bodies – AI aware version

You are AI ready

Which means that you are certainly able to :
- develop customized AI solutions for specific business needs
- develop a roadmap for AI implementation
- develop customized AI model for unique business needs

*How many AI tools or solutions has your organization adopted?

Choose one of the following answers

One

The following questions will refer to the AI tool(s) you adopted. In case you adopted more than one, you'll be asked to answer the same set of questions for each AI tool

*Can you describe the AI tool or solution adopted? (name and short description)

*Could you specify in which development phase the AI tool or solution is?

Choose one of the following answers

Please choose...

*For which of the following use cases was the AI tool or solution adopted?

Check all that apply

- [ ] Audio processing
- [ ] Chatbots, intelligent digital assistants, virtual agents and recommendation systems
- [ ] Cognitive robotics, process automation and connected and automated vehicles
- [ ] Computer vision and identity recognition
- [ ] Expert and rule-based systems, algorithmic decision making
- [ ] AI-empowered knowledge management
- [ ] ML, deep learning
- [ ] NLP, text mining, and speech analytics
- [ ] Predictive analytics, simulation and data visualisation
- [ ] Security analytics and threat intelligence
- [ ] Other:

*Was the AI tool or solution open source or proprietary?

Choose one of the following answers

Please choose...

*Can you describe the procurement procedure you followed?

Choose one of the following answers

Please choose...

*Could you share any link or written information about the procurement procedure?

*For which of the following objectives of the public sector do you expect to find significant support in the platform?

Check all that apply

- [ ] Improving the internal efficiency of public administration processes
- [ ] Improving public administration decision making
- [ ] Improving citizen-government relations
- [ ] Other:

Contacts

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

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	1	2	3	4	5	No answer
have access to AI solutions providers fitted to your needs, by category?	○	○	○	○	○	●
have access to VCs (Venture Capitalists)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
be introduced to (or interact with) like-minded companies?	○	○	○	○	○	●
be introduced to (or interact with) researchers fitted to your needs?	○	○	○	○	○	●
participate in the AI community through forums (for sharing results, tools and solutions from the broader European AI community)?	○	○	○	○	○	●
have access to a TEF (Testing and Experimentation Facility)?	○	○	○	○	○	●
have access to a DIH (Digital Innovation Hub)?	○	○	○	○	○	●

Content

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to success stories on AI projects?	○	○	○	○	○	●
have access to best practices and guidelines documents?	○	○	○	○	○	●
have access to a selection of articles on AI in the press?	○	○	○	○	○	●
have access to a selection of papers on AI applications?	○	○	○	○	○	●
have access to a selection of academic research papers?	○	○	○	○	○	●

Data

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

Definition of data space
A data space is a decentralised infrastructure for trustworthy data sharing and exchange in data ecosystems, based on commonly agreed principles. It is thus a type of data relationship between trusted partners who adhere to the same high standards and guidelines when it comes to data storage and sharing

	1	2	3	4	5	No answer
have access to existing datasets?	○	○	○	○	○	●
know about existing data spaces in your domain?	○	○	○	○	○	●
know about existing initiatives for data sharing?	○	○	○	○	○	●
have methods to assess your data quality?	○	○	○	○	○	●

Training

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have autonomous access to basic training modules on AI?	○	○	○	○	○	●
have autonomous access to basic training modules on applications of AI to your domain?	○	○	○	○	○	●
have autonomous access to advanced training modules on AI?	○	○	○	○	○	●
have autonomous access to training on Trustworthy AI, including AI regulation?	○	○	○	○	○	●
have autonomous access to a catalogue of best practices for learning AI skills?	○	○	○	○	○	●

Services (offered by providers)

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have easy access to coaching services?	○	○	○	○	○	●
benefit from training services?	○	○	○	○	○	●
benefit from advanced training services?	○	○	○	○	○	●
have access to support in assisting with data acquisition, data processing, and data analysis?	○	○	○	○	○	●
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	○	○	○	○	○	●
have services that helps you to assess the quality of the AI model?	○	○	○	○	○	●
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	○	○	○	○	○	●
benefit from ethical services to address the trustworthiness of AI applications?	○	○	○	○	○	●

Funding programs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have acccess to a map of funding sources?	○	○	○	○	○	●
be informed of project proposals?	○	○	○	○	○	●
be informed of AI challenges?	○	○	○	○	○	●
be informed of current and future public funding or cascade funding opportunities?	○	○	○	○	○	●

Jobs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
be informed of open job offers in the field of AI?	○	○	○	○	○	●
post job offers in the field of AI?	○	○	○	○	○	●

Events

How important would it be for you to be informed of :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
research events in the field of AI?	○	○	○	○	○	●
professional fairs in the field of AI?	○	○	○	○	○	●
EC-organized events in the field of AI?	○	○	○	○	○	●
related initiatives launched in the field of AI?	○	○	○	○	○	●
regulation updates in the field of AI?	○	○	○	○	○	●

Technical tools

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
search contents through a search engine (by categories, authors, filters...)?	○	○	○	○	○	●

Technical tools

Do you develop and train AI models?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Do you use AI for inference and application?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to AI libraries (to help you develop AI models)?

Yes | No | No answer

Technical tools

Would you like to have access to data cleaning tools?

Yes | No | No answer

Technical tools

Would you like to have access to AI bricks ready-to-use / packaged models?

Yes | No | No answer

Technical tools

Where would you like to have access to AI infrastructures for test?

