

D5.5a Use Case API integration for external users

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Summary

This document aims at specifying how to manage external users of iSee tools. By external users, we mean any company who wants to use iSee cockpit to define their use case, get advice on explanation strategies (in a Behaviour Tree format) and get evaluation questions associated with the goal of their use case. We define an iSee utilisation agreement document in which the utilisation rules of iSee tools are detailed. The company who wants to use iSee, will have to accept this agreement document. By which agreement, the company accepts to share/upload the company use case; in return we (iSee team) offer them to consume our explainer catalogue and case base. To achieve this, a first version of an external API integration work is specified in this document.

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API need for external company using iSee

It is anticipated that terms of Use -described in D5.4b- include the details of contractual obligation that users have to agree when using iSee (as a product). The contractual agreements will include what local users expect from iSee platform and reversely what local users are expected to provision to iSee platform, either by an upload or messaging medium (iSee portal) or by using the UseCase integration API as a service. [This document describes the latter integration API which will support the usage of iSee main components as a service.](#) In both cases the future users are expected to register by sending an email to hello@isee4xai.com . Following this initial step, the company will be contacted by iSee.

As stated in D5.ab, Responsibilities of iSee include the provision of necessary components for evaluation , i.e. the 3 following assets:

- **the explanation strategy as an executable behaviour tree** (digital object executable with iSee engine),
- **the iSee chatbot for explanation interaction and delivery** (dialog manager software piece)
- **the analytics dashboard to review evaluation results** (software piece composed of metrics calculation engine and visualisation portal).

Further details of these components are in D3.3, D3.4 and D4.2, D4.4.

These components are primarily accessible from the hosted platform provided by iSee. However in case of external companies wishing to integrate with iSee without using the software pieces, then iSee is responsible for exposing an integration API (described in this document) specifying what these users (called “local IT users”) can expect from iSee as-a-service and what iSee expects from local users according to the terms of use and contractual agreement which as drafted in section 3 of D5.4b document.

Aligned with the principles of using co-creation approach to increase and socialise the knowledge about Explanation experience reuse across sectors, the project team is building Use Case integration API and advocate the local users to use it when they prefer using a locally installed version of the iSee Cockpit or another local tool compatible with iSee API. The present document aims at drafting the obligations of iSee and these so-called local users, in terms of sharing use case elements, and the API that iSee team aims at providing to support both parties in meeting their engagement. Ultimately these obligations from both parties, and the system API at the core of the integration will be described in the final version of this document and in the Use case API integration contractual agreement.

The term “local IT user” represents any company’s IT department or contact who wants to use iSee cockpit to define their use case but not necessarily using the hosted platform. iSee offers to external users three main items : the cockpit tool, the explainer catalogue and the case base hosted on our iSee platform. They expect to receive advice from iSee, about explanation

strategies (in a Behaviour Tree format) and evaluation questions associated with the goal of their use case (part of the Behaviour tree as well).

Any local IT user (as any user) will have to agree and sign an iSee utilisation agreement document in which the utilisation rules of iSee tools are detailed. The company who wants to use iSee, will have to accept this agreement document. By which agreement, the company accepts to share/upload the company use case including the result of their user evaluation of explanation (the use case here is composed from the problem requirements (“problem” part), the explanation strategies (“solution” part), the dialog of evaluation questions and answers that is saved by the dialog manager of iSee) and the feedbacks from end users (“outcome” part) ; in return we (iSee team) offer them to consume our explainer catalogue and case base.

To summarise the obligations of local IT user :

- 1) Design users should share the explanation requirements which will form the Problem part of iSee case and will allow provisioning iSee with a new seed case in its case base. Such a seed case is just another item for potential execution of iSee strategies, although it is not complete enough to be part of the iSee use case it is important for the analytics to record it.
 - a) In return iSee should provide a service for explanation strategy retrieval. Indeed the strategy reuse or revision is not relevant at the first stage of seed case provision. it will become relevant once the IT user is able to share some Q&A based evaluation track of the iSee strategy.
- 2) Local IT users should have in mind a process to gather end users feedback and evaluate the iSee strategy. iSee strategy is in the format of an executable behaviour tree object, executable using the iSee cockpit (local or hosted) and the iSee dialog manager (local or hosted). Then they should share the outcome of Q&A based evaluation track as well as business-goals-related feedback. This is important for iSee to receive this information since it is the required stage before completing a full use case in iSee CBR base.
 - a) The Q&A track object will allow provisioning iSee with the complete case. In return iSee should provide a service for calculating aggregated metrics of a set of given explanation results.

To achieve this, API integration work is specified in this document. The API needed is there to support the execution of the behaviour tree object mentioned above. The typical case is where an external company does not want to use the iSee cockpit platform or do not want to share their data (confidentiality wise) but still want to plug an explanation layer to their prediction models.

