usBIM.platform

CDE

User Manual

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1 Introduction

The **usBIM.platform CDE** is a collaborative BIM platform, developed to organize all the activities of the construction lifecycle, starting from the design phase, up to the construction and subsequent assets management phase. 19650 : "Organization of information about construction works Information management".
The solution developed by ACCA Software is qualified by the National Cybersecurity Agency "ACN" with qualification level QC1 and at the same time complies with ISO 27001, the international standard for information security.

The platform aims at helping professionals in the architecture, engineering and more generally in the construction sector (AEC) to correctly create and manage BIM models produced from each discipline, in a single Common Data Environment (CDE), in accordance with the international standards on the subject).

The basic concept underpinning the collaborative platform is the use of open formats, such as the IFC standard promoted by buildingSMART, the independent organization that sponsors the development of innovative practices in the construction industry. The buildingSMART certification guarantees the correct creation, management and sharing of data, documents and models among all the subjects involved, regardless of the BIM authoring software used.

The product meets two main needs:

- It allows a global control of the construction processes;
- It follows the provisions of the BIM Procurement Codes.

usBIM.platform allows you to manage the BIM models that comes from each discipline (architecture, plant design, energy, structures, building site and maintenance) in a single CDE, as it is shown in Figure 1

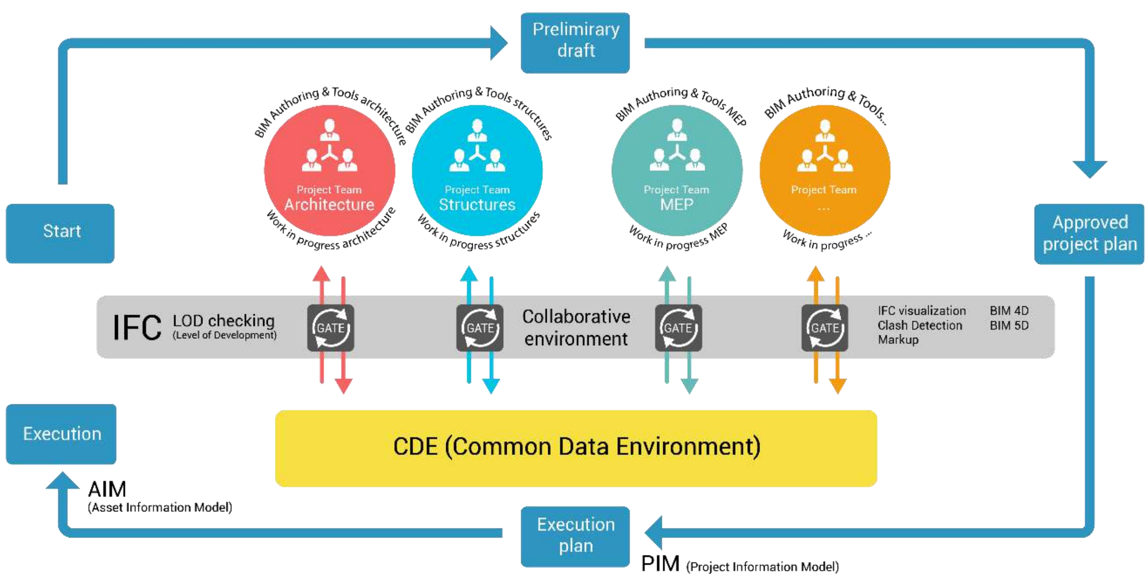

Figure *1. BIM models creation and management on usBIM.platform*

The platform is a combination of

- technologies that guarantee the correct data flow when creating a BIM model;
- advanced functions that allow you to comply with the requirement indicated in the "BIM call for tender" specifications according to the national procurement codes and standards.

The Common Data Environment available on the platform is completely customizable based on the organizational schemes provided by tender documents.

The CDE contained in usBIM.platform provides specific communication tools and document exchange functions that guarantee the correct project workflow execution. Moreover, it supports the collaboration among professionals across different disciplines. Here are the main benefits:

- automatic workflows and procedures;
- traceability of information and decisions, avoiding potential conflicts;
- limitation of data redundancy with a consequent reduction of the risks linked to their duplication;
- seamless communication between the parties involved through specific modules and forms (i.e., information requests, notification tools, etc.);
- information transparency regarding data ownership, actions performed on it and accessibility to information over time

usBIM.platform is available on any device (PC, laptop, tablet, smartphone) and allows you to use both open and proprietary formats for information exchange.

The platform is designed and developed to follow the requirements of ISO 19650

A brief overview of the platform's macro-functionalities is provided below.

- Authentication: access to the platform is governed by an authentication mechanism based on the use of username and password.
- CDE: the Common Data Environment can be customized and allows the structuring of the workspace, document management and automatic document versioning.
- User profiling: allows you to manage the work environment by assigning roles, responsibilities and the relative access permissions to the workbooks, contents and functions of the platform.
- Group Management: each user can be linked to different Groups. Groups and Companies can in turn be defined and modified within the platform.

- **Logging and Auditing**: the system keeps track of the operations performed on different levels (events relating to system, subscription, process and single document), ensuring a timeline of revisions and changes applied to the shared data.
- **Workflow Management**: this feature allows to create and streamline processes and procedures, by facilitating the control and provision of the latest up-to-date versions of the documentation.
- **Gates**: it is possible to build Gates for the definition and implementation of revision / validation procedures of the project documentation, according to national procurement codes, such as when sharing or delivering models and drawings.
- **#TagBIM**: this function allows you to add metadata, that is, to tag documents, models and objects contained in the IFC models with alphanumeric strings structured in #Tag. With the use of #TagBIM strings it is possible to add DATA to documents, models and objects. The #TagBIM transforms the CDE, from a mere file container, into a structured DATABASE, consequentially enabling advanced search functions of information, files and objects in usBIM.platform and in the relating services.
- **Integration with online services**: usBIM.platform integrates the usBIM.browser online service that allows you to view, browse, add information and manage BIM models. This service allows you to:
  - view, federate and manage online models and documents in the IFC standard format and in other supported formats (including the Portable Document Format, commonly referred to as PDF);
  - browse online models, documents and drawings simultaneously thanks to the presence of hyperlinks;
  - add information to model objects in supported formats (including IFC format) by associating metadata;
  - Access project drawings or descriptive documents, construction details, technical requirements, prescriptions and other documentation linked to the IFC objects on the models;
  - Manage issues and markup directly on 2D and 3D files;
  - collaborative working on all supported file formats.

Through this service, the IFC models become the geolocation of the document information stored in the CDE and are enriched with DATA thanks to the use of #TagBIM strings.

- **Notifications**: users receive notifications via e-mail relating to events that occur within the platform (document management, workflow, etc.).
- **Services deployment**: usBIM.platform is a Cloud-based technology and the service is provided in SaaS - Software as a Service mode. The security of the information is ensured via the "https" protocol. Moreover,

data accessibility is possible through any device connected to the internet, while data recovery is applied in case of partial or total data loss due to exceptional events.

- **Geographical location of the technological infrastructure and data**: data storage and the services provided by the usBIM.platform platform work on cloud technological infrastructures that exclusively manage and save information within EU territories. The infrastructures used to provide the services follow the CISPE code of conduct (Cloud Infrastructure Services Providers in Europe), which ensures the use, by technology suppliers, of adequate data protection systems, in line with the provisions of the new legislation. European Data Protection Regulation GDPR (General Data Protection Regulation).
- **Consultation and storage of data**: upon specific request, it is possible to export data relating to the projects managed in the CDE from the cloud.

Digital collaborative platforms represent an evolution of EFSS (Enterprise File Synchronization and Sharing) products and address digital strategies related to productivity, team collaboration and workflow automation. The usBIM Integrated System product family includes the integration of open digital platforms, plug-ins and BIM authoring software capable of managing the digital BIM model in all phases of the construction life cycle, from the design to construction and maintenance or disposal phases. The basic operation of this integration is represented by the freeMDD (free Models, Documents and Data) open collaborative protocol, which allows to obtain the real BIM model of the building, with information displayed in open formats that can be consulted and managed online.

Through usBIM.platform, direct communication is possible between all users and applications participating in a project developed through the application of the Open BIM methodology: it therefore represents a service for managing, updating and sharing all project files in the cloud.

2 Login

To access the platform, it is necessary to log on to usBIM, the integrated system of Applications and Functions to manage the digitization of buildings and infrastructures in an easy and collaborative manner, exclusively online using any device.

You can access usBIM via https://cloud.usbim.com

To access the platform, you need to insert your Username and Password associated with your ACCA account. If you do not have this information, you can register by clicking on the "Registration" button and follow the procedure for creating your MyACCA account. You can also log in with: Google, Twitter, Apple, Facebook, X and Linkedin.

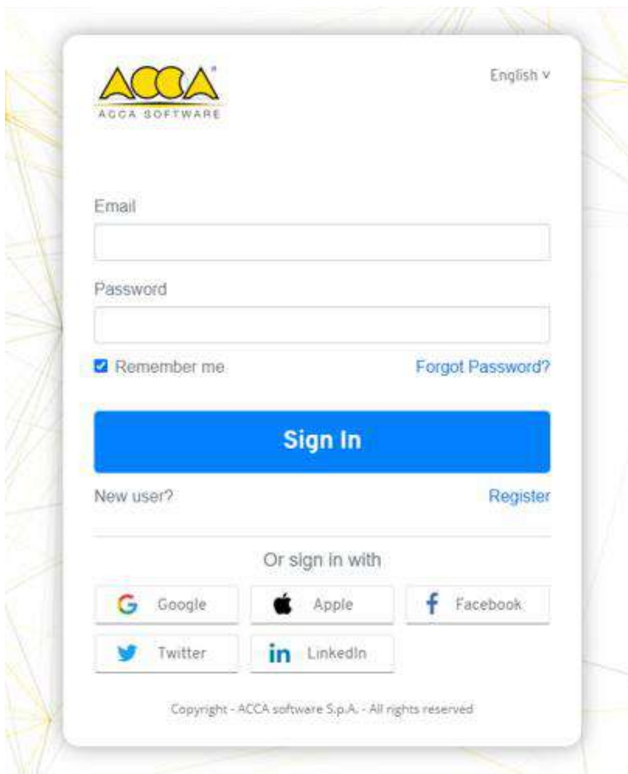

Figure *2. The Login Window*

Once you have logged in to usBIM, in the application panel (Figure 3) you will find the usBIM.platform CDE icon among the other applications available for your account. By clicking on it you will be able to access the service that meets the requirements of the BIM methodology and the UNI 11337 standard.

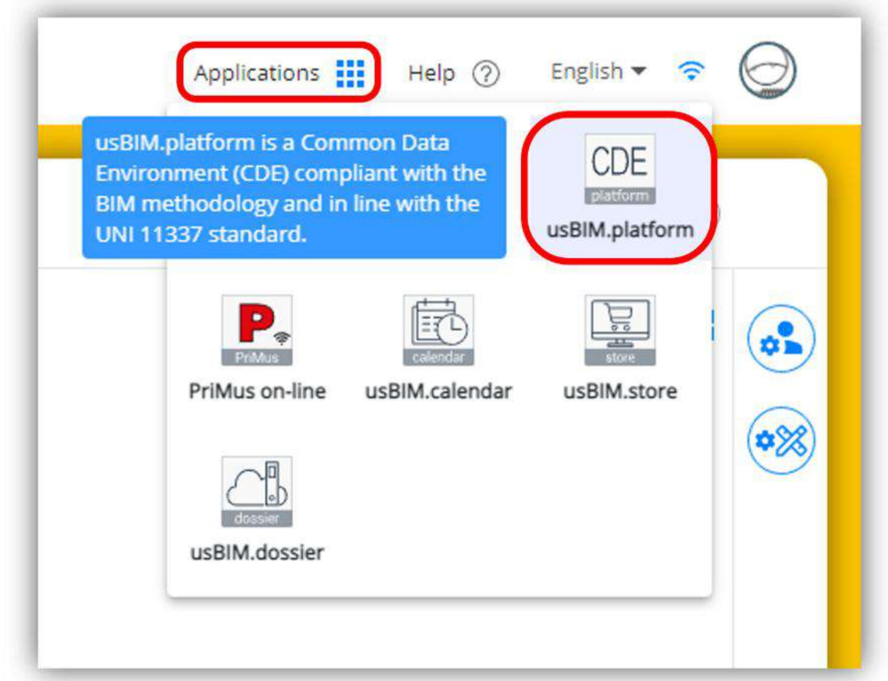

Figure *3. Application Access*

2.1 2-Factor Authentication (2FA)

The log in can also be carried out using the "2-Factor Authentication (2FA)". To activate this system it is necessary, first of all, to access the "MyACCA" section as per Arrow 1 Figure *4*.

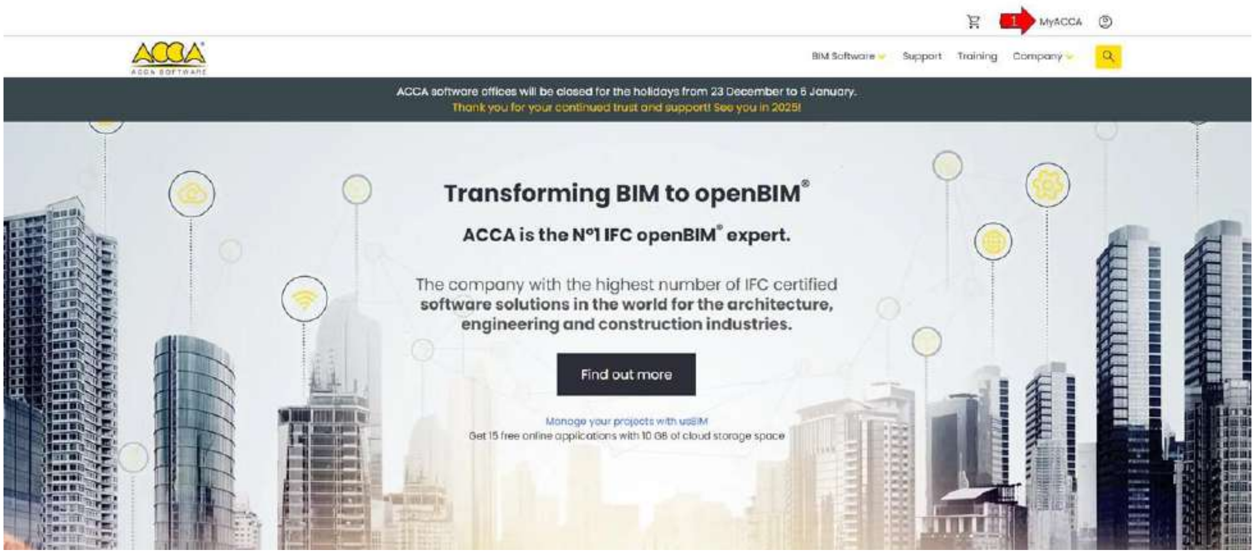

Figure *4. Access the MyACCA section*

Within the "MyACCA" section it is possible to locate the context menu located at the top right of the screen (Arrow 1 Figure *5*). Here, among those present, you must select the "View Profile" item (arrow 2 Figure *5*)

Figure *5. Identification and selection of the "View Profile" option*

On this page you can view all the information of your profile (such as, for example, address, telephone number, zip code, etc.) that can be changed as per Arrow 1. Figure *6* Alternatively, you can proceed with the activation of 2-factor authentication by clicking on "Configure the Authenticator application" (arrow 2 Figure *6*).

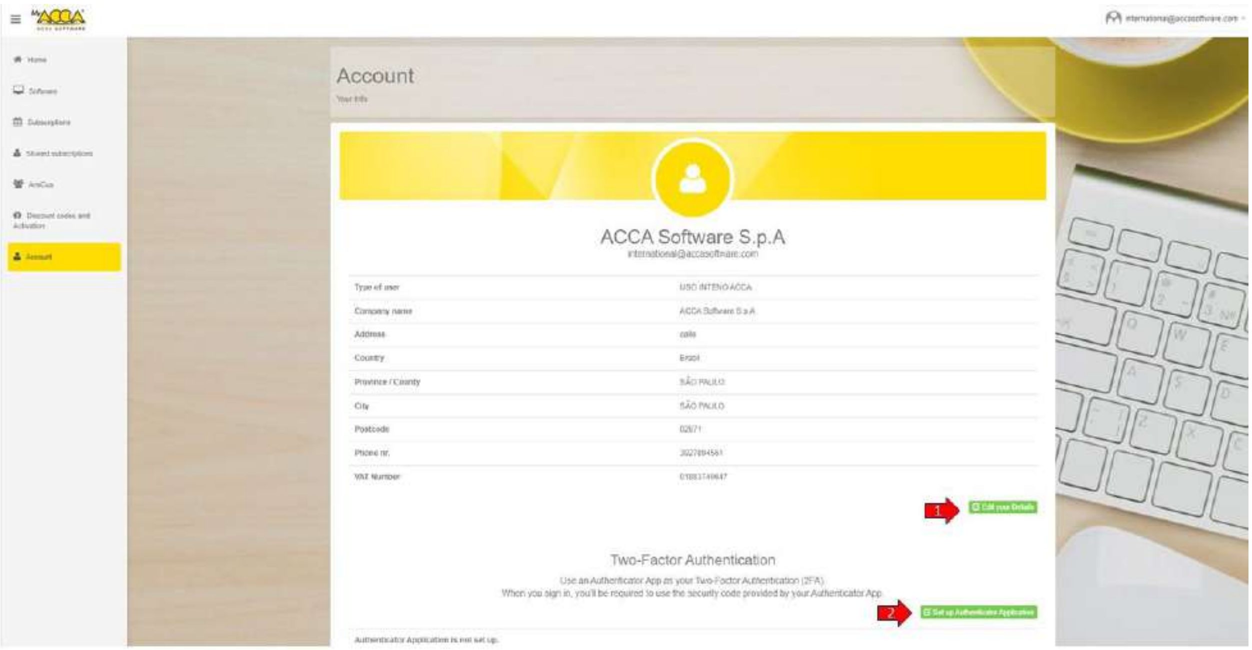

Figure *6. User Profile Screen*

This command takes you to the login window where you need to re-enter the login credentials as shown in Figure *2*.

