



Open Call 3 – Use Cases
Open Call Text



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1. Introduction

This document provides information regarding the AIPlan4EU framework and associated Open Call for Use Cases (also referred to as Open Call 3). All associated Annexes must be additionally considered for the submission of a use-case proposal.

The project will use the Funding Support to Third Parties (FSTP) mechanism to push the uptake of AI planning technologies through an AI on-demand platform, to widen the use-cases addressed by the project, to robust the collection of planning engines within the UPF Unified Planning Framework) and to increase the number of technologies integrated through TSBs (Technology-Specific Bridge).

With Open Call 3, the AIPlan4EU consortium aims to connect with key stakeholders from non-tech sectors that will challenge innovators towards the development of TSBs. This open call will be issued to engage 5 use-cases. The use-cases will be used to refine the UPF requirements and to enhance the training material. It means that the winner use-cases will be involved in the deployment of the use case foreseen in the subsequent phases of the projects.

The project will consider use-cases from not only the 7 application areas (Table 1), but also from diverse application areas that will drive the design and the development of a framework and include several available planning systems that can be selected to solve practical problems.

1.1 AIPlan4EU in a Brief

Automated Planning and Scheduling is a central research area in AI that has been studied since the inception of the field and where European research has been making strong contributions over decades. Planning is a decision-making technology that consists of reasoning on a predictive model of a system being controlled and deciding how and when to act in order to achieve the desired objective. It is a relevant technology for many application areas that need quick, automated, and optimal decisions, like agile manufacturing, agri-food, or logistics. Although there is a wealth of techniques that are mature in terms of science and systems, several obstacles hinder their adoption, thus preventing them from making the footprint on European industry that they should make. For example, it is hard for practitioners to find the right techniques for a given planning problem, there are no shared standards to use them, and there is no easy access to expertise on how to encode domain knowledge into a planner.

The AIPlan4EU project will bring AI planning as a first-class citizen in the European AI On-Demand (AI4EU) Platform by developing a uniform, user-centered framework to access the existing planning technology and by devising concrete guidelines for innovators and practitioners on how to use this technology. To do so, we will consider use-cases from diverse application areas that will drive the design and the development of the framework and include several available planning systems as engines that can be selected to solve practical problems. We will develop a general and planner-agnostic API that will both be served by the AI4EU platform and be available as a resource to be integrated into the users' systems. The framework will be validated on use-cases both from within the consortium and recruited by means of cascade funding; moreover, standard interfaces between the framework and common industrial technologies will be developed and made available.

AIPlan4EU consortium encompasses 16 European partners from different industries and with various expertise (research groups and companies). Within the consortium, 7 application areas (Table 1) will be considered from the beginning. These are both areas where planning has already been used as well as areas where planning has seen very little application: planning for space, agriculture, manufacturing, logistics, autonomous driving, automated experimentation, and subsea robotics). In addition to these application areas, AIPlan4EU uses part of the cascade funding to widen as much as possible the elicitation of requirements.



AIPlan4EU is centred around 6 ambitious objectives:

- O1: Making planning accessible to practitioners and innovators
- O2: Facilitate the integration of planning and other ICT technologies
- O3: Making planning relevant in diverse application sectors
- O4: Seamlessly integrate planning within the AI4EU platform
- O5: Facilitate learning of planning for reskilling and lower the access barrier
- O6: Standardize and drive academic research towards applications.

1.2 Concept

Following the overall vision for AI in Europe, the project will focus on planning technology and bringing it to innovators and practitioners. On one side, AIPlan4EU will leverage the excellent research that Europe has funded and constructed over the years. Moreover, being a model-based technology, planning is particularly suited to ensure trust and being explainable: both these factors will be guiding principles of the project and will be particularly highlighted in the different use-cases where humans are subjected or can interfere with the decisions and suggestions of planners.

Over the years, planning has been applied in several applicative domains (e.g., space, electroplating, and port operations) and has seen an impressive flourishing of techniques, tools, and theory that achieved spectacular results. Despite these successes, implementing innovative solutions based on planning is still costly and requires dedicated and specialized expertise: in many cases, practitioners need to re-implement state-of-the-art techniques and customize them for their needs. On the other hand, efficient research tools are available, but their technological usability is limited by the fact that they are engineered to solve a given planning problem expressed in a dedicated formal language instead of providing suitable APIs for practitioners to use. Another issue is fragmentation: it is very hard, even for experts, to reliably predict which technique will work well on a certain problem, and, in addition, the available research planning tools are not uniform in their API, input language, and capability.