Check all that apply

- [ ] Dedicated centers
- [ ] DIHs
- [ ] TEFs
- [ ] None

Technical tools

Would you like to have access to tools to help you comply with AI regulation (AI Act)?

Yes | No | No answer

Technical tools

Would you like to have access to regulatory sandboxes (allows the testing of AI models that are not fully compliant with the existing regulatory framework)?

Yes | No | No answer

Technical tools

What types of AI algorithm do you use?

Check all that apply

- [ ] Linear regression
- [ ] Logistic regression
- [ ] Decision Trees
- [ ] Naïve Bayes
- [ ] Support Vector Machines
- [ ] Random Forest
- [ ] Bagging
- [ ] Boosting
- [ ] Gradient Boosting
- [ ] Arima
- [ ] Clustering
- [ ] K-nearest Neighbors
- [ ] K-means
- [ ] Neural Networks
- [ ] Convolutional Neural Networks
- [ ] Deep Neural Networks
- [ ] Recurrent Neural Networks
- [ ] Transformers
- [ ] GAN (Generative Adversarial Networks)
- [ ] Reinforcement learning
- [ ] Natural Language Processing
- [ ] Image Processing
- [ ] Speech Processing
- [ ] Audio Processing
- [ ] Recommender systems
- [ ] Knowledge-Graphs
- [ ] Logical rules
- [ ] Agent-based
- [ ] Optimization
- [ ] Other:

Tehnical tools

What types of large pre-trained models do you use?

Check all that apply

- [ ] Image (eg YOLO...)
- [ ] Text (eg GPT, BERT...)
- [ ] Speech
- [ ] Audio
- [ ] None
- [ ] Other:

Technical tools

How do you deliver your AI apps, products, services for execution/production?

Check all that apply

- [ ] Executable (.exe)
- [ ] Jupyter Notebook
- [ ] Docker Container
- [ ] ONNX
- [ ] Library
- [ ] Open Source
- [ ] Embedded in a Saas offer (eg. 'enduser' UX in more complex application)
- [ ] Saas for AI service (eg. GPTx)
- [ ] Paas embedding AI components (eg. 'developer oriented platform' to develop AI powered application)
- [ ] Other:

Technical tools

Do your AI apps, products, services require one or multiple GPUs?

Check all that apply

- [ ] Yes, for training
- [ ] Yes, for inference/application
- [ ] No

Tehnical tools

What technology is used for the public interface of your AI apps, products, services (as used by a customer/user)?

Check all that apply

- [ ] Graphical User Interface
- [ ] RESTful interface (e.g. HTTP and JSON or XML)
- [ ] ROS
- [ ] GRPC/Protobuf
- [ ] Specific client library
- [ ] Files (Batch processing)
- [ ] Other:

Technical tools

Do you use MLOps tools?

Check all that apply

- [ ] Kubeflow
- [ ] Airflow
- [ ] AutoML
- [ ] Pachyderm
- [ ] DVC
- [ ] Other:

Technical tools

Do you use AI-Services in the Cloud?

Check all that apply

- [ ] Amazon Sagemaker
- [ ] Microsost Azure
- [ ] OpenAI
- [ ] Huggingface
- [ ] OVH
- [ ] Other:

Techincal tools

Do you own any IT System / platform able to expose data and / or functionalities (e.g. via APIs)?

Yes	No	No answer

Technical tools

Could you briefly summarise from a technical point of view how data and functionalities are / could be exposed? (e.g. REST APIs, etc.)?

Technical tools

Do you see any potential benefits from the integration of your IT System with the AI Platform? Could you briefly describe your expected benefits?

Technical tools

Which are the main problems connected with the execution of your analysis (AI/ML training)?

Check all that apply

- [ ] Lack of data
- [ ] Lack of resources
- [ ] Resource instability
- [ ] Lack of competences
- [ ] Not detected any specific problems yet
- [ ] Other:

Technical tools

At which stage of the development of your analysis (AI/ML training) are you at now?

Check all that apply

- [ ] Data collection
- [ ] Data labelling
- [ ] Code development
- [ ] Framework evaluation
- [ ] Testing/Benchmarking
- [ ] Production
- [ ] Not started yet

Technical tools

At which stage of the development of your analysis are you at now?

Check all that apply

- [ ] Business understanding - What does the business need ?
- [ ] Data understanding - What data do we have / need? Is it clean?
- [ ] Data preparation - How do we organize the data for modeling?
- [ ] Modeling - What modeling techniques should we apply?
- [ ] Evaluation - Which model best meets the business objectives?
- [ ] Deployment - How do stakeholders access the results?
- [ ] Other:

Previous Next

10.6.5.4 Public bodies – AI unaware version

You are AI ready

Which means that you are certainly able to :
- develop customized AI solutions for specific business needs
- develop a roadmap for AI implementation
- develop customized AI model for unique business needs

Contacts

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

Definition of TEF
Testing and Experimentation Facility (TEF) is a technology infrastructure that has specific expertise and experience of testing mature technology in a given sector, under real or close to real conditions

Definition of DIH
Digital Innovation Hubs (DIHs) can help ensure that every company, small or large, high-tech or not, can take advantage of digital opportunities. DIHs are one-stop shops that help companies become more competitive with regard to their business/production processes, products or services using digital technologies. DIHs provide access to technical expertise and experimentation, so that companies can "test before invest". They also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation.