The "Configure Mobile Authentication" screen Figure *7* is displayed in. Here are a series of steps to follow to complete the configuration operations. In particular:

- Arrow 1 - install an application, to which you associate your ACCA account, which generates a temporary code (e.g. Google Authenticator);
- Arrow 2 - scanning the QR code after opening the previously installed application;
- Arrow 3 - use of the alphanumeric code as an alternative to the QR code;
- Arrow 4 - information used by the application for the creation of the temporary code;
- Arrow 5 - field for entering the temporary code copied by the application previously installed and configured;
- Arrow 6 - field for entering the name of the authentication device.

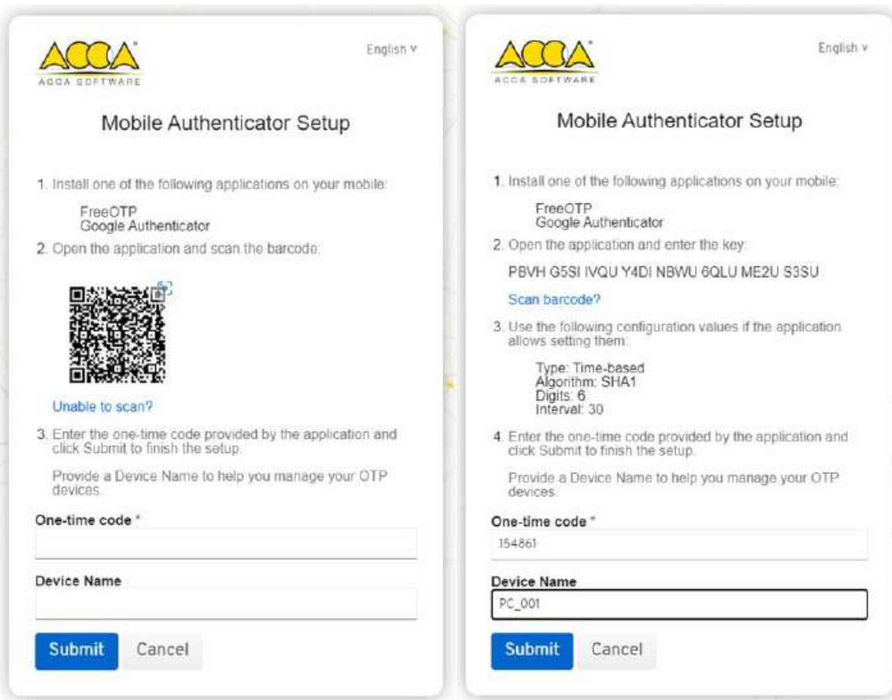

Figure *7. Configuring Mobile Authentication*

In, Figure *8* you can view the updated user profile with the information of the 2-factor authentication system. In fact, you can see both the device (Arrow 1) on which it is applied and the creation date (Arrow 2).

You can also remove this type of authentication at any time by clicking on the "Remove" command as per Arrow 3 Figure *8*.

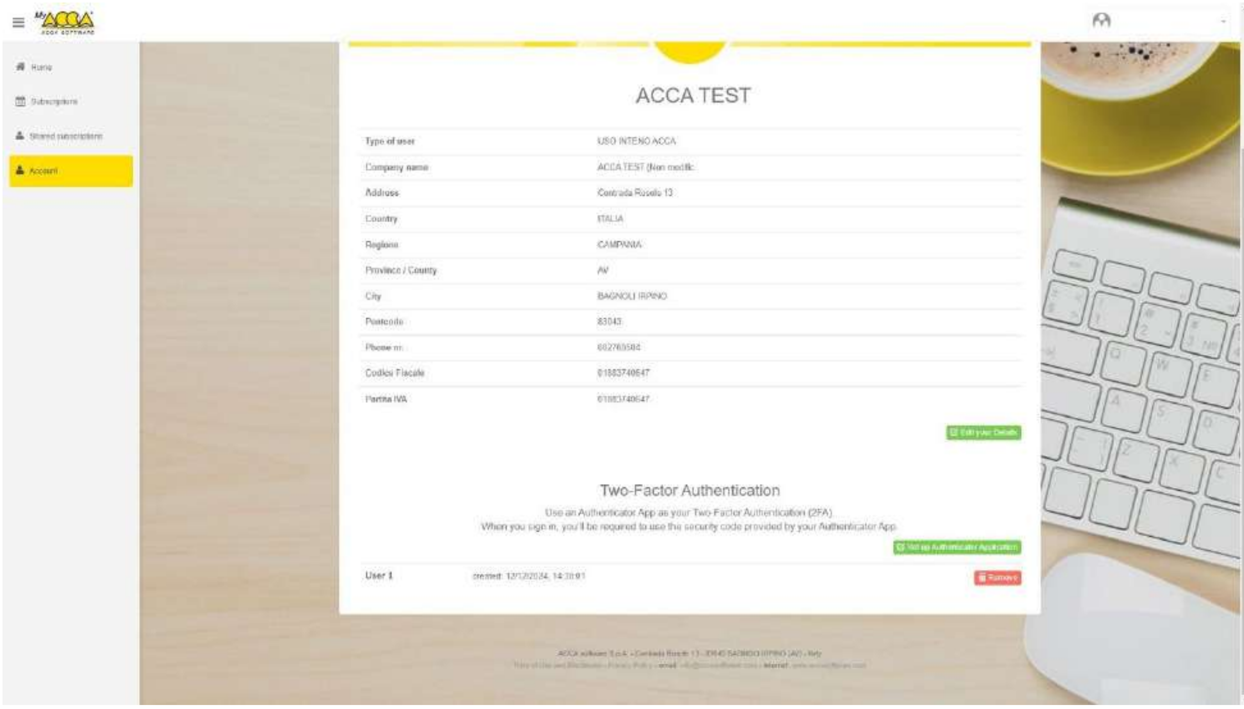

Figure *8. 2FA System Information User Profile Page*

Figure *9. 2FA System Login Screen*

3 usBIM.platform homepage

The usBIM.platform home page represents the access point to the various sections that make up the platform and that enable users, based on the role they play, to operate within it. In particular, the sections are:

1. Choose subscription
2. Home
3. Workspaces
4. Users
5. Groups
6. Licences
7. Subscription Events
8. Document Statuses

Figure *10. Home page*

3.1 Choose a Subscription

This section is only enabled for users who are added as a Platform Admin Delegate on another user's subscription. Here you have the option to choose which subscription to work on (arrow 1 Figure *10*). This includes changing the information displayed in the Home - Users - Groups - Licenses - Subscription events - Document states section.

3.2 Home

The Home section (Figure 10) shows all subscription related information; in this specific section, a summary of the number of Workspaces divided by status (active, inactive, archived), the amount of storage space used and available, the expiration of the subscription and the number of licenses is also summarised.

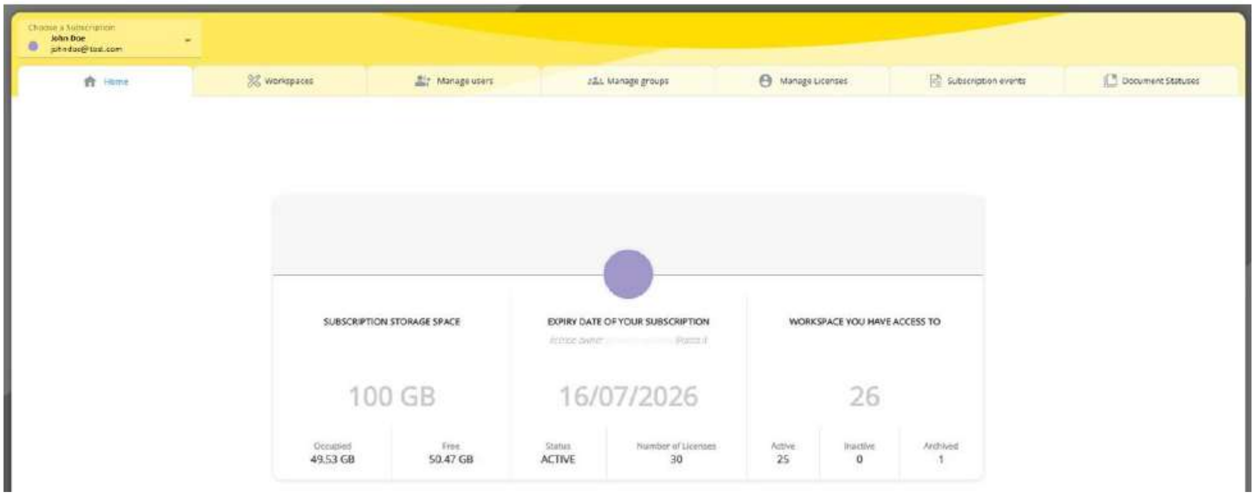

Figure *11. Home*

3.3 Workspaces

In the Workspaces section, you can view all the projects created, displaying the status (arrow 1 Figure *12*)and priority (arrow 2 Figure *12*). You can also access the project and create new workspaces (arrow 3 Figure *12*).

In particular, it will be possible to search for projects using the search bar (arrow 4 Figure *12*), filter them using #tagBIMs (arrow 5 Figure *12*), or search for them using the project geolocation on the GIS Map (arrow 6). (Arrow 6 Figure *12*).

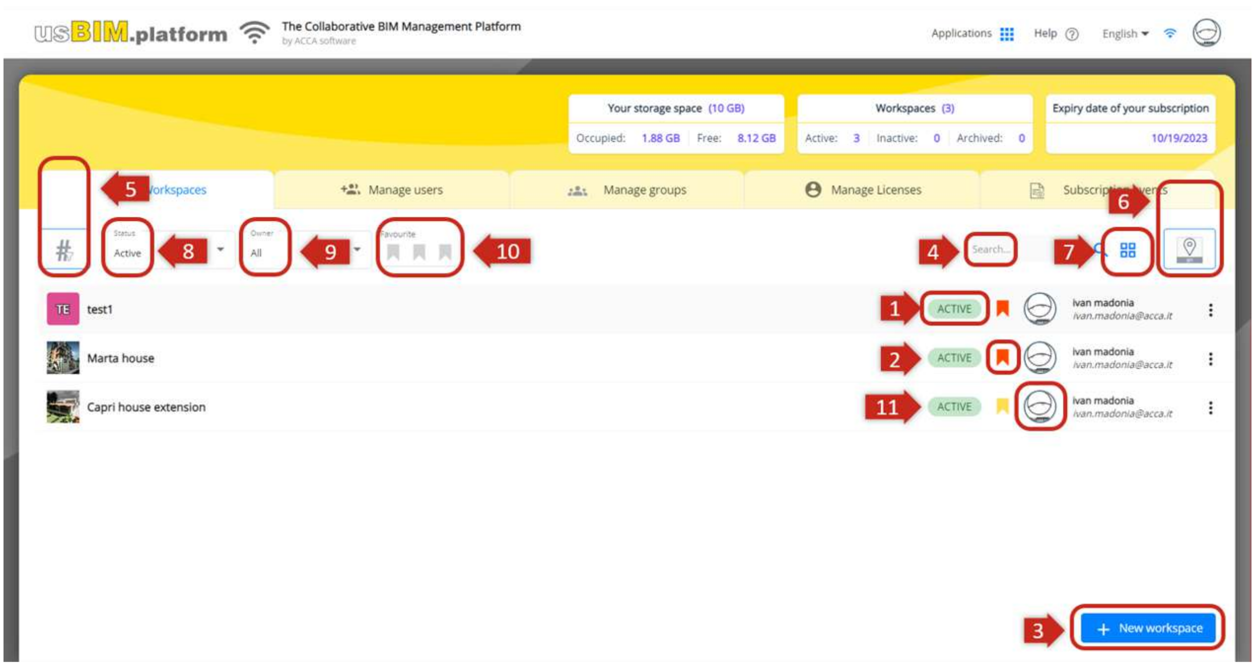

Figure 12. *Workspace Section*

It will be possible to change the view modes (table view/block view) of the Workspaces (arrow 7 Figure *12*), manage their visibility through the appropriate filters (arrow 8 Figure *12*) which will allow you to view:

- All subscription-related Workspaces;
- Only Active Workspaces;
- Only Inactive Workspaces;
- Only Archived Workspaces.

It will also be possible to manage their visibility, through the filters, according to the owner of the Workspaces, which will then allow you to view the below (arrow 9 Figure *12*):

- All;

- My Workspaces
- Shared workspaces

Another selection option will be based on the priority linked to the Workspaces (arrow 10 Figure *12*):

- Important Workspace;
- Very important workspace;
- Extremely important workspace.

Finally, you will be able to see the name of the Platform Admin of each Workspaces. (Arrow 11 Figure *12*).

Clicking on the three-dot symbol, you will get access to a menu where you can read more information about the Workspace, edit it, or view events related to the Workspace (Figure *13*).

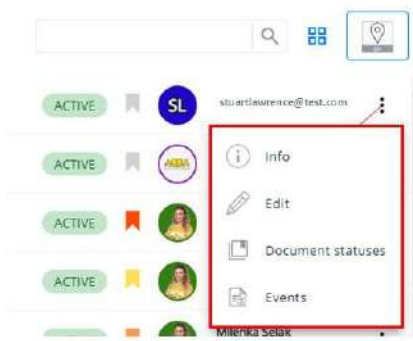

Figure *13. Menu*

3.4 Users

usBIM.platform connects all project stakeholders involved in the whole construction process, from conceptual design through construction and ultimately management. Specifically, it involves different types of users such as:

- *Platform Admin*

User profile in charge of the management of the subscription. The features available for the Platform Admin are:

  - User Management: can create one or more BIM Managers, Standard Users and Platform Admin Delegates. The Platform Admin can create a number of active users equal to the one defined during the subscription phase. Creating a user consists of filling in form with some required user details, including the e-mail address. If the user has already registered an ACCA account, they will then be able to access the platform using the same credentials, otherwise registering will be required.
  - Project Management: this function allows the PA to create new projects, assign/remove BIM Managers, assign/remove users.
  - Group Management: groups can be created and it is possible to assign/remove users.

- *Platform Admin Delegate*

This type of user has the same permissions of the Platform Admin, except for the possibility of assigning the Platform Admin Delegate role to other users.

- *BIM Manager*

This role is appointed by the Platform Admin to manage a specific project. A BIM Manager can add/remove users to the project for which he is a BIM Manager.

- *Standard user*

This is a standard profile and can only work on those projects they have been added to. The only possible option will be selecting the project they have been granted access. Should the user not be linked to any project, they will just view some information on the platform, without being able to perform any type of action.

- *Guest*

The Guest user is a standard user in all respects but with a particularity: he has partial visibility of the project structure in which he is profiled. In particular, it sees only and exclusively the folders on which it has a permission and, therefore, does not display any other project folders.

Table 1. Comparison between the different types of Users

	User / Operation	Platform Admin	Platform Admin Delegate	BIM Manager	Standard User (U; V; U+V)	Standard user (Edit)
Platform features	Project Management	✓	✓	×	×	×
	License Management	✓	×	×	×	×
	User management	✓	✓	×	×	×
	Group management	✓	✓	×	×	×
	BIM Manager Management	✓	✓	×	×	×
	Data Form Management (usBIM.data)	✓	✓	×	×	×
	Events	✓	✓	×	×	×
	Subscription Document Statuses	✓	×	×	×	×
	Upload	✓	✓	×	×	×
	Workflow	✓	✓	×	×	×
	BIM Share	✓	✓	×	×	×
Project functionality	Project Management	✓	✓	✓	×	×
	Project User Management	✓	✓	✓	×	×
	Permissions Management	✓	✓	✓	×	×
	Project Events	✓	✓	✓	×	×
	Project Document Statuses	✓	✓	✓	×	×
	Project Creation	✓	✓	✓	×	×
	Data Form Creation	✓	✓	✓	×	×
	Use of Data Forms (as attachment)	✓	✓	✓	✓	✓
	Project Workflow Creation	✓	✓	✓	×	×

	Run of Project Workflows	✓	✓	✓	✓	✓
	Creation of Folders and GATES	✓	✓	✓	×	✓
	GATE Documentation Acceptance	✓	✓	✓	×	✓
	Creation of New Documents	✓	✓	✓	×	✓
Integrated services	Viewing supported file types	✓	✓	✓	✓	✓
	BCF file creation and editing	✓	✓	✓	×	✓
	Reports Creation and Editing	✓	✓	✓	×	✓
	BCF file creation and editing	✓	✓	✓	×	✓
	Use of Data Forms (as a document)	✓	✓	✓	×	✓
	Clash Detection Creation and Editing	✓	✓	✓	×	✓
	Model Checking Creation and Editing	✓	✓	✓	×	✓
	IFC File Editing	✓	✓	✓	×	✓
	Use of Chat and Video Meetings	✓	✓	✓	✓	✓

*NB. The Platform Admin can delegate an administrator for license management if necessary. (see par. 3.6)

The section dedicated to users (highlighted in Figure *7*), allows you to have an overview of the users associated to the subscription.