Choice between two approaches

Assuming the behaviour tree is represented in an exportable structure (json format for instance), then we have 2 options to provide the explanation

1) The Behaviour tree remains on the iSee platform and the company calls an API that returns the next node in the behaviour tree to execute, and then invokes this explanation strategy as a service (restless web service allowing us to not store any customer data) to get the result returned. The drawback is that the integration process is complex since the company infrastructure will have to call iSee services for every behaviour tree node and iSee will have to remember the execution last point on the Behaviour tree (since each API call will process a partial execution only).

2) The 2d option is the one that has been finally selected for the project:

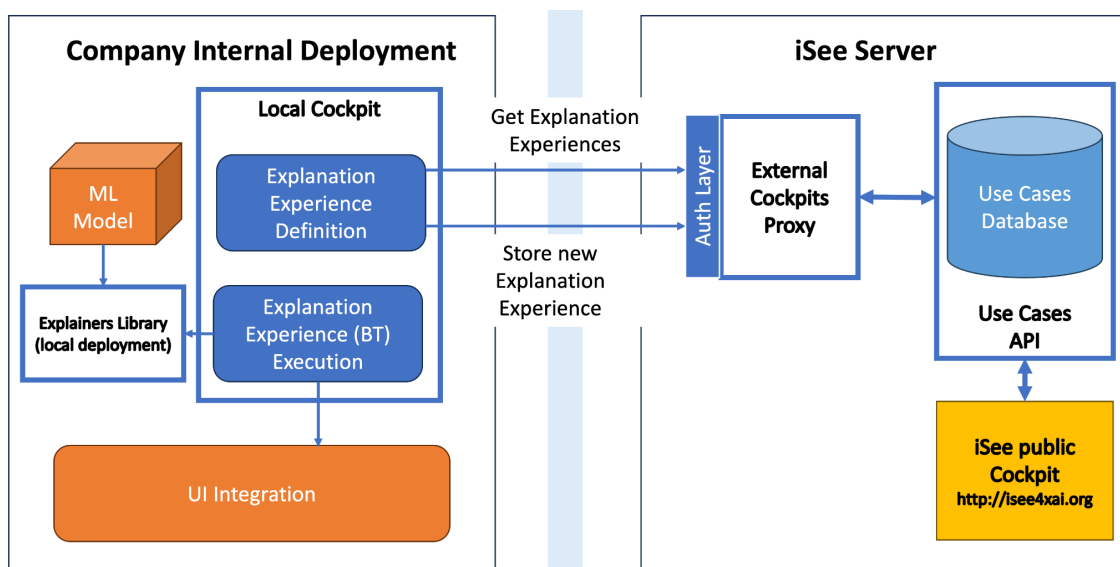
The whole Behaviour Tree object is returned by the API (explanation experience-as-a-service mode) and the company will install a local copy of the cockpit to execute the Behaviour Tree object.

→ There is a need for a docker installation protocol to ease the copying of the iSee cockpit.

→ There is a need for an API to query our explainer catalogue and case base of our cockpit on the iSee platform server.

→ There is a need for an API for the company to send the result of the dialog with user answers to the evaluation questions.

Flow illustrating how the APIs will be used



- Local cockpit is deployed in the company internal system.
- The Explainers Library is also deployed in the company internal system (local copy).

- For seed case definition (problem and Behaviour Tree explanation strategy retrieval), the local cockpit connects to the iSee server through the Integration Module API.
- Once the seed case has been defined and validated, it is uploaded to the iSee server automatically or by pressing a button “commit” from the iSee Cockpit user interface.
- The local cockpit executes the defined Behaviour Tree calling the local deployment of the explainers library, with in input the Machine-Learning model (cf. D4.1 for further details on the interaction engine).
- This is walking through the embedded Q&A script for a given data instance and the local dialog manager (or any other chat-bot like local tool) records the dialog session
- Once a dialog session is closed, the result is (automatically or not) uploaded to the iSee server.
- The local tool can request the aggregated metrics of success of the explanation experience within the company community, which they can analyse in terms of popularity, quality, suitability of explanation strategy.

This document is complemented by Deliverable “D2.1b API for external contributors”, Deliverable D3.5 section on “complete and Seed cases”.

API specification

2 stages :

- 1) After a case contains at least Problem and Solution parts, it can be published in iSee cockpit. We need to upload only the representation part that is needed for iSee to have a seed case in its base.
- 2) After the evaluation by the end user (through the dialog support), we need to upload the outcome (answers and questions -using the existing structure maybe).