	1	2	3	4	5	No answer
have access to AI solutions providers fitted to your needs, by category?	○	○	○	○	○	●
have access to VCs (Venture Capitalists)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
be introduced to (or interact with) like-minded companies?	○	○	○	○	○	●
be introduced to (or interact with) researchers fitted to your needs?	○	○	○	○	○	●
participate in the AI community through forums (for sharing results, tools and solutions from the broader European AI community)?	○	○	○	○	○	●
have access to a TEF (Testing and Experimentation Facility)?	○	○	○	○	○	●
have access to a DIH (Digital Innovation Hub)?	○	○	○	○	○	●

Content

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to success stories on AI projects?	○	○	○	○	○	●
have access to best practices and guidelines documents?	○	○	○	○	○	●
have access to a selection of articles on AI in the press?	○	○	○	○	○	●
have access to a selection of papers on AI applications?	○	○	○	○	○	●
have access to a selection of academic research papers?	○	○	○	○	○	●

Training

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have autonomous access to basic training modules on AI?	○	○	○	○	○	●
have autonomous access to basic training modules on applications of AI to your domain?	○	○	○	○	○	●
have autonomous access to advanced training modules on AI?	○	○	○	○	○	●
have autonomous access to training on Trustworthy AI, including AI regulation?	○	○	○	○	○	●
have autonomous access to a catalogue of best practices for learning AI skills?	○	○	○	○	○	●

Services (offered by providers)

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have easy access to coaching services?	○	○	○	○	○	●
benefit from training services?	○	○	○	○	○	●
benefit from advanced training services?	○	○	○	○	○	●
have access to support in assisting with data acquisition, data processing, and data analysis?	○	○	○	○	○	●
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	○	○	○	○	○	●
have services that helps you to assess the quality of the AI model?	○	○	○	○	○	●
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	○	○	○	○	○	●
benefit from ethical services to address the trustworthiness of AI applications?	○	○	○	○	○	●

Funding programs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have acccess to a map of funding sources?	○	○	○	○	○	●
be informed of project proposals?	○	○	○	○	○	●
be informed of AI challenges?	○	○	○	○	○	●
be informed of current and future public funding or cascade funding opportunities?	○	○	○	○	○	●

Jobs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
be informed of open job offers in the field of AI?	○	○	○	○	○	●
post job offers in the field of AI?	○	○	○	○	○	●

Events

How important would it be for you to be informed of :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
research events in the field of AI?	○	○	○	○	○	●
professional fairs in the field of AI?	○	○	○	○	○	●
EC-organized events in the field of AI?	○	○	○	○	○	●
related initiatives launched in the field of AI?	○	○	○	○	○	●
regulation updates in the field of AI?	○	○	○	○	○	●

Previous Next

10.6.5.5 TEFs & DIHs – AI aware version

You are AI ready

Which means that you are certainly able to :
- develop customized AI solutions for specific business needs
- develop a roadmap for AI implementation
- develop customized AI model for unique business needs

Contacts

Definition of TEF
Testing and Experimentation Facility (TEF) is a technology infrastructure that has specific expertise and experience of testing mature technology in a given sector, under real or close to real conditions

Definition of DIH
Digital Innovation Hubs (DIHs) can help ensure that every company, small or large, high-tech or not, can take advantage of digital opportunities. DIHs are one-stop shops that help companies become more competitive with regard to their business/production processes, products or services using digital technologies. DIHs provide access to technical expertise and experimentation, so that companies can "test before invest". They also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation.

Remember that the purpose of this questionnaire is to create an overview of the AI needs of TEFs and DIHs in order to prepare the new version of the AI-On Demand platform.

How important would it be for you that the platform allows you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to AI solutions providers fitted to your needs, by category?	○	○	○	○	○	●
have access to VCs (Venture Capitalists)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
be introduced to (or interact with) like-minded companies?	○	○	○	○	○	●
be introduced to (or interact with) researchers fitted to your needs?	○	○	○	○	○	●
participate in the AI community through forums (for sharing results, tools and solutions from the broader European AI community)?	○	○	○	○	○	●
have access to a TEF (Testing and Experimentation Facility)?	○	○	○	○	○	●
have access to a DIH (Digital Innovation Hub)?	○	○	○	○	○	●
find suitable AI experts to provide solutions (through a search engine)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
have access to a networking space to find funding and sponsors?	○	○	○	○	○	●
have access to a networking space with DIHs/Regional authorities or TEFs?	○	○	○	○	○	●
have access to an ecosystem of researchers, industry, AI experts...?	○	○	○	○	○	●

Content

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to success stories on AI projects?	○	○	○	○	○	●
have access to best practices and guidelines documents (user journeys, innovation practices...)?	○	○	○	○	○	●
have access to a selection of articles on AI in the press?	○	○	○	○	○	●
have access to a selection of papers on AI applications?	○	○	○	○	○	●
have access to a selection of academic research papers?	○	○	○	○	○	●
have access to AI prototypes?	○	○	○	○	○	●
have access to feasibility frameworks?	○	○	○	○	○	●
have access to cost examples?	○	○	○	○	○	●
have access to quality assurance methodologies?	○	○	○	○	○	●

Data

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

Definition of data space
A data space is a decentralised infrastructure for trustworthy data sharing and exchange in data ecosystems, based on commonly agreed principles. It is thus a type of data relationship between trusted partners who adhere to the same high standards and guidelines when it comes to data storage and sharing