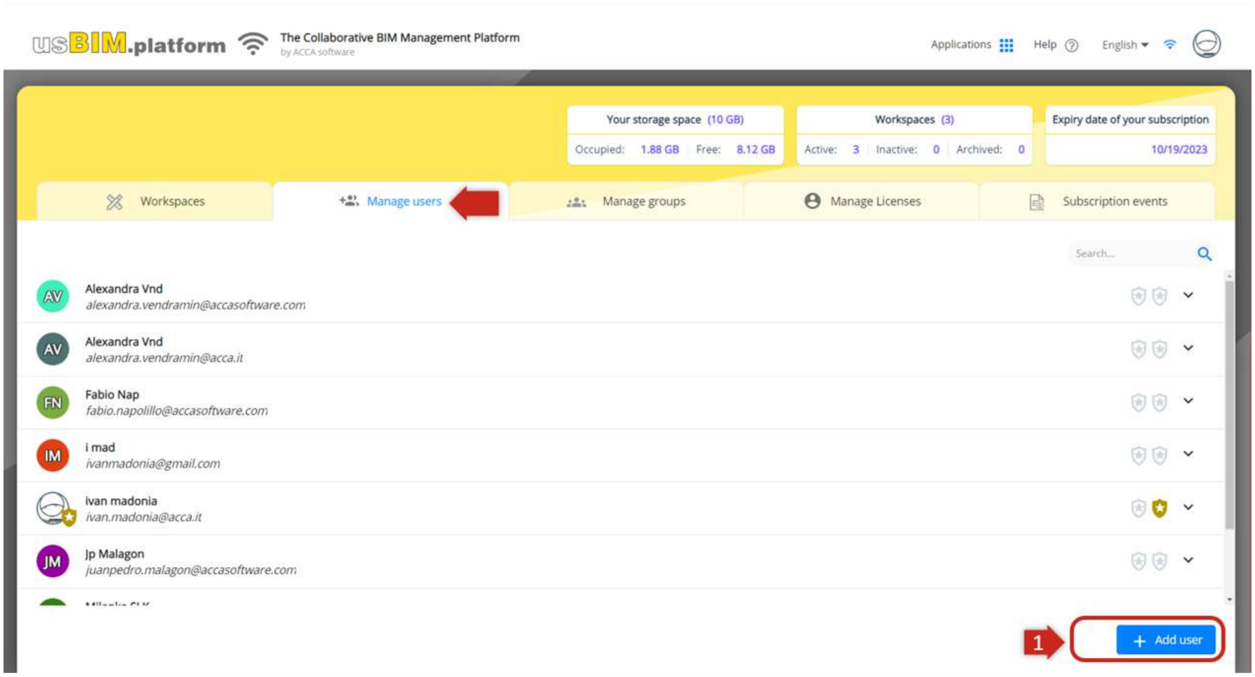

Figure *14. User section*

Even in this section, you can search for users through the search bar.

You can add new users by clicking on the button at the bottom right of the page (arrow 1 Figure *14*).

To define a new user, simply fill in the data shown in Figure *15*.

Selecting the "Add User" button opens a window with the user's data entry form. The data to be added is listed below:

- Name (Required): name of the user you are adding;
- Surname (Required field): surname of the user who is being added;
- Email (Required field): email address that the user being added has provided at the time of signing up to myACCA services;
- Upload Photo: Associate a photo with the user.

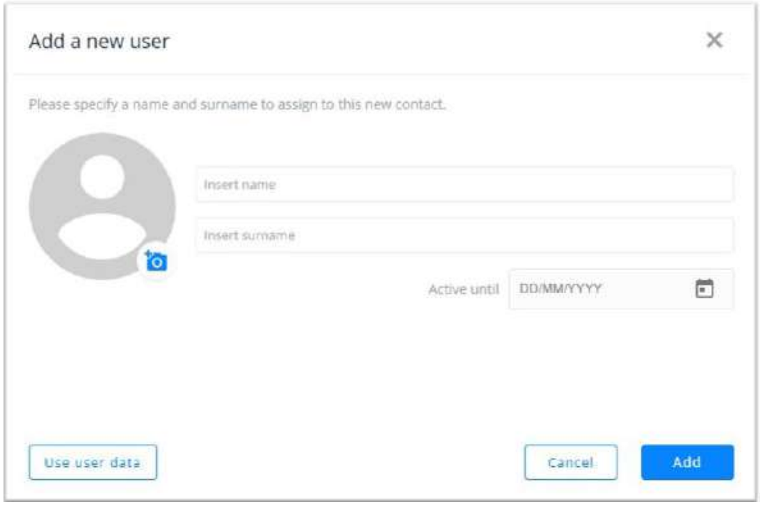

Figure *15. Adding a new user*

After adding a new user, the Platform Admin will be able to access a dedicated area from a drop-down menu, where to grant the user the ability to manage the subscription as a Platform Admin Delegate (arrow 1 Figure *16*).

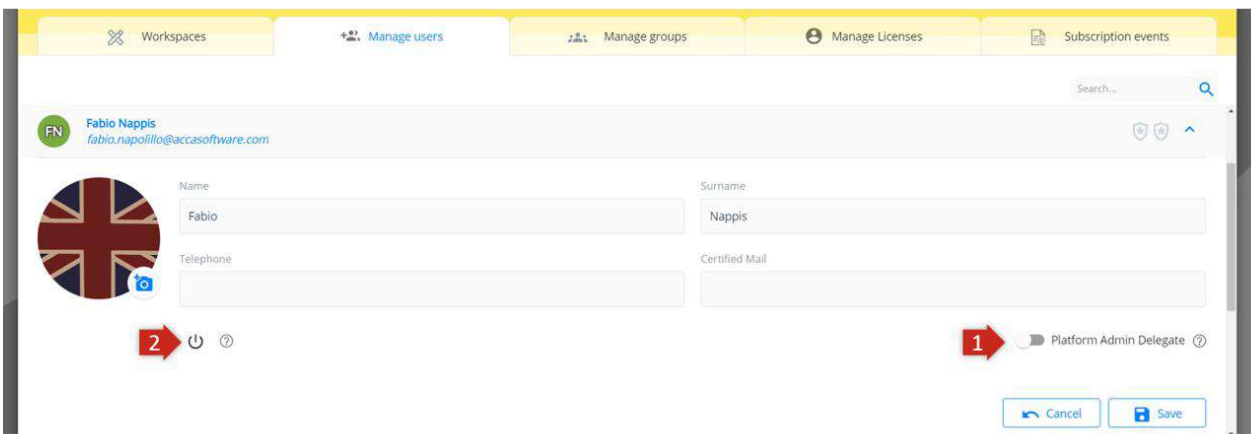

Figure *16. User profiling*

In this section it will also be possible to add:

- **Certified Email**: field to fill with the certified email address of the user being added.
- **Telephone**: field where to enter a telephone number of the user being added;

By clicking on the button signalled by (arrow 2 Figure *16*), it will be possible to activate or deactivate the User for each project.

3.5 Groups

The "Groups" section gives the option to aggregate different users to manage activities and permissions more easily. Therefore, each user can be associated with multiple groups.

By accessing the dedicated tab, the system shows the list of defined groups with the possibility of using the search bar. The image dedicated to groups is Figure *17*.

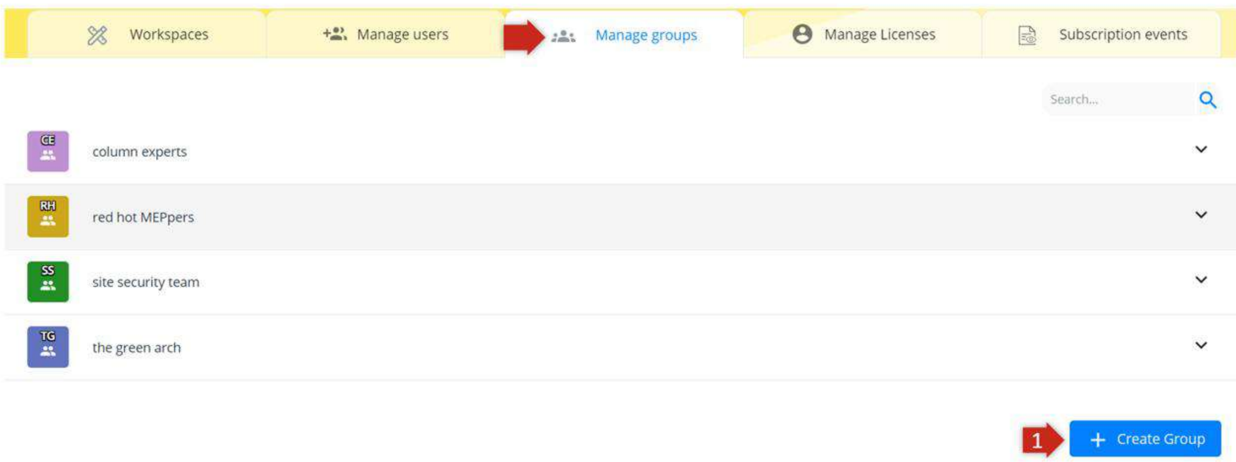

Figure *17. Groups section*

Selecting the "Create Group" will open a pop-up requiring the data related to the group being created (Figure *18*). In this case, the only required data is the name to be given to the group.

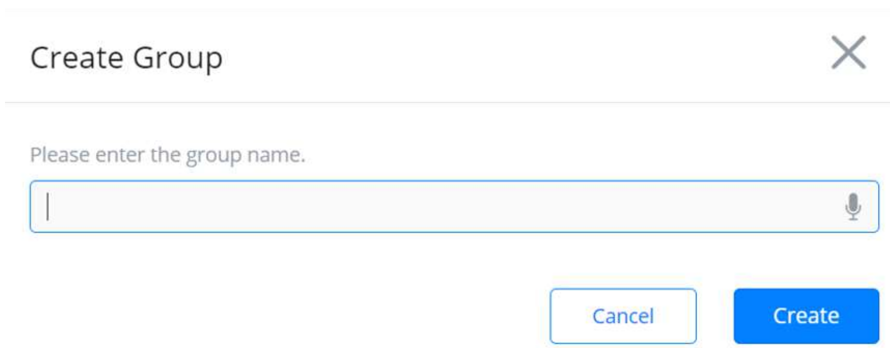

Figure *18. Add Group window*

After defining it, it will be possible to associate the various users by clicking on the "Users" button (arrow 1Figure *19*).

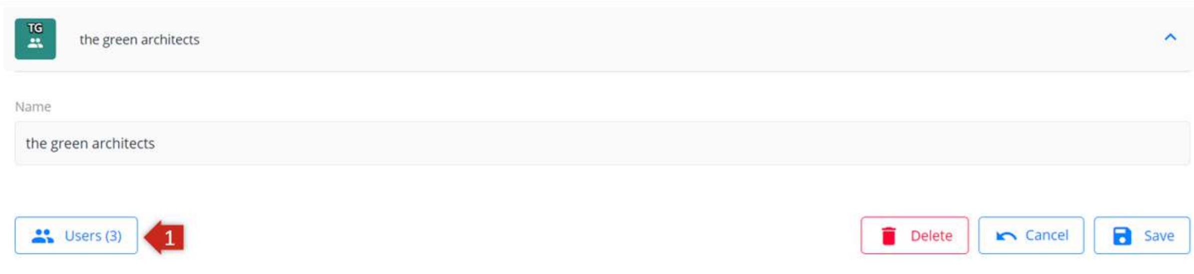

Figure *19. Group members*

A new window will pop up showing the "Assign Users" button (arrow 1 Figure *20*) and a list of those users who have already been added to the project. To confirm the operation, click on Save button.

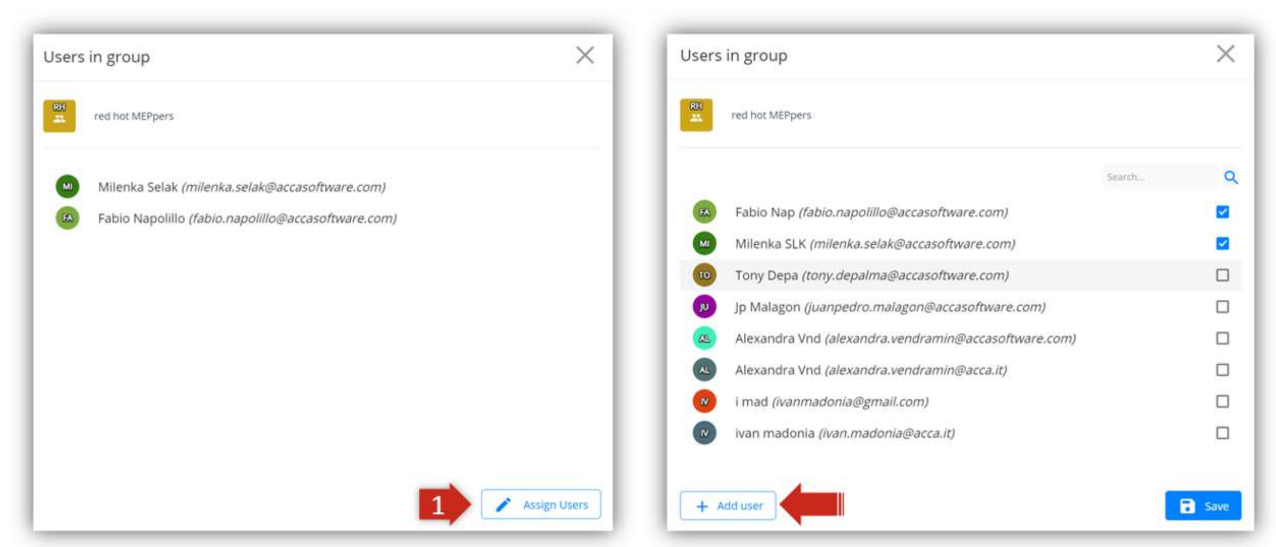

Figure *20. Adding Users to Group*

3.6 Licences

The Licenses section allows the subscription owner, or any license administrators, to enable or disable them as needed.

There are two types of licenses for usBIM applications:

1. single-user licence
2. multi-user license

In the former case, customers can purchase a single license that enables them to use a specific application. This can be done by users autonomously, from the usBIM store.

In the latter case, however, the customer can buy a greater number of licenses only through the sales department.

The multi-user license gives the customers the opportunity to enable their collaborators.

In order to be able to assign a license to the collaborator, users have a double option:

1. From the myACCA (Figure *21*) section
2. Straight from the application usBIM.platform (Figure *22*)

In the former case, users must access the myACCA section, go to "Subscriptions" and identify the application. A new window will open up, summarizing the information about the subscription. Click on the "Manage" button. At this point, an additional window will allow you to add users and manage their license activation status.

Figure *21. Subscriptions from My ACCA page*

In the latter case, the owner of the multi-user license, or the delegates, can manage the activation of the collaborators' licenses directly from the "Licenses" section (arrow 1 Figure *22*) within the application.

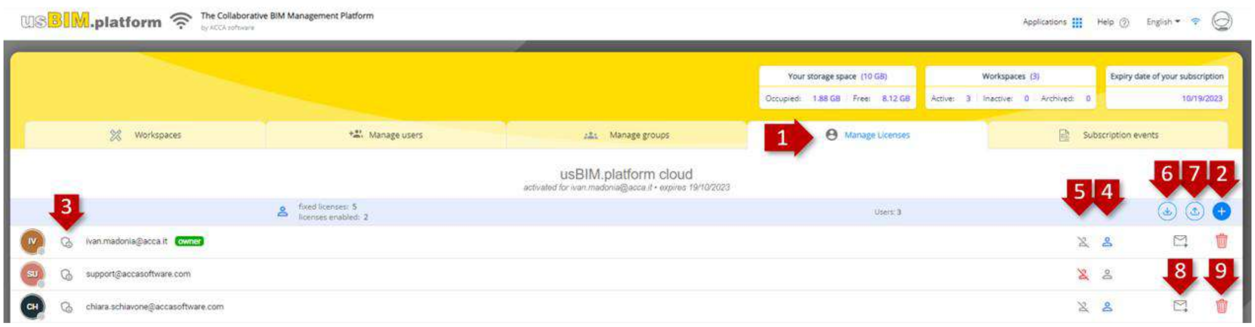

Figure *22. Licences Section*

A new user can be added by clicking on the "Add User" button (arrow 2 Figure *22*) by simply entering their email address.

The owner of the multi-user license can choose one or more administrators as a support in the licenses management (arrow 3 Figure *22*). The owner can also

- Enable a previously added user (arrow 4 Figure *22*);
- Disable a previously activated user (arrow 5 Figure *22*);
- Export a user list (arrow 6 Figure *22*);
- Import a user list (arrow 7 Figure *22*);
- Send instructions (arrow 8 Figure *22*);
- Delete users (arrow 9 Figure *22*).

Please note that, as far as usBIM.platform is concerned, the attribution of the license to a collaborator does not imply the visibility of the content of the projects. In fact, in order for the collaborator to access the projects a further permission should be granted on the desired project folders.

Furthermore, if users have their own active license, they can access another user's usBIM.platform content as long as they have permissions enabled, regardless of whether the subscription owner has activated a license for them.

3.7 Subscription Events

This section is dedicated to the functionality that allows you to track all the events that occur in the system, at different levels of detail. In particular, events are detected at the level of:

- **Subscription**: where actions carried out by the Platform Admin and delegates are tracked, including access to the platform and to the projects. In this tab, you can filter by date, search by text and export the data in summary reports;

- **Project**[1]: where all the events that concern a particular project are tracked. This section will be dealt with more in detail in the project management section (see par. 6.6);
- **Single document**[2]: dedicated area that allows you to piece together all the history relating to the document. This section will be dealt with more in detail in the project management section (see par. 6.3.4.4.5);
- **Process**[3]: where all the information relating to the decisions taken and the actions carried out on a single workflow are tracked. This section will be further analysed in the chapter dedicated to process management (see par. 6.3.6).