Integration case 1 : iSee platform → local cockpit : provide the explanation strategies. (retrieval)

Users (of a local tool instead of the hosted iSee platform) must provide the Problem structure of a case to iSee, while the iSee platform will offer in return a service to retrieve the suitable explanation strategies, once receiving the Problem representation, as well as a new Use Case Identifier. When receiving the *Problem* representation, iSee will retrieve explanation strategies (*Solution* part) and store Problem and Solution parts as a new seed case. (D3.5 details the 3 parts of an iSee case).

The retrieval of explanation strategies from a local deployment of the iSee Cockpit will require an API call to iSee CBR service. Below is outlined the required input for iSee to be able to retrieve a set of explanation strategies (the “Solution” part of a case).

The use case data is to be sent as a POST request to <https://cbr-dev.isee4xai.com/dev/retrieve> with the request body as follows:

```
{
  "data": [
    {
      "name": <Feature name>,
      "value": <Feature value>,
      "weight": <Feature weight> (optional, default=5)
    },
    ...
  ],
  "projectId": <project_id>,
  "topK": <size>, (optional, default=5)
}
```

The 'projectId' identifies the iSee casebase from which the explanation strategies are retrieved. This project Id may not be present at the first call since the new case is not in the seed case base yet of iSee. 'Feature weight' is a non-negative number with default values currently set to 1.

Possible 'Feature names' are as follows:

- DatasetType
- AITask
- AIMethod
- Portability
- ExplainerConcurrentness
- ExplanationPresentation
- ExplanationScope
- ExplanationTarget
- TechnicalFacilities
- AIKnowledgeLevel
- DomainKnowledgeLevel
- UserQuestion
- UserQuestionTarget
- UserIntent

The following is an example request.

```
POST https://cbr-dev.isee4xai.com/dev/retrieve
{
  "data": [
    {
      "name": "AITask",
      "value": "http://www.w3id.org/iSeeOnto/aimodel#Binary_Classification",
      "weight": 3
    },
    {
      "name": "DatasetType",
      "value": "http://www.w3id.org/iSeeOnto/explainer#multivariate"
    }
  ],
  "projectId": "isee123"
}
```

The API response includes an array of the most similar cases with explanation strategies (behaviour tree representation) as the case solutions. The response object is in JSON format including the behaviour tree solutions.

The ProjectId is the unique id for the just created seed case. For any other calls to iSee API, the ProjectId will be used as a unique reference to the case of the local user.

Integration case 2 : iSee platform → local tool of the external user : provide the explanation strategies (retrieval)

This integration example is a variant of the integration case 1 where the user accepts to use the hosted iSee platform (not a local one) but wants to consume the explanation strategies on one of their local compliant tool (not necessarily iSee cockpit).

The retrieval of explanation strategies from a third-party application will require an API call to iSee CBR service. The request method, API endpoint and request body are the same as integration case 1 above.

the request body will contain the project Id in this case since the case is already in iSee hosted platform.

The response will contain the json structure of the explanation strategy and pointers to the explainers algorithm.

Integration case 3 : local cockpit or a local compatible tool → iSee platform : provide the Explanation Experience (new content)

Users (of a local tool instead of the iSee platform) must try to run the evaluation process , either by using the iSee dialog manager or their own tool. The result of the dialog, together with user profile, data instance and user feedback, will form the Explanation Experience, i.e. the *Outcome* part of the iSee case (cf D3.5). Since iSee aims at capturing for further reusing the explanation experience, we will ask users to provide the dialog track to iSee Platform. In return, iSee will offer a service to calculate aggregated metrics once receiving the Outcome and the UseCase Identifier ('projectId' feature). When receiving the dialogQ&A track representation and the UseCase Identifier, iSee will store it as an 'Outcome' part to the relevant case in its base, and calculate the quality metrics of aggregated results for this case (e.g. satisfaction, transparency, confidence). This will then form a full case.

There is no set minimum list of attributes for adding a new full case as all the attributes are optional. However, a name ("Name" attribute value) or "projectId" to identify the case will be useful (and may become required in future). Also, the first level filtering during retrieval is currently done using the "DatasetType" attribute value (as described in D3.1). Accordingly, including a value for DatasetType will benefit a case's retrievability.

This will require a new API accepting the use case unique Identifier, with some data set instance, a Persona value and an intent, explanation needs or question reflecting the intent (this question must be one of the seed case previously uploaded). The request should contain as well the Question & Answer instance with user responses. Paper published at ICCBR 2023 by RGU team describes how these elements can be structured into a behaviour tree so that iSee can perform retention algorithms on the full case. Thus the request provided by the local user will be used by iSee platform to complete the seed case and store it as a full case, including the evaluation section.

The response from ISee API will contain some metrics, such as the one already exposed on the iSee analytics dashboard (cf D4.4c deliverable).