AIPlan4EU aims at solving these problems through the AI4EU platform: we will offer state-of-the-art planning technology through a unified API designed for practitioners and validated on practical use-cases that will be a convenient entry-point for any innovator willing to take advantage of plan-generation techniques and related technologies. This goal is well aligned with the AI4EU platform vision: offer AI technologies on-demand. All the resources and the methodologies developed within the project will be offered through the AI4EU platform that will be extended to offer novices a convenient entry point for planning users.

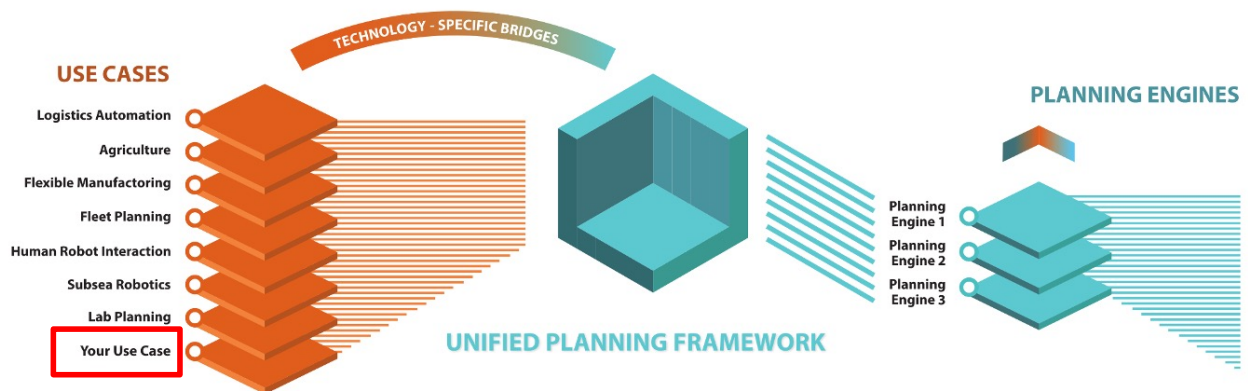


Figure 1: Overview of the AIPlan4EU vision and relationship with AI4EU platform

Figure 1 presents the overall architecture of our vision: we will collect several state-of-the-art planning engines under a unified planning API and present the resulting Unified Planning Framework (UPF for short) as a resource in the AI4EU platform. In addition to the innovative UPF framework, we will validate its applicability through several case studies in diverse application domains, and for each of them, we will develop a “Technology-Specific Bridge” (TSB for short) that will connect the ICT technology relevant in an application domain with the planning services UPF offers. As an example, consider a logistics application domain and imagine a scenario, where we want to use planning techniques to automate decision-making for intra-logistics in a warehouse where a certain Warehouse Management System (WMS) software is in use. The TSB in this context will be responsible for assessing the status of the warehouse and of the orders from the WMS software and transforming this information into a (series of) planning queries for the UPF. Moreover, the same TSB will convert the answers, measures, and estimations produced by the UPF into meaningful quantities and decisions at the level of the WMS. In this example scenario, the WMS is the relevant ICT technology for the application domain. The software will not be the sole contribution AIPlan4EU will bring into the AI4EU platform. In fact, both the collected planning use-cases and the identified ICT technologies will be documented and reported in the AI4EU platform for future reference.

1.3 Designing from Use-Cases

The design of the various activities in AIPlan4EU will be derived from user needs: the UPF needs to be usable by practitioners, therefore we want to elicit requirements for the framework directly from the final users and we planned a series of measures to keep the users involved in the design and development of the platform throughout the project. Within the consortium, we identified 7 applicative areas (Table 1) to take into consideration from the beginning: these are both areas where planning has already been used as well as areas where planning has seen very little application.