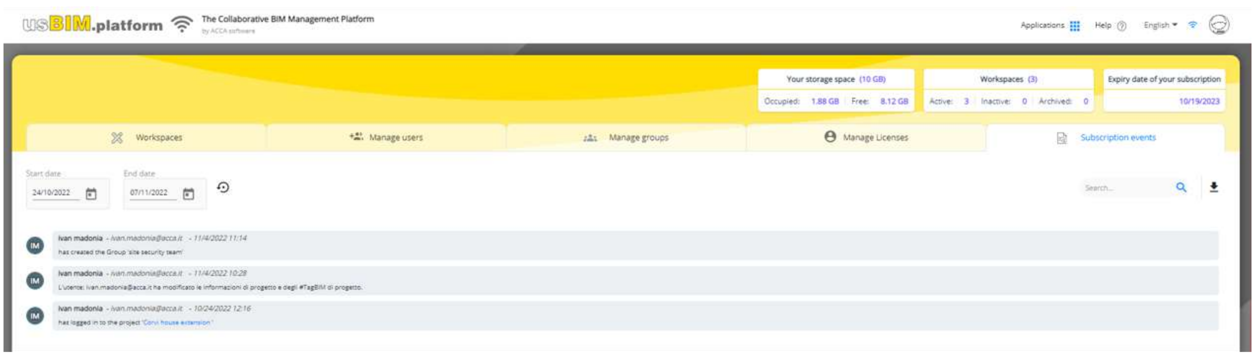

Figure *23. Subscription Events Section*

3.8 Document Statuses

This section allows you to define a centralized list of document statuses. The statuses can be defined by the Platform Admin, or by its delegates, they are customizable metadata that define the status of the document, (eg: in progress, approved, shared). The status of the document can be defined both at the subscription level and at the workspace level, to be invoked and associated with each version of the document. Only one state can be associated with each document.

To create a status, from the Home Page of the service, in the "Document statuses" section, just click on create status (Arrow 1 Figure *24*), enter a name and confirm (Arrow 2 Figure *24*).

[1]This section is also available for **BIM Manager** users.

[2]Section available to all users who have the ability to view that document.

[3]This section is available to BIM Manager users and to those users who have started the process.

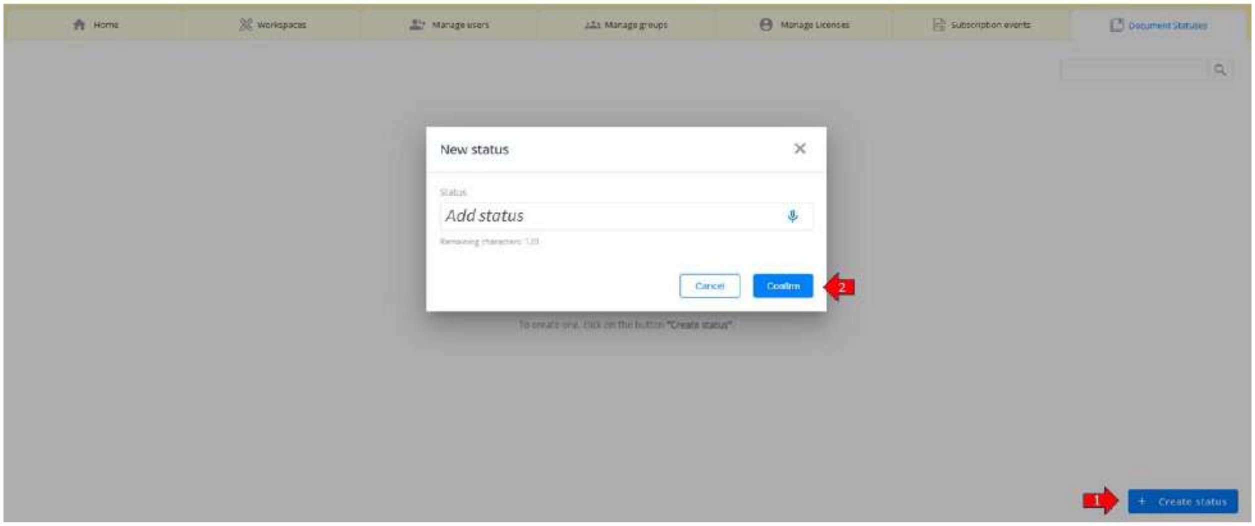

Figure *24. Document Status Section*

Figure *25*

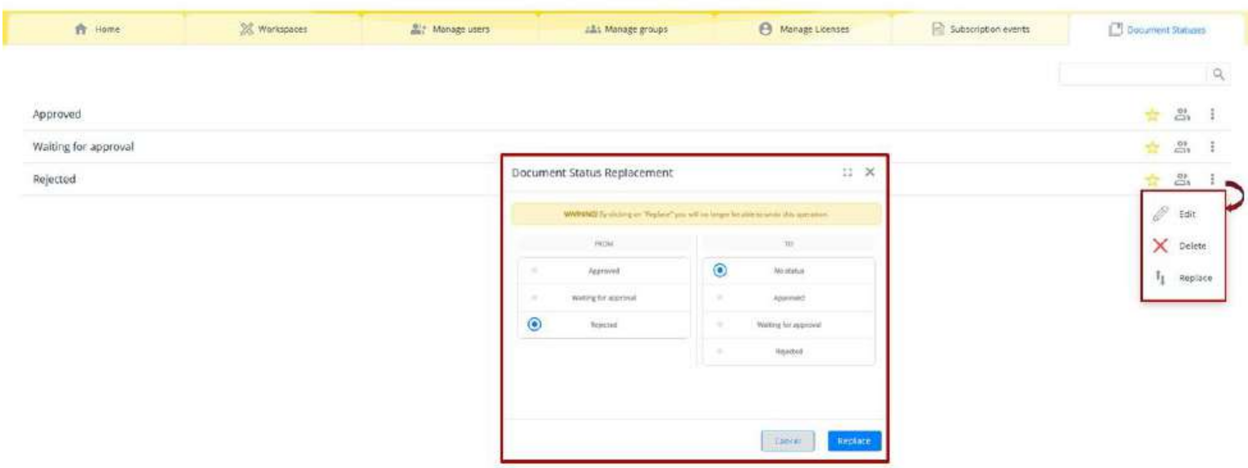

Figure *25. Document status editor*

Figure *26* In the new modal you can choose whether to add an email address or a domain (arrow 2 Figure *26*) and once you type click on Add (arrow 3 Figure *26*) and Save (arrow 4 Figure *26*).

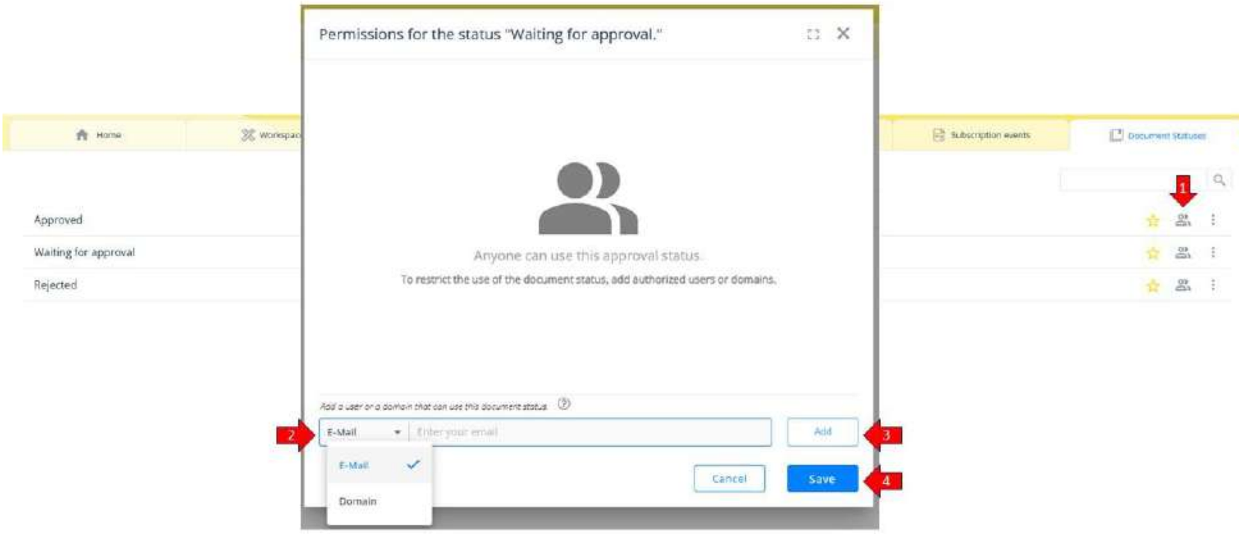

Figure *26. Managing document statuses permissions*

It is also possible to set a default status (Arrow 1 Figure *27*) which will be associated with all the documents that will be uploaded to the workspaces of the reference subscription.

Figure *27. Default Status*

The statuses can be customized at the individual workspace level (see par. 6.3.6).

4 Workflow

4.1 Definition and levels

The term "Workflow" means a sequence of interconnected activities. Defining an efficient workflow can add significant value to management process. You can, therefore, think of a workflow as a representation of a sequence of operations: it outlines the activities, steps, and users involved, along with the tools necessary for the correct performance of a business process. Workflows represent a digital tool to support the realization of a work process.

This can be defined as a set of activities connected by priority constraints and interactions in the form of exchanges of information among different users.

It's strongly advisable to be as clear and precise as possible when completing the data fields starting from the process title through to detailing the process description. This guideline is addressed to workflow users with the aim to help them when choosing the right process to use.

In usBIM.platform, workflows differ on different levels:

- **Subscription Workflow:** these are the workflows that are built by Platform Admins or their delegates; these processes can be associated with all the projects created with their subscription;
- **Project Workflows:** they are created directly on a project by Platform Admins or their delegates or by the BIM Manager.

Each workflow inherited from a different level (subscription) or from another project, can be used as a starting structure and can be customized according to the specific project requirements.

For the correct functioning of a workflow, the first thing to do is the definition of the tasks. Then, links need to be configured and users enabled. Essentially, the goal is the coordination of activities and people, in order to improve and optimize organizational efficiency.

4.2 Subscription Workflow

From the Applications menu (arrow Figure 28) you can access the "Subscription Workflows" by clicking on the "usBIM.workflow" icon (arrow 2 Figure 28).

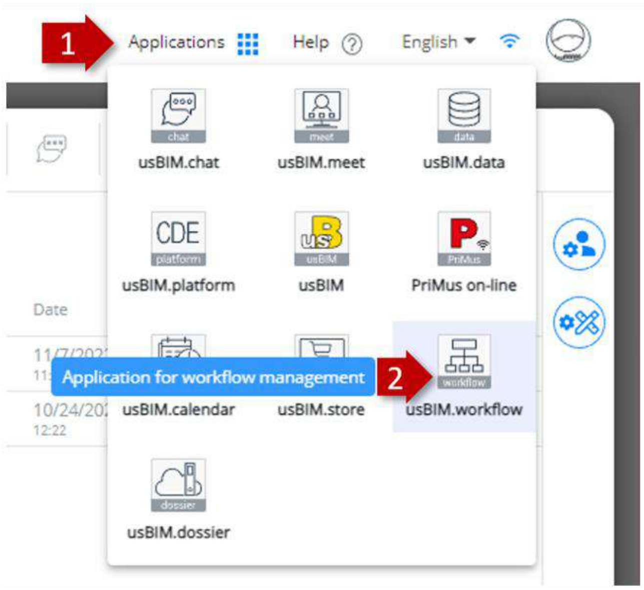

Figure *28. Subscription Workflow Selection*

This is where subscription workflows can be created and managed. They can also be inherited at project level.

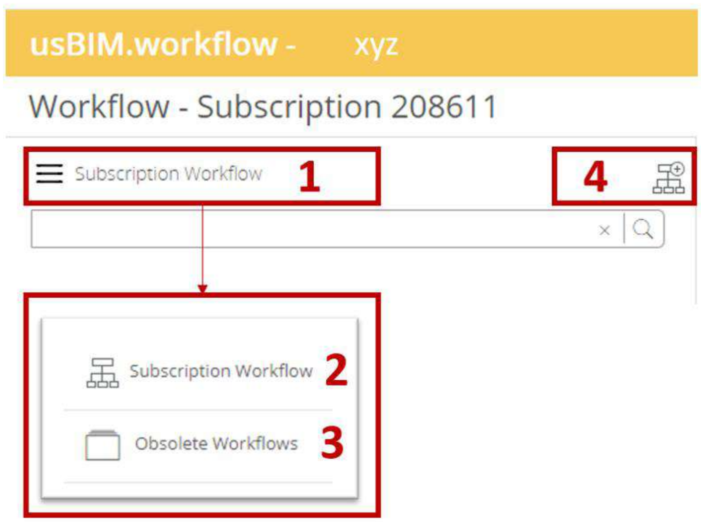

Figure *29.Subscription Workflow Section*

The subscription workflow section shown in Figure 29 is characterized by:

[1] Side menu

[2] Subscription Workflow: list of available subscription workflows

[3] Obsolete Workflows: it is possible to label as obsolete a workflow that is no longer intended to be used (it no longer appears in the list of "Subscription Workflows" but it is always possible to recover it). An obsolete workflow can no longer be run.

[4] Add Workflow: key for adding a new workflow.

If you want to create a new workflow subscription, through "Add Workflow" (number 4 Figure 29) the pop-up shown in Figure 30 appears showing two different ways to add a new workflow:

[1] Create an empty Workflow: a window with the data entry form for the new workflow opens up;

[2] Create a Workflow using an existing Workflow as a template: with this function, you can select and copy a previously structured workflow at project and subscription level. The copied workflow will be added to the list of available workflows.

Figure *30. Creating a new Subscription Workflow*

4.2.1 New Workflow

Selecting the "Create an empty Workflow" option, a data entry form is displayed. The data to be added is listed below:

- Name (mandatory)
- Description

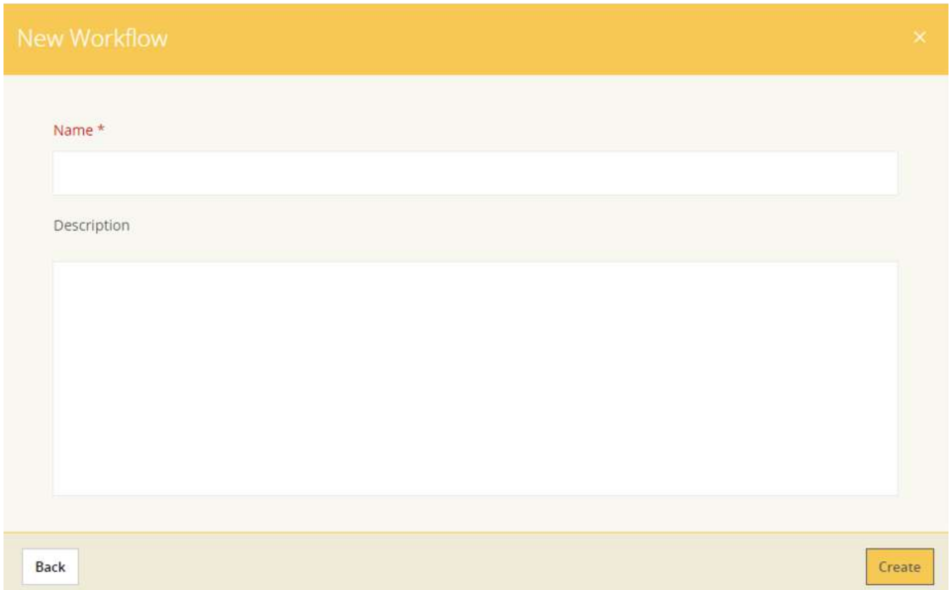

Figure *31. Data form*

A click on the Save button will open an area as in fig. Figure 32, where a new workflow can be structures.

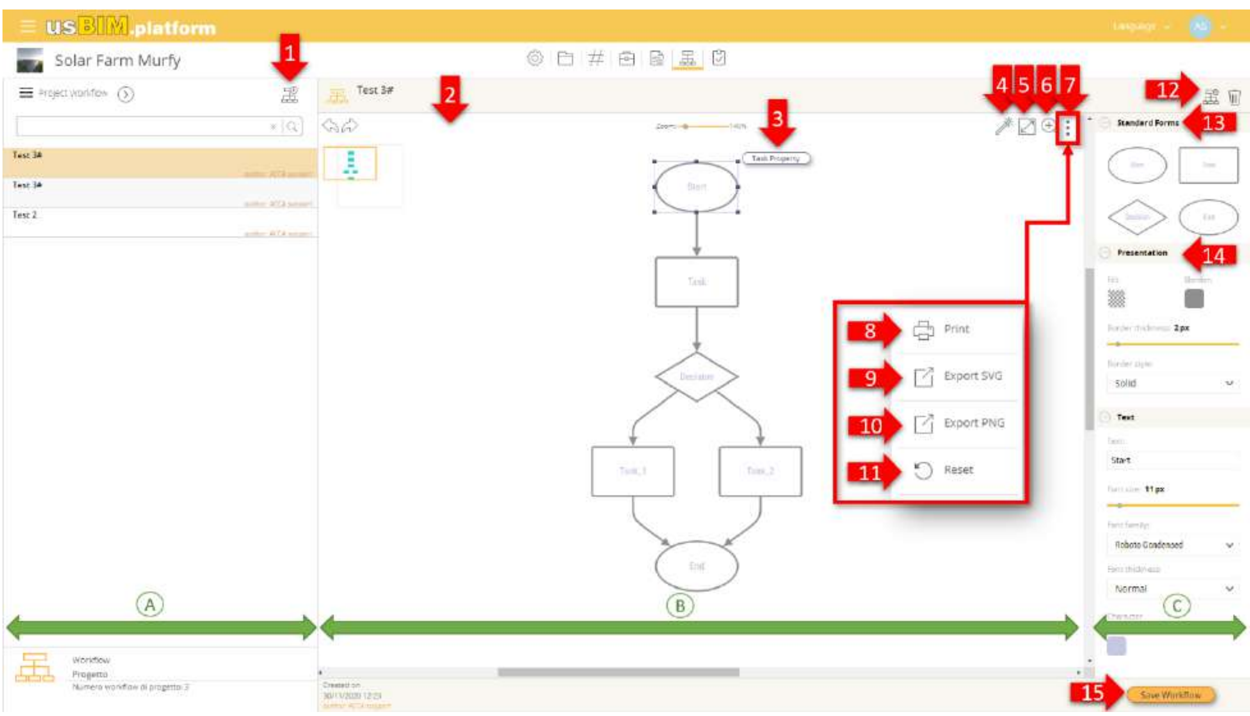

Figure *32. Workflow main window*

[A] Subscription workflow tree menu

[B] "WhiteBoard" for workflow design

[C] Panel for editing graphics properties of the workflow

[1] Back and Forward Button

[2] Workflow design area: within this screen it is possible to graphically structure the workflow

[3] Task properties: within this area you can edit information and add annotations

[4] Automatic Layout Chart

[5] Full Screen

[6] Zoom

[7] Menu

[8] Print: with this button you can print the structure of the workflow

[9] Export to SVG: with this button you can export the structure of the workflow in SVG format

[10] Export to PNG: with this button you can export the workflow structure to PNG format

[11] Reset: with this button it is possible to clean the board, deleting the workflow created

[3] Task properties: within this area you can edit information and add annotations

[13] Standard shapes: Elliptical (run workflow); Rectangular (basic task - one input and one output); Rhomboid (decision step - one input and two outputs); Elliptical (close the workflow)

[14] Workflow design area: within this screen it is possible to graphically structure the workflow

[15] Save Workflow

4.2.1.1 Creating the workflow

Access the form that contains the workspace for drawing the workflow. Here you are free can structure your workflow scheme: by choosing from the standard shapes and dragging them into the drawing area, you can build the new workflow. At the end of the workflow construction, click on the "Save Workflow" (button 15 Figure 32).