	1	2	3	4	5	No answer
have access to existing datasets?	○	○	○	○	○	●
know about existing data spaces in your domain?	○	○	○	○	○	●
know about existing initiatives for data sharing?	○	○	○	○	○	●
have methods to assess your data quality?	○	○	○	○	○	●

Training

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have autonomous access to basic training modules on AI?	○	○	○	○	○	●
have autonomous access to basic training modules on applications of AI to your domain?	○	○	○	○	○	●
have autonomous access to advanced training modules on AI?	○	○	○	○	○	●
have autonomous access to training on Trustworthy AI, including AI regulation?	○	○	○	○	○	●
have autonomous access to a catalogue of best practices for learning AI skills?	○	○	○	○	○	●

Services (offered by providers)

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have easy access to coaching / consulting services?	○	○	○	○	○	●
benefit from training services?	○	○	○	○	○	●
benefit from advanced training services?	○	○	○	○	○	●
have access to support in assisting with data acquisition, data processing, and data analysis?	○	○	○	○	○	●
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	○	○	○	○	○	●
have services that helps you to assess the quality of the AI model?	○	○	○	○	○	●
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	○	○	○	○	○	●
benefit from ethical services to address the trustworthiness of AI applications?	○	○	○	○	○	●
receive assistance with GDPR (General Data Protection Regulation)?	○	○	○	○	○	●
receive assistance with AI Act?	○	○	○	○	○	●
receive assistance with Test-before-invest (strongly related to DIHs/EDIHs)?	○	○	○	○	○	●
receive assistance with Test at scale (strongly related to TEFs)?	○	○	○	○	○	●

Funding programs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have acccess to a map of funding sources?	○	○	○	○	○	●
be informed of project proposals?	○	○	○	○	○	●
be informed of AI challenges?	○	○	○	○	○	●
be informed of current and future public funding or cascade funding opportunities?	○	○	○	○	○	●

Jobs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
be informed of open job offers in the field of AI?	○	○	○	○	○	●
post job offers in the field of AI?	○	○	○	○	○	●

Events

How important would it be for you to be informed of :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
research events in the field of AI?	○	○	○	○	○	●
professional fairs in the field of AI?	○	○	○	○	○	●
EC-organized events in the field of AI?	○	○	○	○	○	●
related initiatives launched in the field of AI?	○	○	○	○	○	●
regulation updates in the field of AI?	○	○	○	○	○	●

Technical tools

Would you like to have access to tools that could aid DIH / TEF customers with AI solution development?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to tools that could aid DIH / TEF customers with technical challenges?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to tools that could aid DIH / TEF customers with testing and validation?

✔ Yes | ⊘ No | ○ No answer

Technical tools

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
search contents through a search engine (by categories, authors, filters...)?	○	○	○	○	○	●

Technical tools

Do you develop and train AI models?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Do you use AI for inference and application?

✔ Yes | ⊘ No | ○ No answer

Technical tools

Would you like to have access to AI libraries (to help you develop AI models)?

Yes | No | No answer

Technical tools

Would you like to have access to data cleaning tools?

Yes | No | No answer

Technical tools

Would you like to have access to AI bricks ready-to-use / packaged models?

Yes | No | No answer

Technical tools

Where would you like to have access to AI infrastructures for test?

Check all that apply

- [ ] Dedicated centers
- [ ] DIHs
- [ ] TEFs
- [ ] None

Technical tools

Would you like to have access to tools to help you comply with AI regulation (AI Act)?

Yes | No | No answer

Technical tools

Would you like to have access to regulatory sandboxes (allows the testing of AI models that are not fully compliant with the existing regulatory framework)?

Yes | No | No answer

Technical tools

What types of AI algorithm do you use?

Check all that apply

- [ ] Linear regression
- [ ] Logistic regression
- [ ] Decision Trees
- [ ] Naïve Bayes
- [ ] Support Vector Machines
- [ ] Random Forest
- [ ] Bagging
- [ ] Boosting
- [ ] Gradient Boosting
- [ ] Arima
- [ ] Clustering
- [ ] K-nearest Neighbors
- [ ] K-means
- [ ] Neural Networks
- [ ] Convolutional Neural Networks
- [ ] Deep Neural Networks
- [ ] Recurrent Neural Networks
- [ ] Transformers
- [ ] GAN (Generative Adversarial Networks)
- [ ] Reinforcement learning
- [ ] Natural Language Processing
- [ ] Image Processing
- [ ] Speech Processing
- [ ] Audio Processing
- [ ] Recommender systems
- [ ] Knowledge-Graphs
- [ ] Logical rules
- [ ] Agent-based
- [ ] Optimization
- [ ] Other:

Tehnical tools

What types of large pre-trained models do you use?

Check all that apply

- [ ] Image (eg YOLO...)
- [ ] Text (eg GPT, BERT...)
- [ ] Speech
- [ ] Audio
- [ ] None
- [ ] Other:

Technical tools

How do you deliver your AI apps, products, services for execution/production?

Check all that apply

- [ ] Executable (.exe)
- [ ] Jupyter Notebook
- [ ] Docker Container
- [ ] ONNX
- [ ] Library
- [ ] Open Source
- [ ] Embedded in a Saas offer (eg. 'enduser' UX in more complex application)
- [ ] Saas for AI service (eg. GPTx)
- [ ] Paas embedding AI components (eg. 'developer oriented platform' to develop AI powered application)
- [ ] Other:

Technical tools

Do your AI apps, products, services require one or multiple GPUs?