Application Areas
Planning for space
Planning for agriculture
Planning for flexible manufacturing
Planning for logistics automation
Planning for autonomous driving
Planning for automated experimentation (in FMCG – fast-moving consumer goods)
Planning for Subsea Robotics

Table 1: AIPlan4EU Application Areas

AI planning technology has been used in several projects in the industrial world, but most of these efforts have been concentrated in specific domains. With AIPlan4EU, we aim at reversing this trend and at applying planning technologies to a wide variety of industrial problems in several diverse domains.

2. Open Calls Overview

The project will use the Funding Support to Third Parties (FSTP) mechanism to push the uptake of AI planning technologies through an AI on-demand platform (AI4EU), to widen the use-cases addressed by the project, and to robust the collection of planning engines within the UPF (Unified Planning Framework). In order to connect applications to the planning technology in the UPF, we envision several technology-specific bridges (TSBs): interfaces that map the applicative data and abstractions into planning and vice versa.

AIPlan4EU organizes 2 open calls to widen the use-cases addressed by the project, to robust the collection of planning engines within the UPF, and to increase the number of technologies integrated through TSBs. We will issue two open calls.

1. **Call for Use-Cases:** a call to connect with key stakeholders from non-tech sectors that will challenge innovators towards the development of TSBs. 3 open calls will be issued to engage 15 use-cases.
2. **Call for Innovators:** this call is focused on engaging with innovators/organisations. 2 open-calls (OC) will be issued, with the following specific tracks having each track accessing different scopes.
 - **Track A (OC #1 & #2):** aims to engage innovators in the development and integration of new planners in the AIPlan4EU ecosystem.
 - **Track B (OC #1):** aims to deploy new use-cases within the AIPlan4EU framework. This call will attract small consortia of 2 entities: a use-case owner and a TSB provider (organisation).
 - **Track C (OC #1 & #2):** aims to attract organisations to develop TSBs for the use-cases selected from “Call for use-cases”. Both entities, TSB provider and use-case owner, will work together and validate the results.

The first call for use-cases was issued early in the project so that we could gather stakeholders from non-tech sectors providing use-case definitions that will be used on the first call for innovators. The figure below reports a view explaining how it will work:

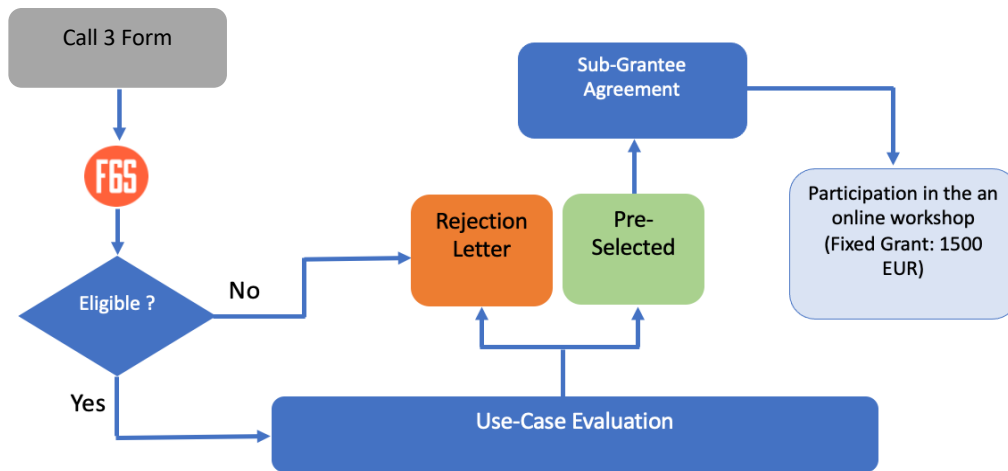


Figure 2: The overall open call process

Within the project, the funding to third parties aims to upgrade and extend AIPlan4EU technology offer beyond consortium partners and enlarge the outreach of the project deployments. For this purpose, the consortium has planned to devote a budget for the cascade funding across a total of up to:

- (i) 15 projects in total to select third-party use cases (Call for use-cases - Call 1, Call 2, Call 3);
- (ii) 32 projects that propose the deployment of the winner use-cases from the calls for use cases (Call for Innovators).