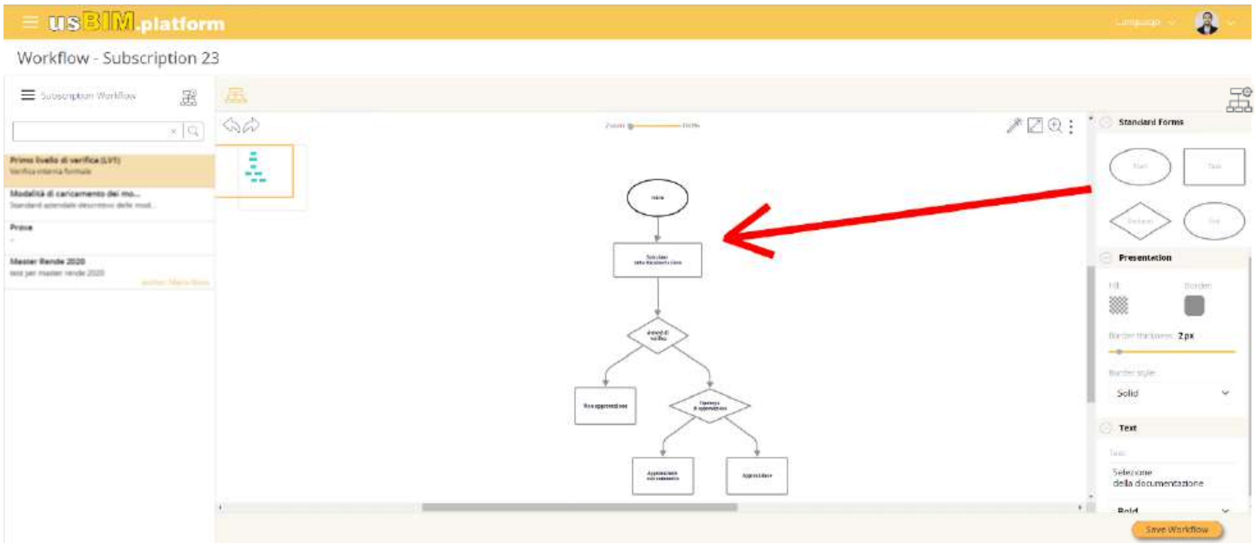

Figure *33. Building the New Workflow*

Four types of standard shapes are available:

- "Start" ellipse: task to run the workflow, marked by a single output;
- "Task" rectangle: simple task, marked by an entry and an exit;
- "Decision" Rhomboid: decision task, marked by an input and two outputs;
- "End" ellipse: task to close the workflow, marked by one or more inputs.

usBIM.workflow provides, as shown in Figure 34, the "Connection" option that connects one step to another.

Figure *34. Task options*

4.2.1.2 Workflow Properties

Once the workflow has been structured, it is possible to update its properties by clicking on the "WORKFLOW Properties" button as indicated in Figure 35.

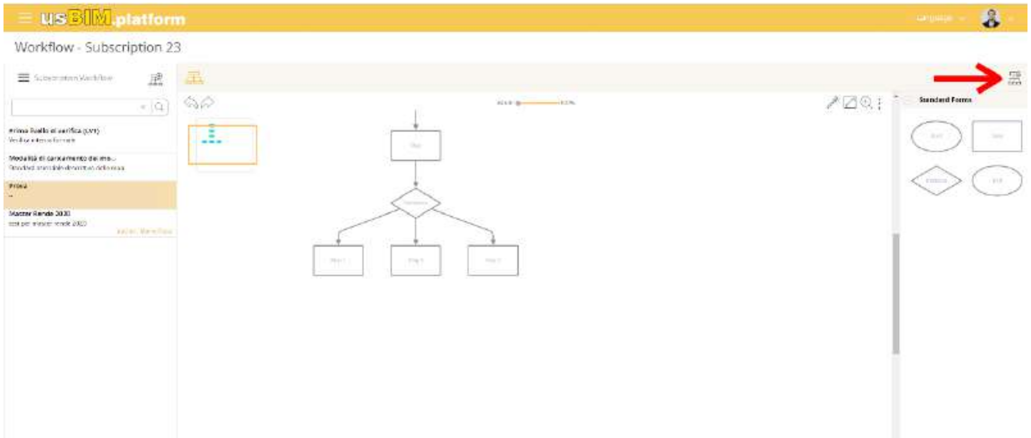

Figure *35. Workflow Properties*

A pop-up window opens up, where you can edit workflow information (arrow 1 Figure 36) or add annotations (arrow 2 Figure 36).

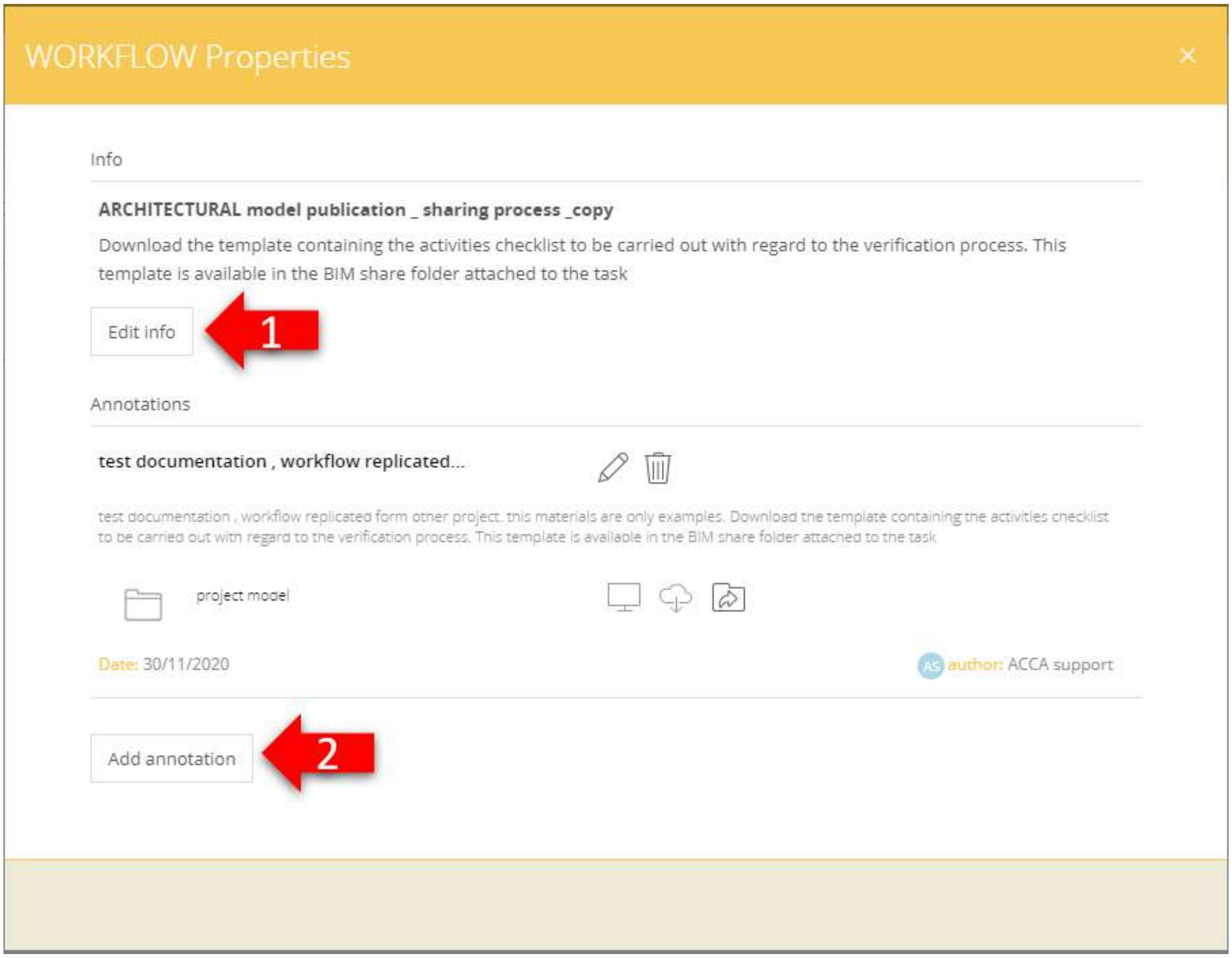

Figure *36. Edit Workflow Properties*

In particular, by clicking on the Edit Information button (arrow 1 Figure 36), you can rename the workflow, add a description or make it obsolete (Figure 37).

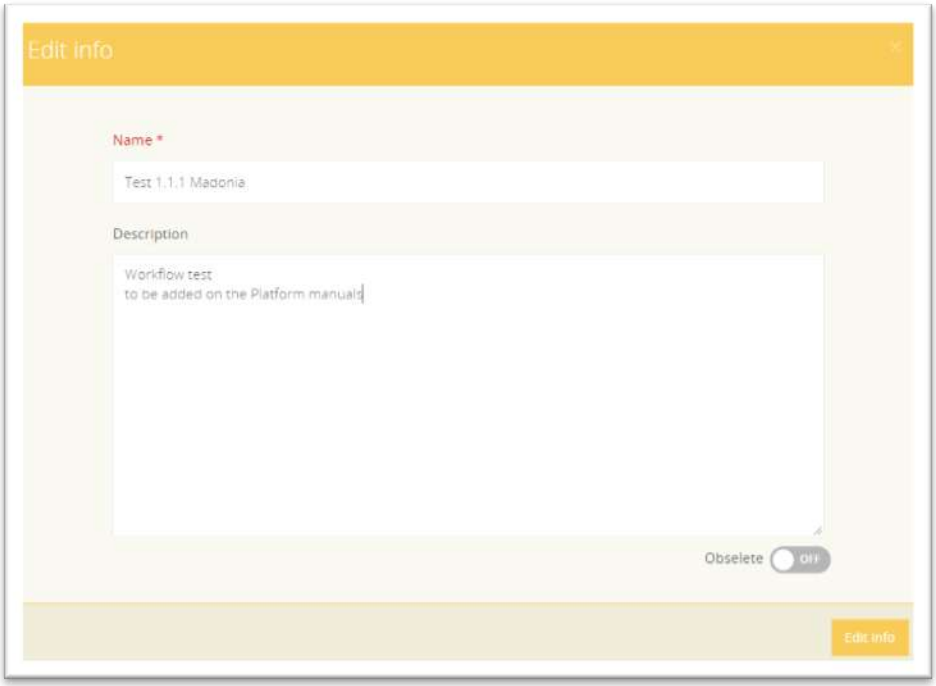

Figure *37. Workflow information editing*

By clicking on the Add Annotation button (arrow 2 Figure 36), you can structure an annotation and request confirmation that it has been executed. You can also attach:

- a folder in the BIM Share section;
- a file from the BIM Share section;
- a file from the device (Figure 38).

It is also possible to request confirmation of the execution of the annotation by ticking the "Request confirmation" box (Figure 38). Subscription workflow annotations will be visible by actors who will have permission on at least one task in this workflow.

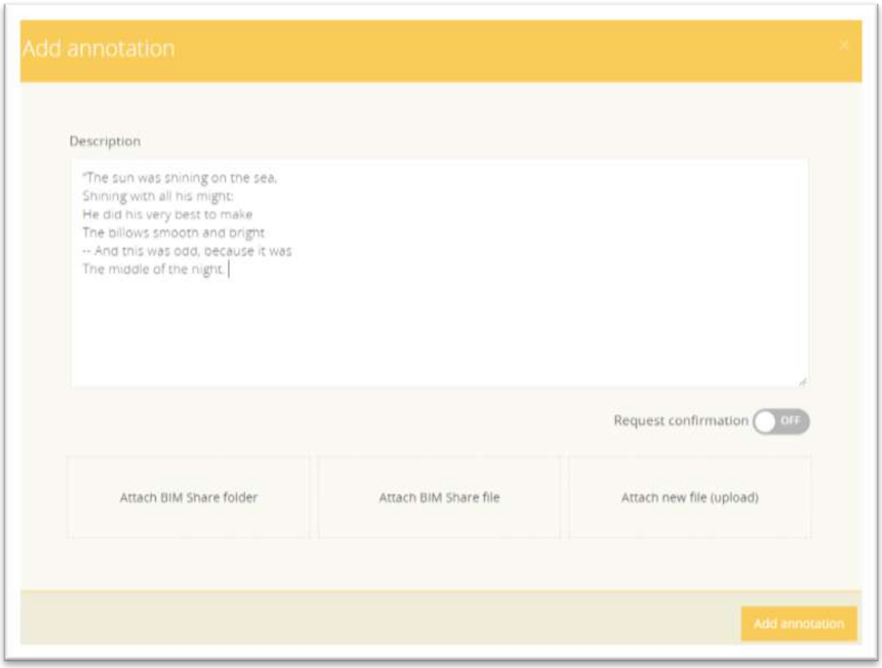

Figure *38. Add Annotation in Task Properties*

To characterize a task, select the shape in the schema and then click on the Task Property button as shown in Figure 39.

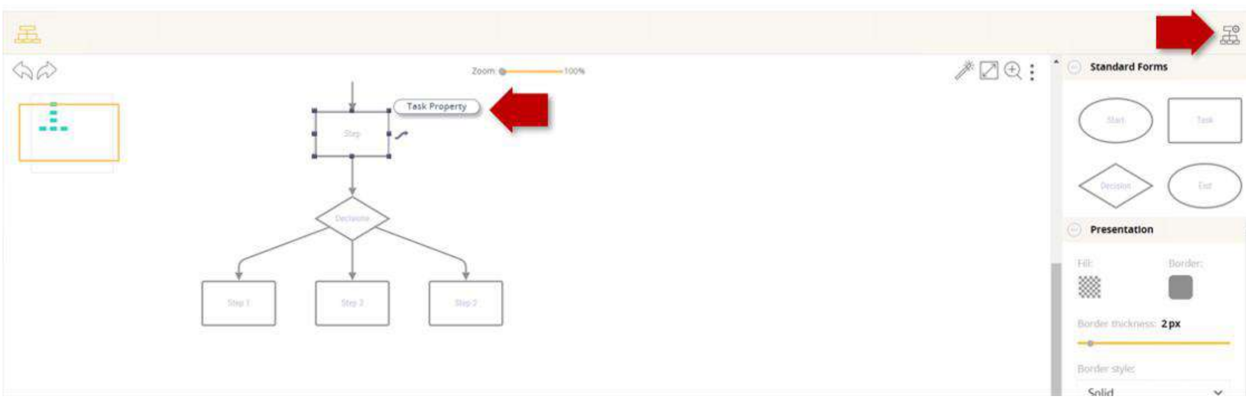

Figure *39. Property Screen*

The window shown in Figure 40 will open up.

In this environment it is possible to perform the same operations as in the Workflow Properties (see par. 4.2.1.2). However, these annotations will be visible, unlike the previous ones, only to users who will have a permission on this task.

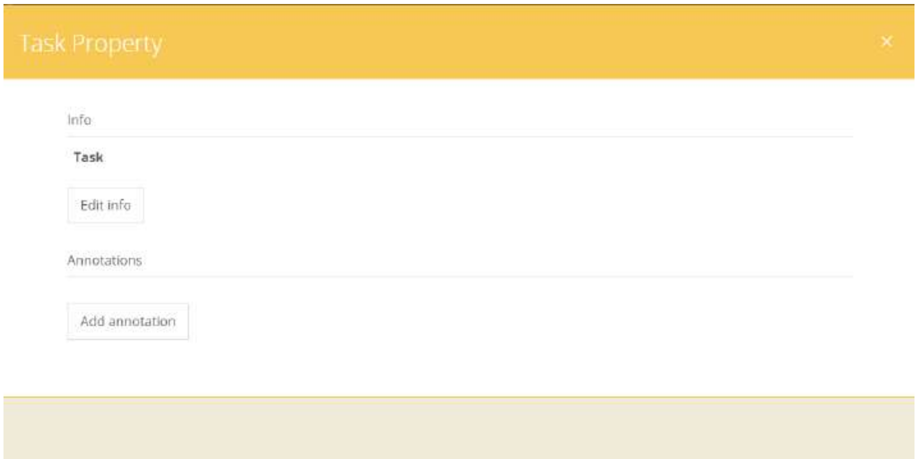

Figure *40. Task Property*

4.2.2 New workflow using an existing workflow as a template

Selecting the "Create a Workflow using an existing Workflow as a template" option, a window will appear, through which you can choose whether to use a project, subscription or system workflow as a template.