Check all that apply

- [ ] Yes, for training
- [ ] Yes, for inference/application
- [ ] No

Tehnical tools

What technology is used for the public interface of your AI apps, products, services (as used by a customer/user)?

Check all that apply

- [ ] Graphical User Interface
- [ ] RESTful interface (e.g. HTTP and JSON or XML)
- [ ] ROS
- [ ] GRPC/Protobuf
- [ ] Specific client library
- [ ] Files (Batch processing)
- [ ] Other:

Technical tools

Do you use MLOps tools?

Check all that apply

- [ ] Kubeflow
- [ ] Airflow
- [ ] AutoML
- [ ] Pachyderm
- [ ] DVC
- [ ] Other:

Technical tools

Do you use AI-Services in the Cloud?

Check all that apply

- [ ] Amazon Sagemaker
- [ ] Microsost Azure
- [ ] OpenAI
- [ ] Huggingface
- [ ] OVH
- [ ] Other:

Techincal tools

Do you own any IT System / platform able to expose data and / or functionalities (e.g. via APIs)?

Yes	No	No answer

Technical tools

Could you briefly summarise from a technical point of view how data and functionalities are / could be exposed? (e.g. REST APIs, etc.)?

Technical tools

Do you see any potential benefits from the integration of your IT System with the AI Platform? Could you briefly describe your expected benefits?

Technical tools

Which are the main problems connected with the execution of your analysis (AI/ML training)?

Check all that apply

- [ ] Lack of data
- [ ] Lack of resources
- [ ] Resource instability
- [ ] Lack of competences
- [ ] Not detected any specific problems yet
- [ ] Other:

Technical tools

At which stage of the development of your analysis (AI/ML training) are you at now?

Check all that apply

- [ ] Data collection
- [ ] Data labelling
- [ ] Code development
- [ ] Framework evaluation
- [ ] Testing/Benchmarking
- [ ] Production
- [ ] Not started yet

Technical tools

At which stage of the development of your analysis are you at now?

Check all that apply

- [ ] Business understanding - What does the business need ?
- [ ] Data understanding - What data do we have / need? Is it clean?
- [ ] Data preparation - How do we organize the data for modeling?
- [ ] Modeling - What modeling techniques should we apply?
- [ ] Evaluation - Which model best meets the business objectives?
- [ ] Deployment - How do stakeholders access the results?
- [ ] Other:

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10.6.5.6 TEFs & DIHs – AI unaware version

You are AI ready

Which means that you are certainly able to :
- develop customized AI solutions for specific business needs
- develop a roadmap for AI implementation
- develop customized AI model for unique business needs

Contacts

Definition of TEF
Testing and Experimentation Facility (TEF) is a technology infrastructure that has specific expertise and experience of testing mature technology in a given sector, under real or close to real conditions

Definition of DIH
Digital Innovation Hubs (DIHs) can help ensure that every company, small or large, high-tech or not, can take advantage of digital opportunities. DIHs are one-stop shops that help companies become more competitive with regard to their business/production processes, products or services using digital technologies. DIHs provide access to technical expertise and experimentation, so that companies can "test before invest". They also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation.

Remember that the purpose of this questionnaire is to create an overview of the AI needs of TEFs and DIHs in order to prepare the new version of the AI-On Demand platform.

How important would it be for you that the platform allows you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to AI solutions providers fitted to your needs, by category?	○	○	○	○	○	●
have access to VCs (Venture Capitalists)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
be introduced to (or interact with) like-minded companies?	○	○	○	○	○	●
be introduced to (or interact with) researchers fitted to your needs?	○	○	○	○	○	●
participate in the AI community through forums (for sharing results, tools and solutions from the broader European AI community)?	○	○	○	○	○	●
have access to a TEF (Testing and Experimentation Facility)?	○	○	○	○	○	●
have access to a DIH (Digital Innovation Hub)?	○	○	○	○	○	●
find suitable AI experts to provide solutions (through a search engine)?	○	○	○	○	○	●
be introduced to AI solutions providers?	○	○	○	○	○	●
have access to a networking space to find funding and sponsors?	○	○	○	○	○	●
have access to a networking space with DIHs/Regional authorities or TEFs?	○	○	○	○	○	●
have access to an ecosystem of researchers, industry, AI experts...?	○	○	○	○	○	●

Content

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have access to success stories on AI projects?	○	○	○	○	○	●
have access to best practices and guidelines documents (user journeys, innovation practices...)?	○	○	○	○	○	●
have access to a selection of articles on AI in the press?	○	○	○	○	○	●
have access to a selection of papers on AI applications?	○	○	○	○	○	●
have access to a selection of academic research papers?	○	○	○	○	○	●
have access to AI prototypes?	○	○	○	○	○	●
have access to feasibility frameworks?	○	○	○	○	○	●
have access to cost examples?	○	○	○	○	○	●
have access to quality assurance methodologies?	○	○	○	○	○	●

Training

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have autonomous access to basic training modules on AI?	○	○	○	○	○	●
have autonomous access to basic training modules on applications of AI to your domain?	○	○	○	○	○	●
have autonomous access to advanced training modules on AI?	○	○	○	○	○	●
have autonomous access to training on Trustworthy AI, including AI regulation?	○	○	○	○	○	●
have autonomous access to a catalogue of best practices for learning AI skills?	○	○	○	○	○	●

Services (offered by providers)