Details of the request json and response will be added at the next release of this document.

Request elements (user to iSee)		Response elements (iSee to user)
Problem	Domain AI Model* Dataset* Personas Evaluation Intents	projectId, caselid = the unique identifier of the Seed Case storage Solution: ExplanationStrategy object
		Explanation Strategy = Behaviour Tree Object, containing Explainer Algorithms

Request elements (user to iSee)		Response elements (iSee to user)
Problem reference	Caseld	Metrics = User Analytics Compliance Scores
Outcome	User Evaluation Results EE Compliance Results	

Summary of the 2 interaction with local users

Conclusion

This document focuses on the case of external companies wishing to integrate with iSee without using the software pieces (called “local users”), then iSee is responsible for exposing an integration API specifying what local users can expect from iSee as-a-service and what iSee expects from local users according to the terms of use that are in D5.4b.

Aligned with the principles of using co-creation approach to increase and socialise the knowledge about Explanation experience reuse across sectors, the project team is building Use Case integration API and advocate the local users to use this API when they prefer using a locally installed version of the iSee Cockpit. The present document aims at drafting the obligations of iSee and these so-called local users, in terms of sharing use case elements, and the API that iSee team aims at providing to support both parties in meeting their engagement. Ultimately these obligations from both parties, and the system API at the core of the integration will be described in the final version of this document and in the Use case API integration contractual agreement.

Next step is to implement the API, feature-proof it on real use cases, and finalise the contract document between iSee and users.

Annex

Example of dialog Q&A

Sub-tree	Actor	Utterance	Options
Greet	Bot	Hello! I am the iSee chatbot for the {use case name}. Would you like to proceed?	Yes, No
	User	Yes or No	Yes

Persona	Bot	Before we proceed with explanations for the {use case name}, I would like to know more about your knowledge of AI. How would you describe your expertise in AI?	6 knowledge levels No knowledge, novice, advanced beginner, competent, proficient, expert
	User	I have no understanding of AI technology...	No knowledge
	Bot	How would you describe your knowledge about the fracture detection domain?	6 knowledge levels No knowledge, novice, advanced beginner, competent, proficient, expert
	User	I have been a practising clinician for 12 years. So I would say I am very knowledgeable...	expert
	Bot	Thank you for answering these questions. Your responses suggests that your explanation needs are likely to be similar to that of a "Clinician" . Therefore your persona for this session is set to "Clinician". or Thank you. We could not find a matching persona for the details provided. Please try again.	Persona: clinician Persona: not found
Explanation Need	Bot	Next I want to understand what kind of explanation you want. Please select a question below if it is similar to what you would like to know, or tell me what you would like to know. 1. Why is this Radiograph classified as "fracture"? 2. Show me similar Radiographs that also belong to the same "fracture" class?	User questions configured for the persona
	User	Question 2 sounds like what I need to know about this specific Radiograph Or I have a specific question , I want to know	Question, intent, target type
	Bot	If target is a prediction Can you confirm this is the Radiograph for which you need an explanation? and the outcome you received is that it contains a fraction? or Can you please upload the radiograph? If target is the model or data → no follow up questions	a radiograph the AI model outcome for this radiograph
	User	Yes that is correct	a radiograph the AI model outcome for this radiograph
	Bot	Thanks, Let me find an explanation for you.	
Explanation Strategy	Bot	Here are the two other Radiographs from our database that are most similar to your Radiograph.	2 nearest-like-neighb ours

			<image1> <image2>
	Bot	What do you think?	
	User	Okay. I see why the system thinks this is a fracture. What else can you tell me about this Radiograph?	Indication of (need more)
Explanation Need	Bot	I can also answer Question 1 1. Why is this Radiograph marked as "fracture"?	User questions configured for the persona
	User	Okay	
Explanation Strategy	Bot	Here is the radiograph overlay heatmap where red indicates the areas that have contributed most to determining this to be a fracture by the AI system	Image + IG weighted as a heatmap <image + heatmap>
	Bot	Do you think we got it right?	
	User	I'm not sure.	
Evaluation	Bot	Thank you for your feedback. Would you like to answer a few questions about your overall experience?	
	User	Sure	
	Bot	I have three statements, for each one please answer with a response from the options presented.	
	Bot	1: The explanations that were presented had sufficient detail.	Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
	User	Agree	Agree
	Bot	2: The explanations let me know how accurate or reliable the system is.	Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
	User	Neutral	Neutral
	Bot	3: The explanation lets me know how trustworthy the system is.	Strongly agree, Agree, Neutral, Disagree, Strongly Disagree
	User	Agree	Agree
	Bot	Thank you for your feedback. Have a nice day!	