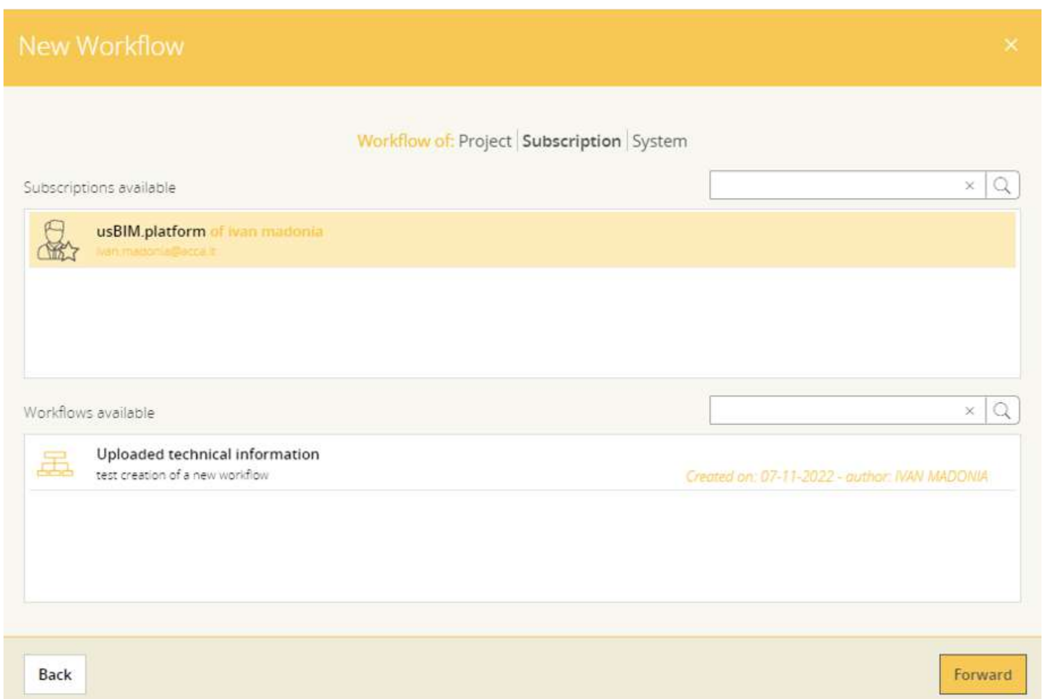

Figure *41. Selecting the Existing Workflow*

Clicking on the "Next" button will open a window with a form. The data to be added is listed below:

- Name (mandatory)
- Description

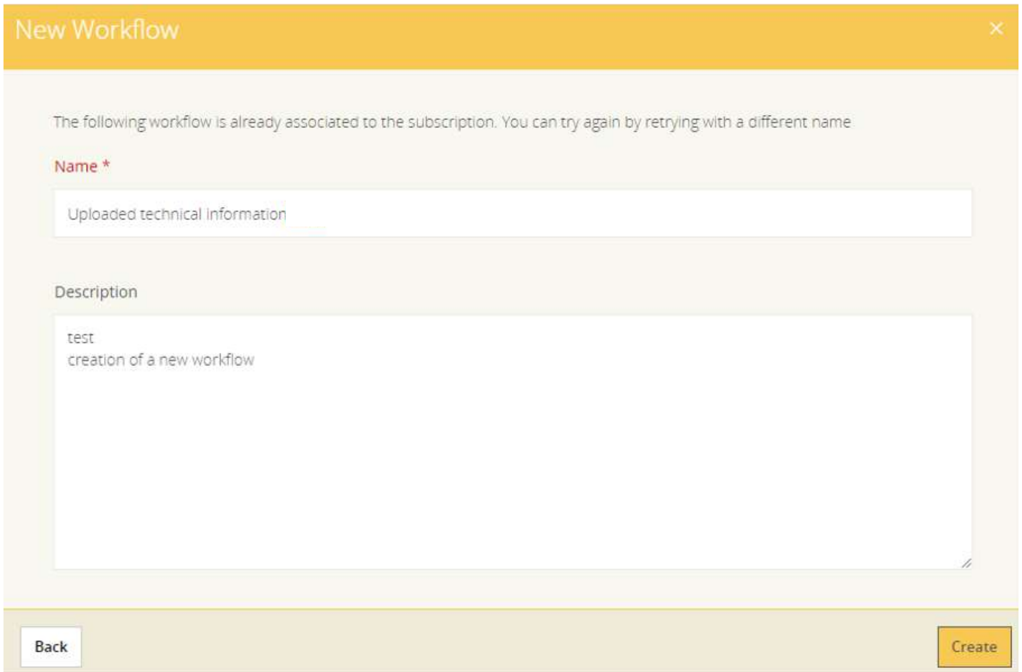

Figure *42. Data entry of the workflow used as a template*

Clicking on the "Create" button will open a screen like the one shown in Figure 32 allowing the building of the workflow, as shown in the paragraph 4.2.1.

5 usBIM.data

usBIM.data is a service integrated in usBIM.platform for BIM data management and for the creation of custom forms for entering and collecting significant data. The data collected and stored with the usBIM.data modules automatically integrates the informative content of any usBIM file and is always available with advanced search filters.

5.1 Level definitions

The usBIM.data templates are divided into two levels:

- **Subscription level**: here the templates are created by the Platform Admin or their delegates and can then be recalled and associated on all the projects created with the subscription;
- **Project level**: templates are created directly on a project.

Each workflow inherited from a subscription level or from another project can be used as a starting structure and can be customized according to the specific project requirements.

5.2 Subscription level

Accessing the application menu (arrow 1 Figure 43) we can find usBIM.data (arrow 2 Figure 43). Here you can create and manage subscription templates that can be inherited at the project level.

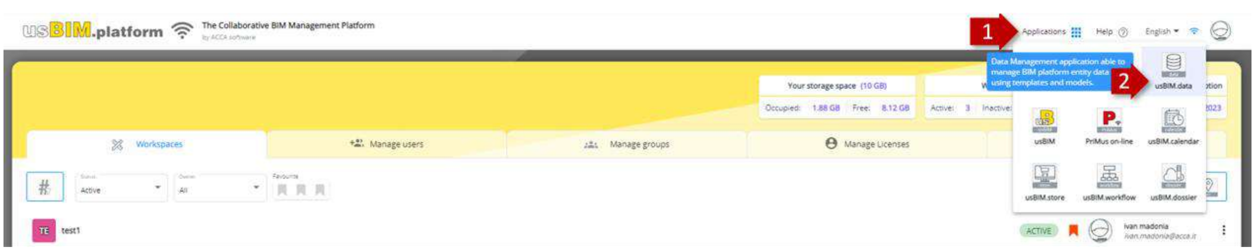

Figure *43. Applications Menu at Subscription Level*

In a new window, the list of templates already created can be viewed and filtered by Active, Inactive and Obsolete Status (arrow 1 Figure 44). You can sort them by modification date, creation date, or by name (arrow 2 Figure 44). You can even search for them (arrow 3 Figure 44).

Figure *44. usBIM.data home screen*

5.2.1 Adding data template: creating a new template

With the "Add data Template" button (arrow 4 Figure 44), instead, you can create a new template. At this point, users have a double option: creating a new model from scratch or creating a model from one previously edited (Figure 45).

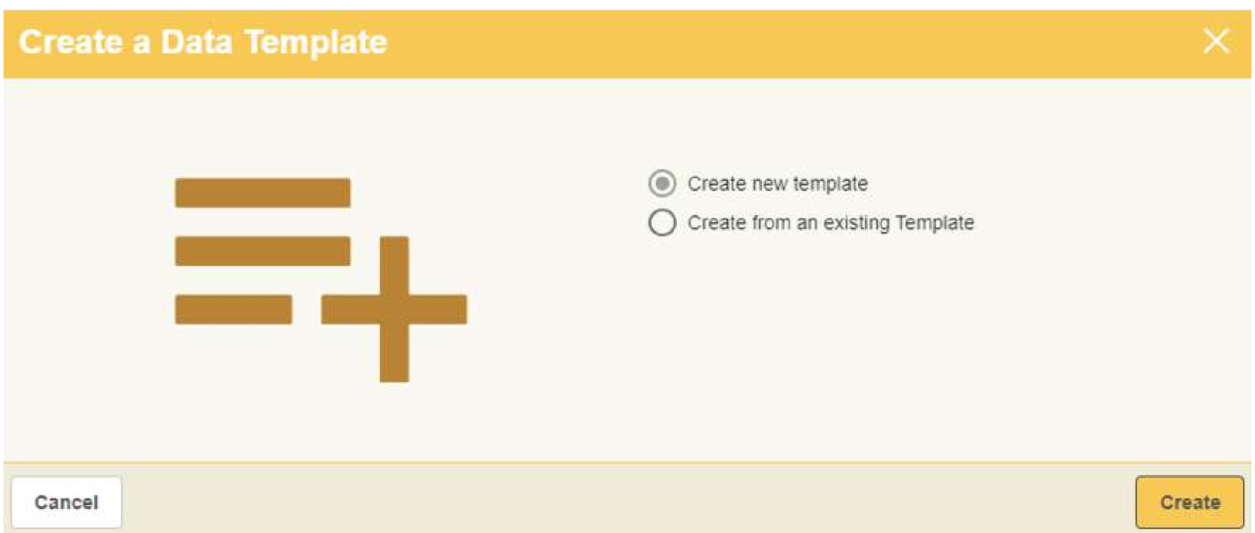

Figure *45. Creating a new template*

By choosing the first option, users will access a section to create a new template. In particular, this procedure is divided into the following three steps: "Create Data Model" (arrow 1Figure 46), "Data Template Composition" (arrow 2Figure 46) and "Preview" (arrow 3 Figure 46). The mandatory fields "Model name" (arrow 4 Figure 46) and "Model description" (arrow 5 Figure 46) cannot be left empty.

You can also specify whether the document can be edited at project level in its structure. By default, you have the possibility to modify it and, therefore, if necessary, set it to edit-mode, simply activate the corresponding toggle (arrow 6 Figure 46). This feature is used to define cross-project models, so that data can be searched for at subscription level.

Finally, you can choose whether data entry type will be single or multiple. In the first case, once the data entered is "blocked", it will no longer be editable and it will only be read-only in the data sheet. When the data entry is "multiple", multiple data entries can be added over time. Each entry can in turn be blocked and thus made exclusively searchable (arrow 7 Figure 46).

Figure *46. New template creation process*

5.2.2 Template Composition

To proceed with the template composition, click on the "Next" button. Now you can start building your structure by editing the TAB 1, added by default. Open the menu (arrow 1 Figure 47), click on "Change Name" (arrow 2 Figure 47), enter the name of the TAB and click on "Save" (arrow 3 Figure 47).

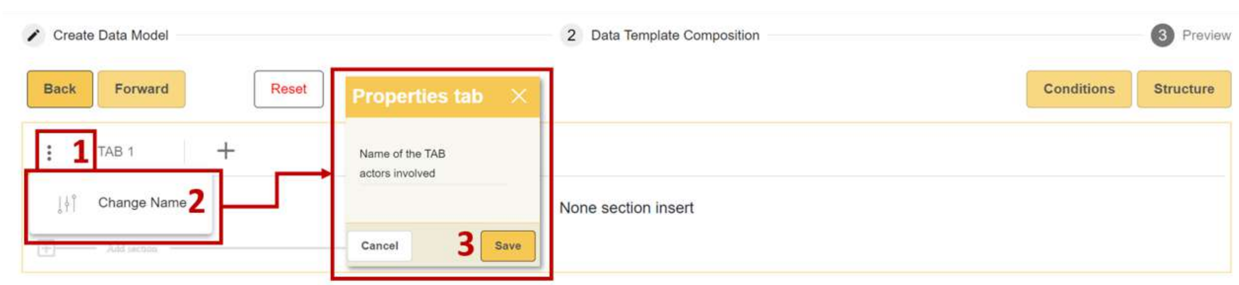

Figure *47. Properties TAB*

Click on "Add Section" (arrow 1 Figure 48) to access the menu that can be structured according to the needs. For example, you can indicate the number of columns (arrow 2 Figure 48), the composition, and any separation lines. Once completed, click on "Select" (arrow 3 Figure 48). At this point the section can be further customized by adding the "Name" (arrow 4 Figure 48), the "Font style" etc. To apply the choices made, click on "Save" (arrow 5 Figure 48).

Figure *48. New Section*

At this point you can indicate how to enter data within the section. You need to click on the "Add item" button (arrow 1 Figure 49) to access the contextual window where you need to select at least one field (e.g. data entry through Text, Check box or Date). Clicking on "Select" (arrow 2 Figure 49) activates an additional window where you need to add the "Field name" and indicate whether this is a required field (arrow 3 Figure 49). Once the changes have been completed, click on "Save" (arrow 4 Figure 49).

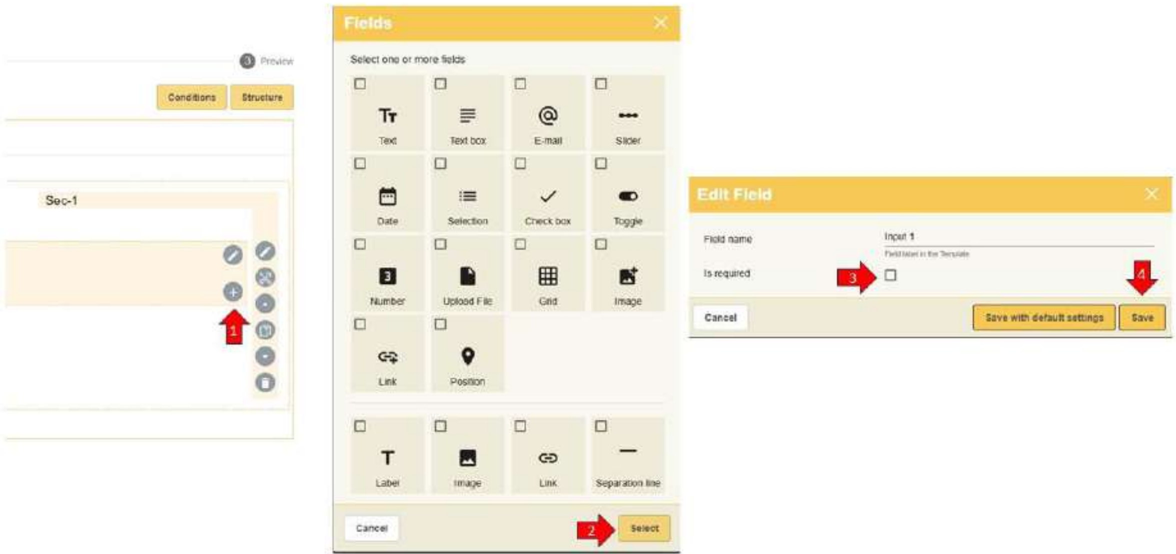

Figure *49. Data entry field choice*

These fields will automatically appear in the Tab section. You can always edit them or add new ones (arrow 1 Figure 50). In particular, by clicking on the contextual menu of each single field (arrow 2 Figure 50), it is possible to delete it, move it up or down with respect to other fields in the section, rename it (Edit parameters) and set any "Conditions" (arrow 3 Figure 50).

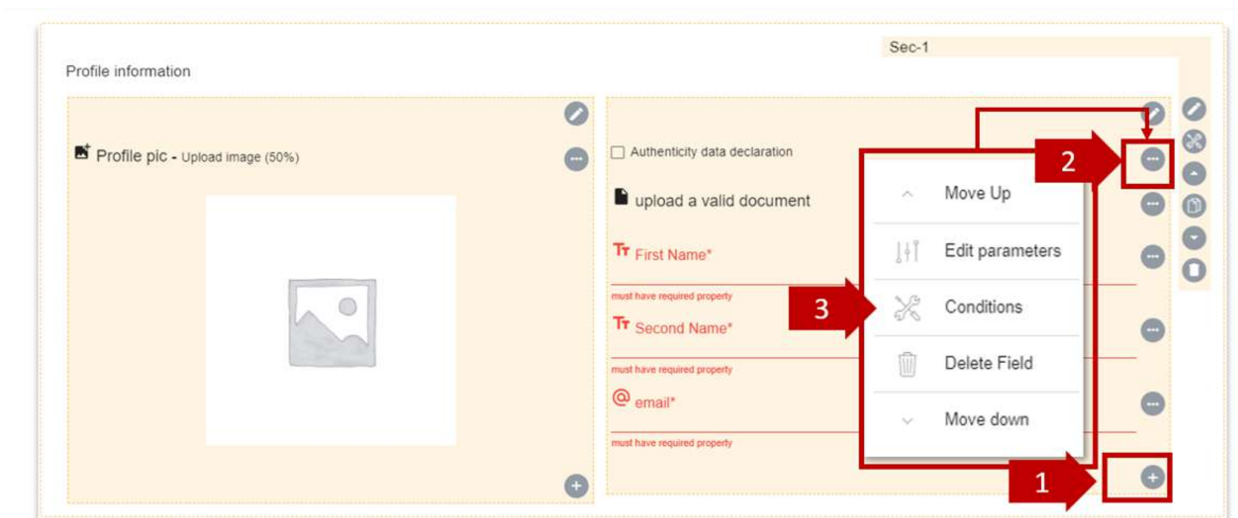

Figure *50. Possible actions on the data field*

5.2.3 Condition Setting

The latter option allows you to make that field accessible or not if and only if certain requirements are met. By clicking on "Conditions" (arrow 1Figure 51), you can choose:

- Show: the field is shown in the template only if the condition is met
- Hide: the field is hidden in the template only if the condition is met
- Enable: the field is always shown in the model but is only enabled if the condition is met
- Disable: the field is always shown in the template but is only disabled if the condition is met

Once the choice has been made (arrow 2 Figure 51), click on the "if" button (arrow 3 Figure 51).