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have easy access to coaching / consulting services?	○	○	○	○	○	●
benefit from training services?	○	○	○	○	○	●
benefit from advanced training services?	○	○	○	○	○	●
have access to support in assisting with data acquisition, data processing, and data analysis?	○	○	○	○	○	●
have access to guidelines or checklist to assess and document the trustworthiness of your AI solution?	○	○	○	○	○	●
have services that helps you to assess the quality of the AI model?	○	○	○	○	○	●
benefit from legal services to address the trustworthiness of AI applications, including AI regulation (AI Act)?	○	○	○	○	○	●
benefit from ethical services to address the trustworthiness of AI applications?	○	○	○	○	○	●
receive assistance with GDPR (General Data Protection Regulation)?	○	○	○	○	○	●
receive assistance with AI Act?	○	○	○	○	○	●
receive assistance with Test-before-invest (strongly related to DIHs/EDIHs)?	○	○	○	○	○	●
receive assistance with Test at scale (strongly related to TEFs)?	○	○	○	○	○	●

Funding programs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
have acccess to a map of funding sources?	○	○	○	○	○	●
be informed of project proposals?	○	○	○	○	○	●
be informed of AI challenges?	○	○	○	○	○	●
be informed of current and future public funding or cascade funding opportunities?	○	○	○	○	○	●

Jobs

How important would it be for you to :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
be informed of open job offers in the field of AI?	○	○	○	○	○	●
post job offers in the field of AI?	○	○	○	○	○	●

Events

How important would it be for you to be informed of :

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
research events in the field of AI?	○	○	○	○	○	●
professional fairs in the field of AI?	○	○	○	○	○	●
EC-organized events in the field of AI?	○	○	○	○	○	●
related initiatives launched in the field of AI?	○	○	○	○	○	●
regulation updates in the field of AI?	○	○	○	○	○	●

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10.6.5.7 Infrastructure questions – (common to all versions when displayed)

Infrastructure

Do you provide access to:

Check all that apply

- ☐ Edge data center infrastructure
- ☐ Cloud data center infrastructure
- ☐ HPC data center infrastructure
- ☐ None of the above

Edge

Edge computing is computing that takes place at or near the physical location of either the user or the source of the data. For instance, a 5G Edge datacenter can host AI/ML based cloud native applications (using AI/ML inference) and give users network latency below 10 ms and also quality of service guarantees along other axes (e.g., bandwidth, security, availability, etc.). Important factors determining if Edge could be useful are needs related to the topics below. Please indicate on a scale from 1 to 5 how important they are for you.

(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
Security and privacy	○	○	○	○	○	●
Real-time interaction/data processing (latency below 10ms)	○	○	○	○	○	●
Access to data from many sensors (IoT)	○	○	○	○	○	●
Mobility of the user (i.e., connect to cellular networks)	○	○	○	○	○	●
Bandwidth (above 100 Mbits/s)	○	○	○	○	○	●
Network quality (e.g., Service Level Agreements)	○	○	○	○	○	●

Are you using Edge infrastructure for AI/ML purposes, or consider using it in the future?

Choose one of the following answers

- ○ Using it
- ○ Not using it
- ○ Will use it
- ○ Not currently planning to use it
- ● No answer

HPC

High Performance Computing (HPC) refers to processing complex calculations at high speed across multiple servers in parallel. A typical HPC solution has 3 main high performance components: compute, network and storage. HPC solutions can be deployed on-premise, at the edge, or in the cloud. Important factors determining if HPC infrastructures could be useful for your AI/ML training or inference are listed below. Please click check-boxes to indicate what applies for you. Please indicate on a scale from 1 to 5 how important they are for you. (1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
High computational capabilities to perform massive amounts of calculations	○	○	○	○	○	●
High performance bandwidth and memory capacity to process large volumes of data	○	○	○	○	○	●

Have you used HPC, and on which platform ? (click all the relevant checkboxes)

Check all that apply

- [ ] On-premise
- [ ] Public Cloud
- [ ] National Centres
- [ ] Other
- [ ] Not used
- [ ] Not used, but planning to use it

What is your perceived barrier to the use of HPC? (1 : not a barrier | 5 : extreme barrier)

	1	2	3	4	5	No answer
The order of magnitude of my analysis does not require the use of HPC	○	○	○	○	○	●
Not aware of the existence of such solutions	○	○	○	○	○	●
Fear of processing sensitive data with external parties	○	○	○	○	○	●
Financial barriers	○	○	○	○	○	●
Lack of technology partners and/or skills	○	○	○	○	○	●

Cloud

Cloud Computing is the act of running workloads within clouds—which are IT environments that abstract, pool, and share scalable resources across a network. It provides infrastructures, services, platforms and applications on demand across networks. Important factors determining if Cloud infrastructure could be useful for your AI/ML training or inference are listed below. Please indicate on a scale from 1 to 5 how important they are for you.
(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
Pay-per-use cost model	○	○	○	○	○	●
Infrastructure on-demand	○	○	○	○	○	●
Platform on-demand	○	○	○	○	○	●
Software on-demand	○	○	○	○	○	●
Data location	○	○	○	○	○	●
Availability	○	○	○	○	○	●
Scalability	○	○	○	○	○	●
Security	○	○	○	○	○	●

Have you used Cloud infrastructure, and on which platform ?