See the following funding table:

Call for Use-Cases				
Call #	Budget	#projects	#months	Total
1	€1,500	5	1	€7,500
2	€1,500	5	1	€7,500
3	€1,500	5	1	€7,500
		15	3	€22,500

Call for Innovators					
Open Call # 1 (OC#1)	Topic	Budget	#projects	#months	Total
Track A	Planners	€60,000	5	6	€300,000
Track B	UC*+TSB*	€90,000	7	6	€630,000
Track C	TSB	€60,000	2	6	€120,000
	UC*	€30,000	2	6	€60,000
			16	24	€ 1,110,000

*Use-Case
**Technology-Specific Bridges

Open Call # 2 (OC#2)					
Open Call # 2 (OC#2)	Topic	Budget	#projects	#months	Total
Track A	Planners	€60,000	4	6	€240,000
Track C	TSB	€60,000	7	6	€420,000
	UC*	€30,000	7	6	€210,000
			16	18	€ 870,000

Table 2: Open Calls Briefing



The project has published 2 open calls for use-cases in 2021 (Open Call 1 and Open Call 2).

This open call document is specifically dedicated to the third open call for use cases (Open Call 3 Use Case) and outline the application modalities for this call, highlighting that the winners' use-case will have the chance to be selected for the *call for innovators* and take part in the definition of the final requirements for the framework on par with consortium members.

This mechanism follows the principles of open innovation and is very important for the final impact of the framework: through such open calls we will involve organisations and innovators collecting the widest possible set of diverse application scenarios, technological needs, and use-cases.

Applicants are encouraged to submit use-cases that involve different contexts and scenarios that go beyond the 7 application areas (planning for space, agriculture, manufacturing, logistics, autonomous driving, automated experimentation, and subsea robotics).

3. Announcement at EC Portal

Announcement at EC Portal	
Call Title	Open Call 3 for Use-Cases
Full name of the EU Funded Project	Bringing AI Planning to the European AI On-Demand Platform
Project acronym	AIPlan4EU
Grant agreement number	101016442
Call publication date	9 th Jun 2022 at 12 PM
Call deadline	1 st Sep 2022 at 5 PM
Expected duration of participation	1 -7* months
Total EU funding available	€7,500
Task description	<p>This task aims at the definition, launch, management, evaluation and monitoring of the open calls, offering that every participant receives the best possible guidance from the assets within the consortium.</p> <p>*The selected use-case owners will participate in other initiatives (WP tasks) like a workshop that aims to engage them in the project objectives & activities and guide through the process of detailing their use-case to be published on the further project open calls and implemented during the deployment phase.</p>
Submission & evaluation process:	Submission and evaluation criteria are available in the Guide for Applicants (Available at https://www.aiplan4eu-project.eu/wp-content/uploads/2022/06/AIPlan4EU_OC3_UC_GuideforApplicants.pdf). Submit your proposal here: https://www.aiplan4eu-project.eu/call-for-use-cases/open-call-3-for-use-cases/

Table 3: Announcement Information



4. Support to Applicants & Kit for Application

4.1 Support to Applicant

The AIPlan4EU consortium will provide information to the applicants only via email (aiplan4eu_support@fbk.eu). No binding information will be provided via any other means (e.g. telephone or other email).

- **More info at:** <https://www.aiplan4eu-project.eu/call-for-use-cases/open-call-3-for-use-cases/>
- **Apply via:** <https://www.f6s.com/aiplan4eu-oc3-use-case>
- **Support team:** aiplan4eu_support@fbk.eu

4.2 Kit for Application

The AIPlan4EU Open Call 3 supported material is the following:

- The AIPlan4EU Open Call Text

The present document.

- The AIPlan4EU Guide for Applicants

This document provides in detail the information to help apply to the AIPlan4EU Open Call 1 Use-Cases such as an abstract of the AIPlan4EU action, a description of the open-call, the modalities for application, the evaluation process, the scheme of the funding support, and how to prepare and submit a use-case proposal.

It is available at: https://www.aiplan4eu-project.eu/wp-content/uploads/2022/06/AIPlan4EU_OC3_UC_GuideforApplicants.pdf

- The AIPlan4EU Application Material
 - The Use-Case template

The document is available at: https://www.aiplan4eu-project.eu/wp-content/uploads/2022/06/AIPlan4EU_OC3_UC_Use-Case-Template.pdf