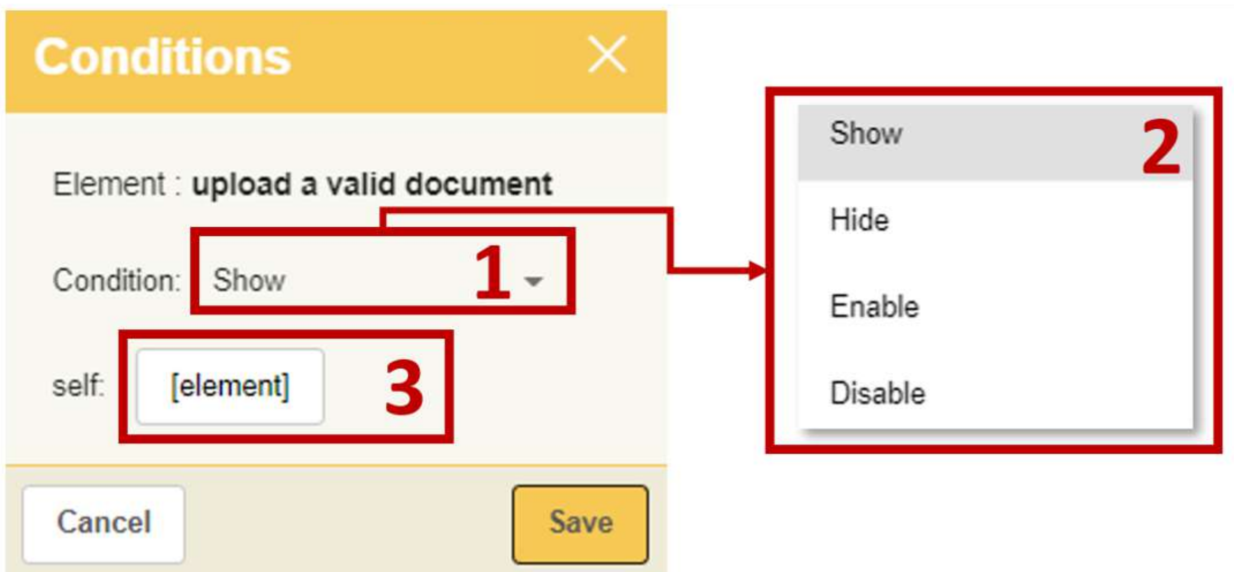

Figure *51. Model Conditions*

At this point you must choose the field of the model (arrow 1 Figure 52) whose True or False status (arrow 2 Figure 52) triggers the choice made previously (in the example shown, the *Document Name* field appears only if the *NDA is accepted*). Click on "Save" (arrow 3 Figure 52) to complete the operations.

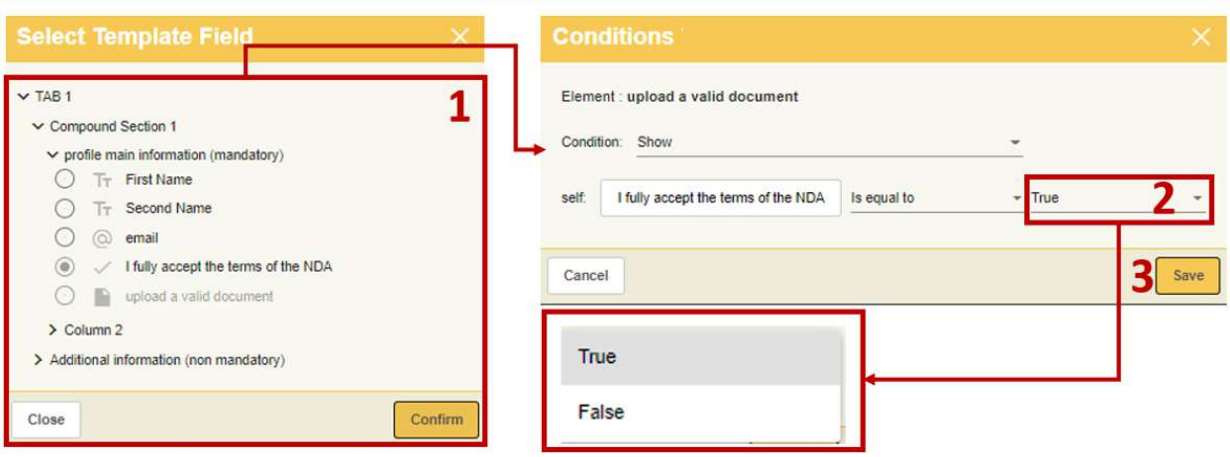

Figure *52. Condition Setting*

At the end of the setting of the conditions, an icon will appear at the relevant field whose *hint* suggests "Field visible under certain conditions" (Figure 53).

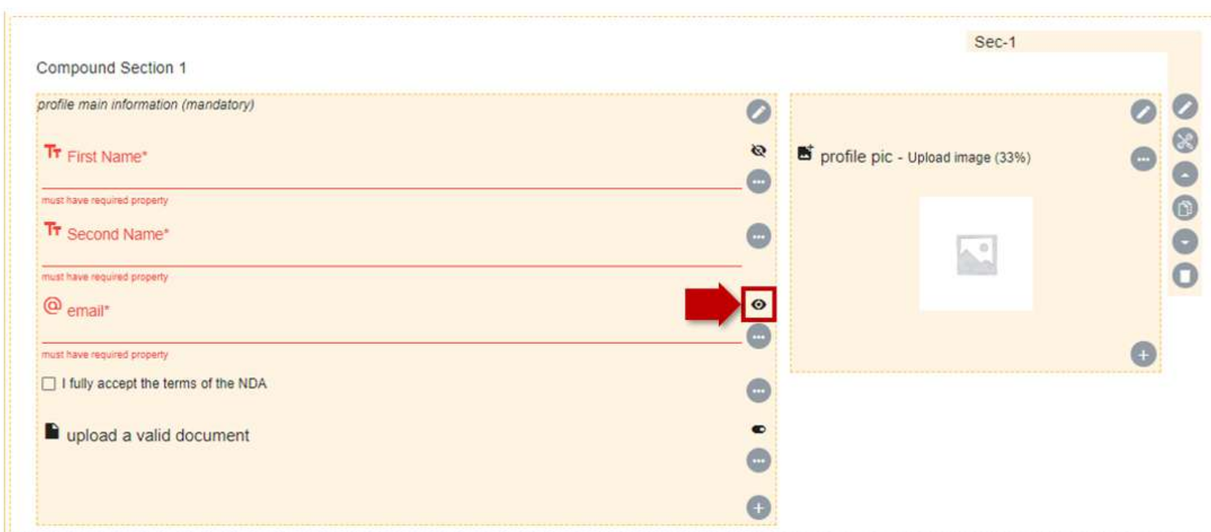

Figure *53. Field visible under certain conditions*

You can also set the conditions by clicking on the relevant button (arrow 1 Figure 54) on the main screen. In this case, click on Select Template field (arrow 2 Figure 54) and proceed as described above.

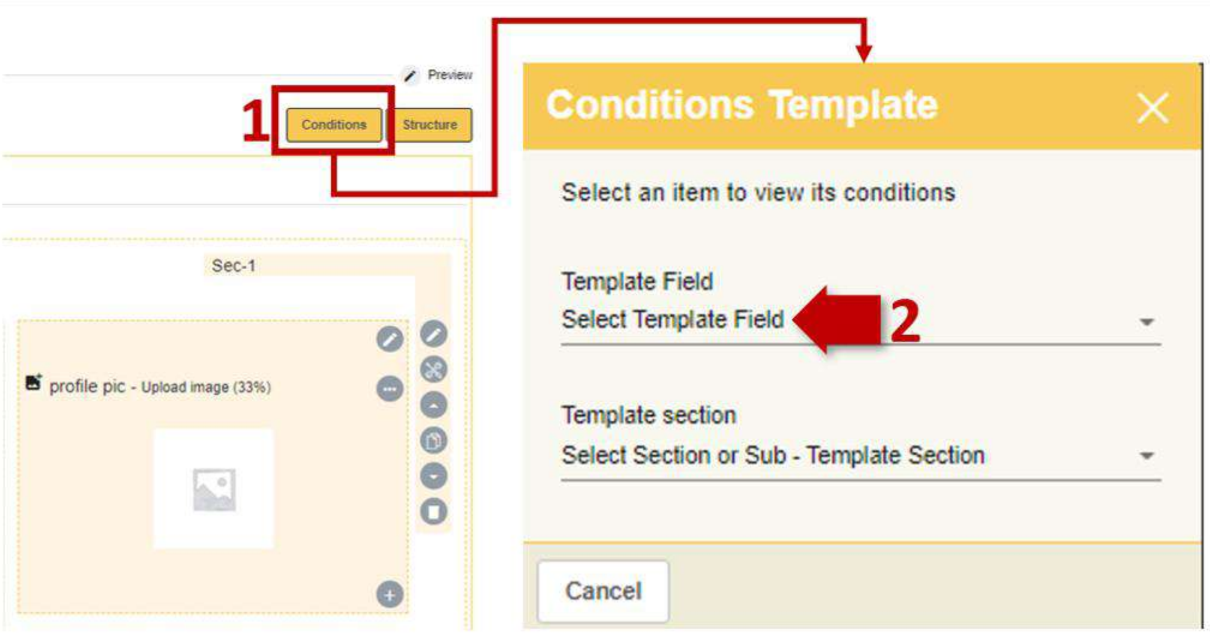

Figure *54. Model Conditions*

5.2.4 Structure

The button "Structure" (arrow 1 Figure 54) which allows you to navigate all the fields of the model in a tree structure (arrow 2 Figure 54) is at the right of the Conditions button.

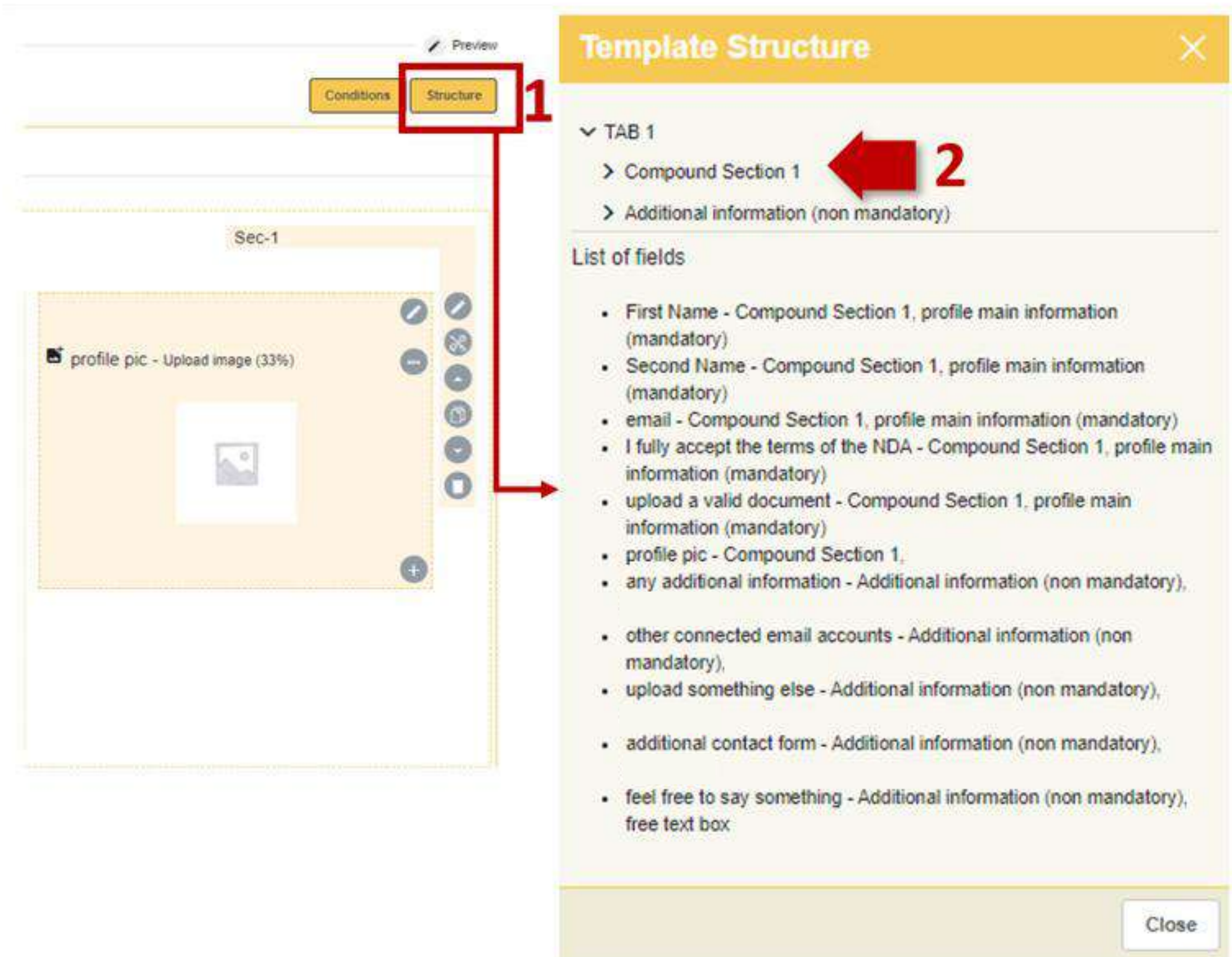

Figure *55. Model Structure*

5.2.5 Adding and editing tabs

Once you have finished structuring a TAB, you can add more by clicking on the "+" button (arrow 1) Figure 56. By default, the name "TAB 2" will appear. This can be changed by clicking on its contextual menu (arrow 2 Figure 56). Here, you also have the option to move or delete the entire TAB.

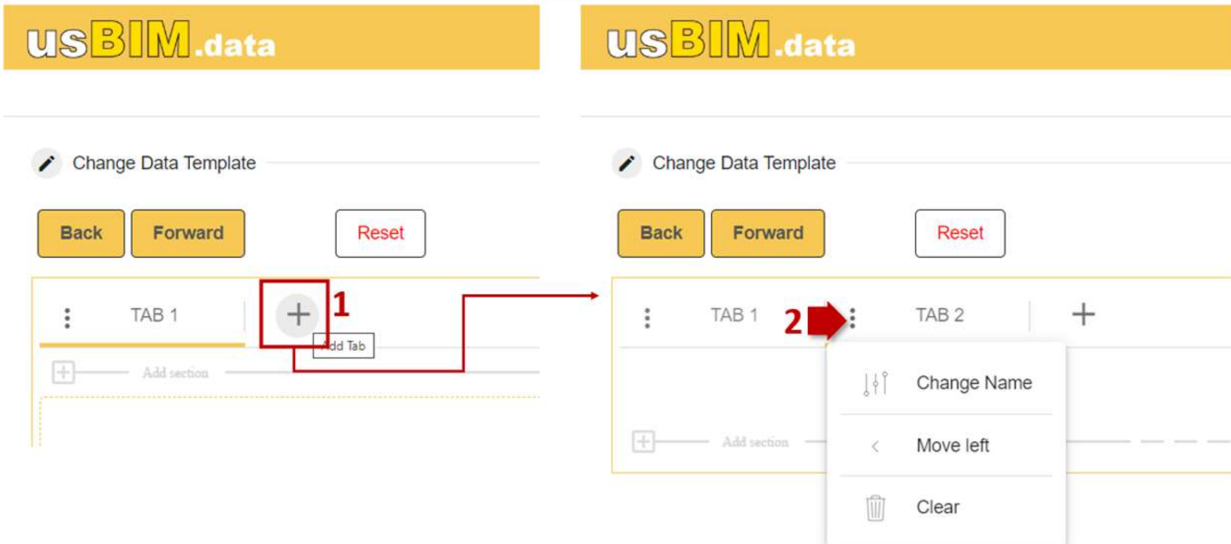

Figure *56. Add TAB*

If, on the other hand, you need to insert several TABS within a specific section, then you must proceed as follows. Click on the "Add Section" button (arrow 1 Figure 57), in the new window choose the "Multiple Section" option (arrow 2 Figure 57) and click on "Select" (arrow 3 Figure 57). Then give a name to the section (arrow 4 Figure 57) and proceed by clicking on "Save" (arrow 5 Figure 57).

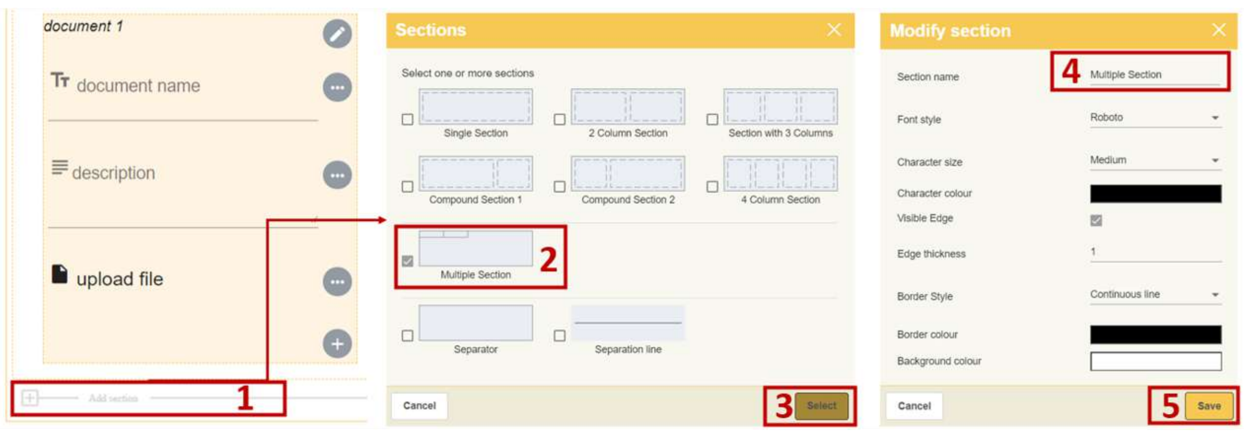

Figure *57. Multiple Section*

The platform shows a TAB called "SUB-TAB 1" which can be renamed as described above. It is also possible to add new ones by clicking on the "+" button (arrow 1 Figure 58). These are called SUB-TABs because they are included in a higher level TAB (see par. 5.2.2). For each TAB inserted (arrow 2 Figure *58*) sections need to be added as described above (see par. 5.2.11). Once these operations have been carried out, the text "Sub-Sec.-n" (arrow 3 Figure 58) will appear indicating the belonging of that section to a higher level section.