Check all that apply

- [ ] On-premise/Private Cloud
- [ ] Public cloud
- [ ] Hybrid Cloud
- [ ] MultiCloud
- [ ] Not used
- [ ] Not used, but planning to use it

What is your perceived importance for AI/ML training of ?
(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
Edge infrastructure	○	○	○	○	○	●
Cloud infrastructure	○	○	○	○	○	●
HPC infrastructure	○	○	○	○	○	●

What is your perceived importance for AI/ML inference of ?
(1 : not important at all | 5 : extremely important)

	1	2	3	4	5	No answer
Edge infrastructure	○	○	○	○	○	●
Cloud infrastructure	○	○	○	○	○	●
HPC infrastructure	○	○	○	○	○	●

How do you judge AI/ML infrastructure cost/value ratio for
(1 : very low | 5 : very high)

	1	2	3	4	5	No answer
Edge infrastructure	○	○	○	○	○	●
Cloud infrastructure	○	○	○	○	○	●
HPC infrastructure	○	○	○	○	○	●

AI/ML potentially requires a lot of data, and may take a lot of time.
How long does your analysis (AI/ML) take :

Check all that apply

- ☐ Minutes
- ☐ Hours
- ☐ Days
- ☐ Weeks
- ☐ Months
- ☐ Not doing any training
- ☐ Not doing any inference

How much data do you analyse (for AI/ML) ?

Check all that apply

- ☐ Kilobytes
- ☐ Megabytes
- ☐ Gigabytes
- ☐ Terabytes
- ☐ Petabytes
- ☐ Not doing any training
- ☐ Not doing any inference

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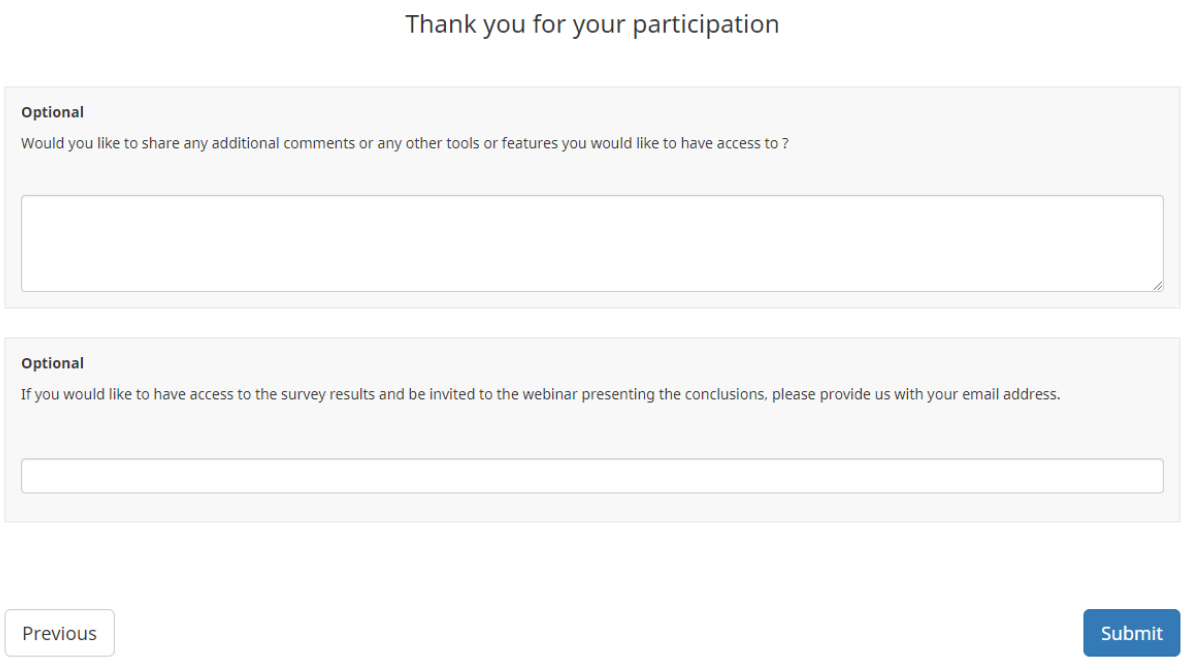
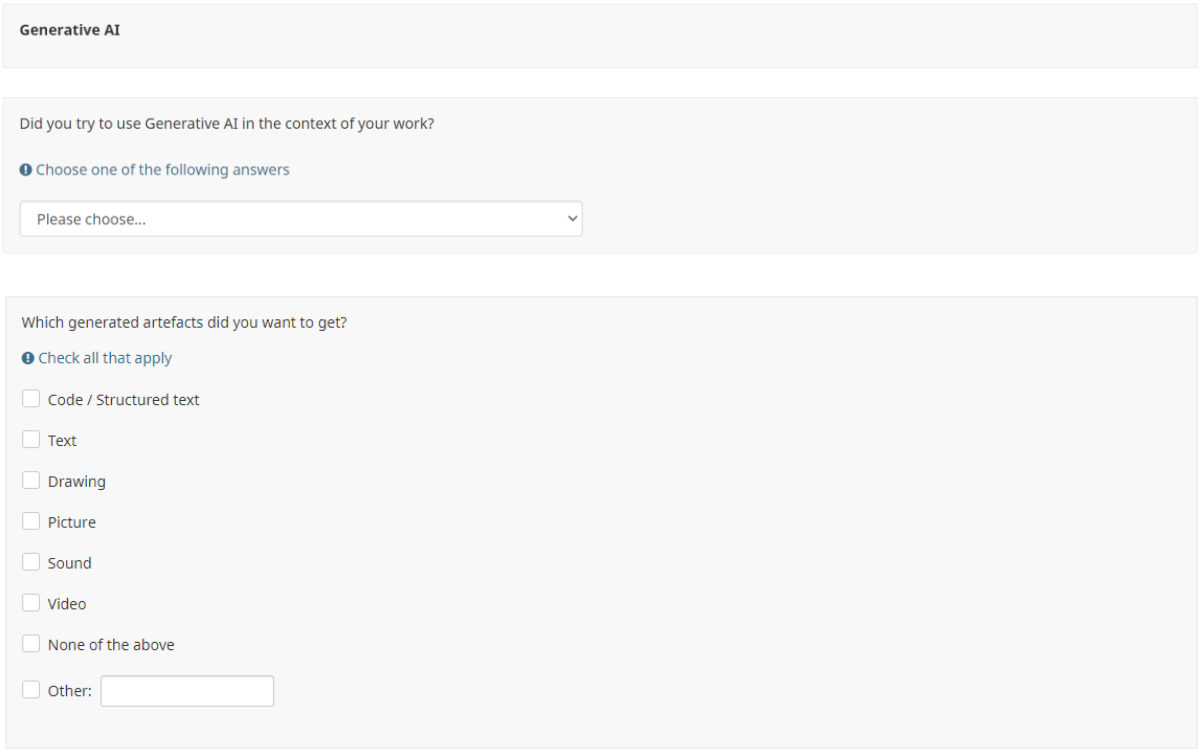
10.6.6 End page

Note: this page is identical for the 3 versions SME and large industries, public bodies and TEFs and DIHs.



10.6.7 Generative AI questions

These questions are only included in the open format questionnaires of SMEs & large Industries and public bodies.



What type of tasks do you use generative AI for?

Check all that apply

- [ ] Generate new content, such as press articles, a newsletter or even books
- [ ] Complete partially written sentences, paragraphs, or code
- [ ] Hybridize the search experience by offering a chat experience to consumers in addition to the search engine results
- [ ] Classify the text into different categories
- [ ] Analyze opinions in a text. e.g. to determine whether they are positive, negative or neutral
- [ ] Translate text from one language to another
- [ ] Convert text to speech or speech to text
- [ ] Summarize long texts, to speed up comprehension
- [ ] Other:

What is the expected outcome?

Check all that apply

- [ ] Time saving
- [ ] Added value, e.g. generating new ideas / content, reaching new markets
- [ ] Other:

How do you rate the result for your experiment?

Choose one of the following answers

Please choose...

What are you willing to use generative AI for?

Check all that apply

- [ ] Internal use-cases
- [ ] External/customer-facing ones
- [ ] Both
- [ ] None of the above
- [ ] Other:

How was the AI component integrated into your solutions?

Check all that apply

- [ ] Web service
- [ ] Ad-hoc software module
- [ ] Other:

What type of solution do you favor?

Choose one of the following answers

Please choose...

Which system(s) did you try?

Check all that apply

- [ ] ChatGPT (OpenAI)
- [ ] GPT-4 (OpenAI)
- [ ] BARD (Google)
- [ ] PaLM (Google)
- [ ] LaMDA (Google)
- [ ] BERT (Google)
- [ ] LLaMA (Meta AI)
- [ ] Cohere Generate (Cohere)
- [ ] Claude (Anthropic)
- [ ] Bloom (Hugging Face)
- [ ] AlphaCode
- [ ] GitHub Copilot
- [ ] CodeGPT
- [ ] Synthesia
- [ ] DALL-E
- [ ] Craiyon
- [ ] Stable Diffusion
- [ ] Midjourney
- [ ] Whisper
- [ ] Murf.ai
- [ ] Other:

Do you use?

Check all that apply

- [ ] Out-of-the-box solutions
- [ ] Fine-tuned models
- [ ] Both
- [ ] Other:

What are the risks you identified in using generative AI?

Check all that apply

- [ ] Confidentiality concerns (disclosure of company data)
- [ ] GDPR concerns (usage of personally identifiable information in the training dataset)
- [ ] Intellectual Property of results
- [ ] Potential Plagiarisms (Copyright infringements)
- [ ] Regulatory uncertainty
- [ ] Sovereignty concerns
- [ ] Ethical considerations (content inaccuracy or harmful)
- [ ] Needs to hire / train people with specific domain skills
- [ ] Needs to train current employees on generative AI
- [ ] Ecological concerns (eg. energy needs)
- [ ] Lack of data related to my own business
- [ ] Control loss over my data
- [ ] Other:

Why haven't you already integrated such solutions?

Check all that apply

- [ ] Issue of trust
- [ ] Lack of resources
- [ ] Risk of vendor lock-in
- [ ] Control loss over my data
- [ ] Uncertainty about the legal landscape and risk of fines
- [ ] Other:

Are you aware that such solutions are used for?

Check all that apply

- [ ] Generating new content, such as press articles, a newsletter or even books
- [ ] Completing partially written sentences, paragraphs, or code
- [ ] Hybridizing the search experience by offering a chat experience to consumers in addition to the search engine results
- [ ] Classifying the text into different categories
- [ ] Analyzing opinions in a text. e.g. to determine whether they are positive, negative or neutral
- [ ] Translating text from one language to another
- [ ] Converting text to speech or speech to text
- [ ] Summarizing long texts, to speed up comprehension
- [ ] None of the above