Figure *58. Sub-TAB and Sub-Section*

Below is an example of a "Multiple Section" inserted within a higher level TAB (Figure 59). Clicking on each SUB-TAB activates the relevant data entry sections.

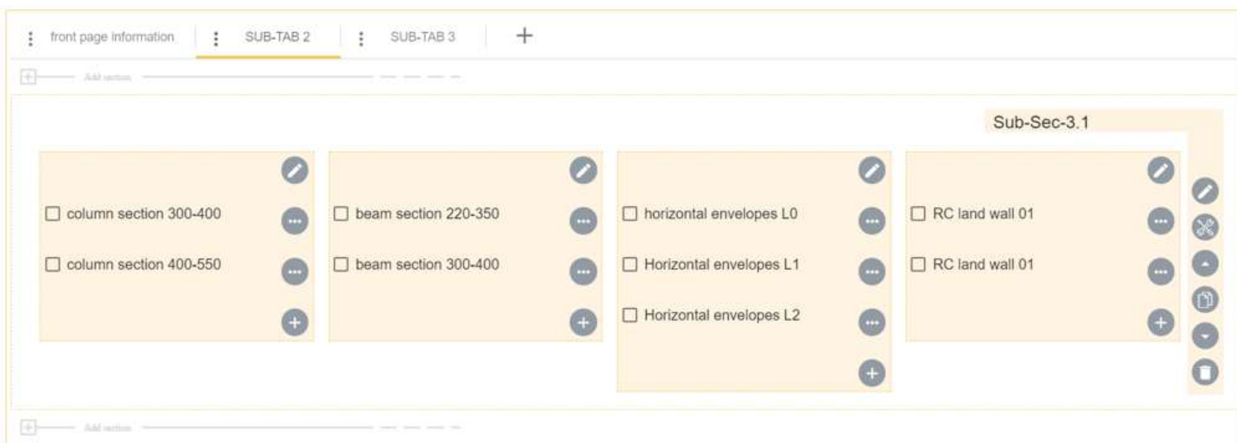

Figure *59. Multiple Section Example*

5.2.6 Section Menu

For each section and subsection, a menu (Figure 60) shows the following options:

1. **Edit Section**: you can change the section name and its style
2. **Section Condition**: you can set conditions to enable or disable the section
3. **Move Up and Move Down**: you can move the entire section over or under other sections

4. **Duplicate section**: you can duplicate the structure of the section and possibly change it later
5. **Clear section**: you can delete the entire section

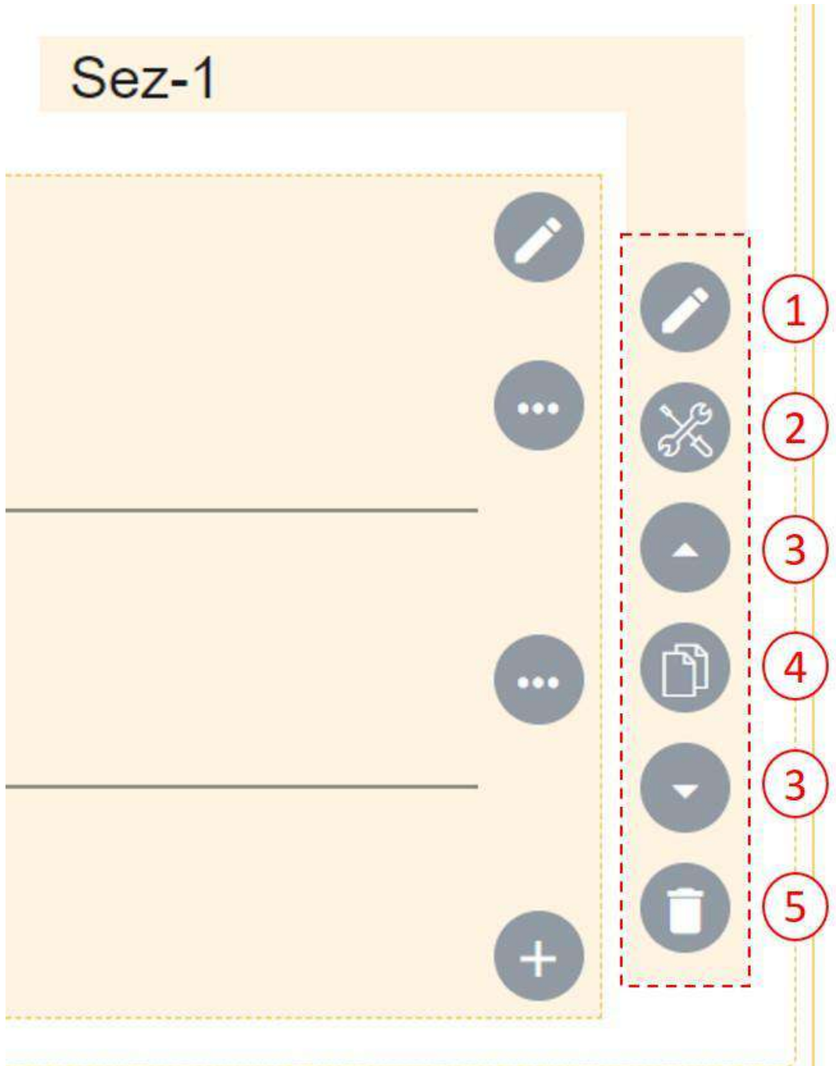

Figure *60. Section Menu*

5.2.7 Model Preview

Once you have finished structuring a model, or simply when you need to verify the validity of the choices made, click on the "Next" button (arrow 1 Figure 61) or on the "Preview" button (arrow 2 Figure 61).

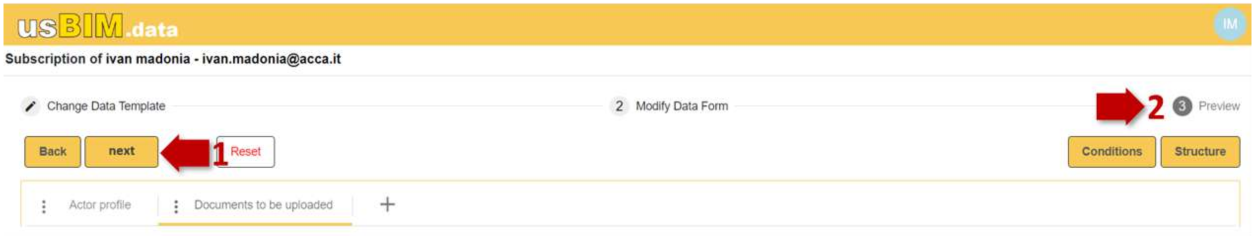

Figure *61. Model preview*

This is the preview page where, in addition to having an overview, you can run a simulation of the expected data entry and thus check that the prepared template is working as expected (arrow 1-2 Figure 62).

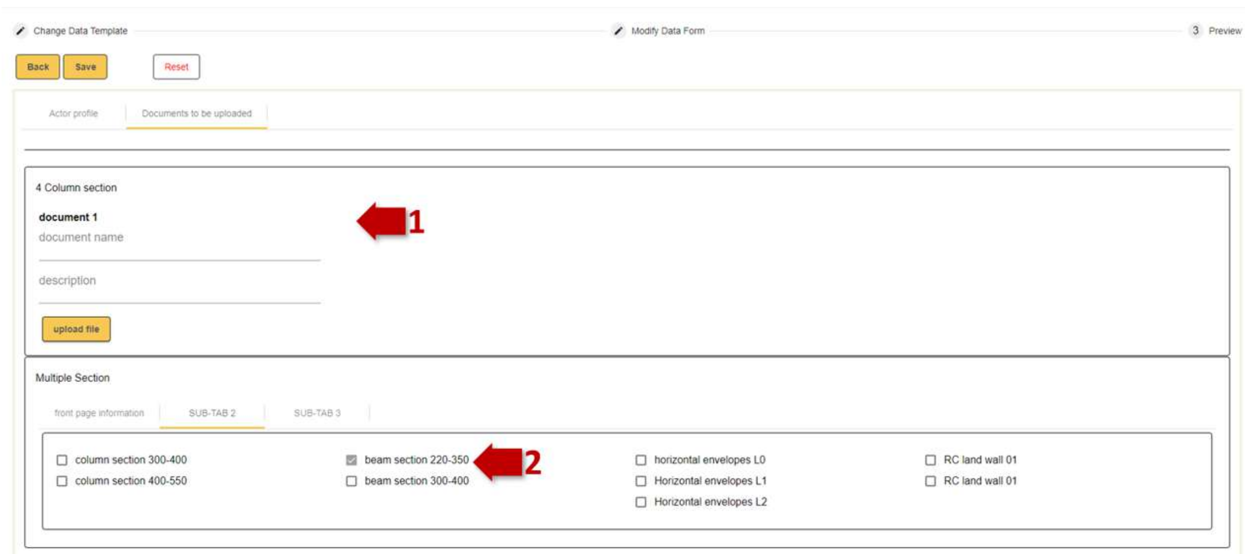

Figure *62. Preview check*

5.2.8 Save Template and Reset

Whenever you need to save the work done, click on the "Save" button (arrow 1 Figure 63) in the "Preview" section. In the new window, you can save the document as a draft (arrow 2 Figure 63), and then continue editing it. Alternatively, by clicking on "Activate" (arrow 3 Figure 63), the template will be saved permanently and made available for data entry.

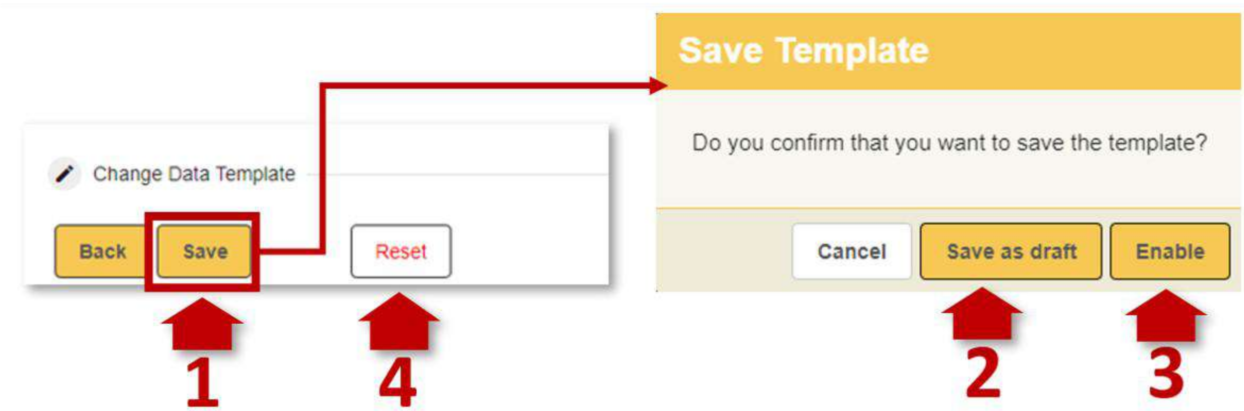

Figure *63. Saving and resetting the template*

If, on the other hand, you click on the "Reset" button (arrow 4 Figure 63), all the changes made since the latest save will be removed from the document. This means that if you are working on a new template and it has never been saved, the Reset button will clean up the template completely. If, on the other hand, it has been saved at least once even as a draft, Reset will delete all content implemented since the latest save.

5.2.9 Model status

Clicking on "Save as draft" or "activate" returns you to the usBIM.data home page. Here all models are shown and can be filtered as described in the paragraph 5.2. In particular, useful information is provided to identify the status of the template. In fact, a model can be associated with the yellow color for the "Draft" status (arrow 1 Figure 64), the green color for the "Active" status (arrow 2 Figure 64) and the red color for the "Obsolete" status (arrow 3 Figure 64). Remember that:

- DRAFT: the document is currently being processed and will not be available for data input until the status changes to Active
- ACTIVE: the document is consolidated and therefore available for data input
- OBSOLETE: the document is considered outdated or no longer valid and, therefore, is not available for data input

Clicking on the "Edit Status: DRAFT" button (arrow 4 Figure 64) an additional window will pop up where you can change the template status to ACTIVE (arrow 7 Figure 64). By clicking on the "Edit status: ACTIVE" button (arrow 5 Figure 64), the same window will pop up, this time allowing you to make the model OBSOLETE (arrow 8 Figure 64). Clicking on the "Change status: OBSOLETE" button (arrow 6 Figure 64) accesses a further window where you can make the model ACTIVE again (arrow 9 Figure 64).

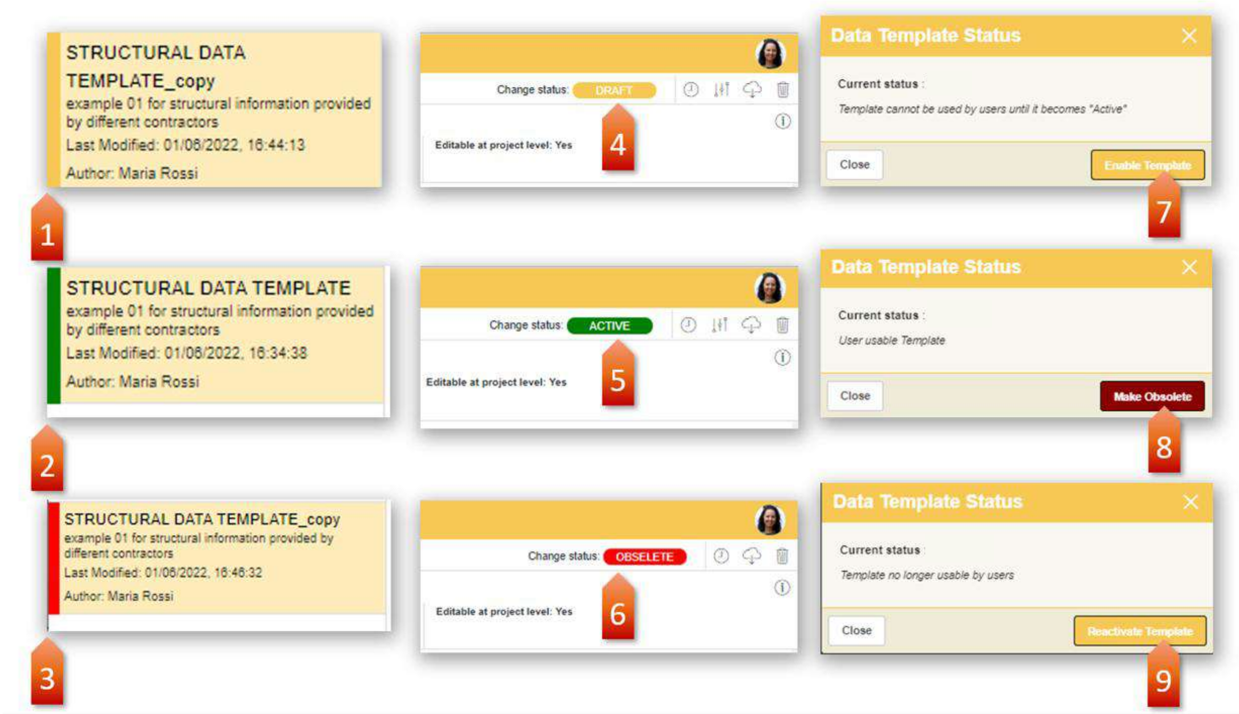

Figure *64. Document status*

5.2.10 Actions on the subscription model

Once a model is selected within the usBIM.data home screen, five icons (Figure 65) will allow you to:

- View version history (arrow 1 Figure 65)
- Edit the model (arrow 2 Figure 65)
- Download the template in .datajson format (arrow 3 Figure 65)
- Delete the model: deletion is only possible if the model has never been used (arrow 4 Figure 65)
- Read the model description (arrow 5 Figure 65)

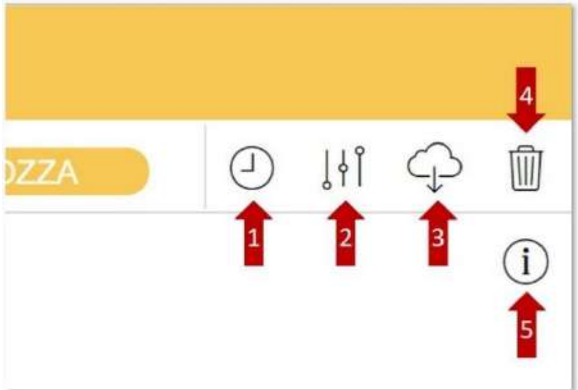

Figure *65. Action on the subscription template*

5.2.11 Create Data Template: Create from an existing template

You can create a new data entry template from an existing template. In this case, after clicking on "Create Data Template" (arrow 4Figure 44), you must select the item "Create from an existing model" (Figure 66).

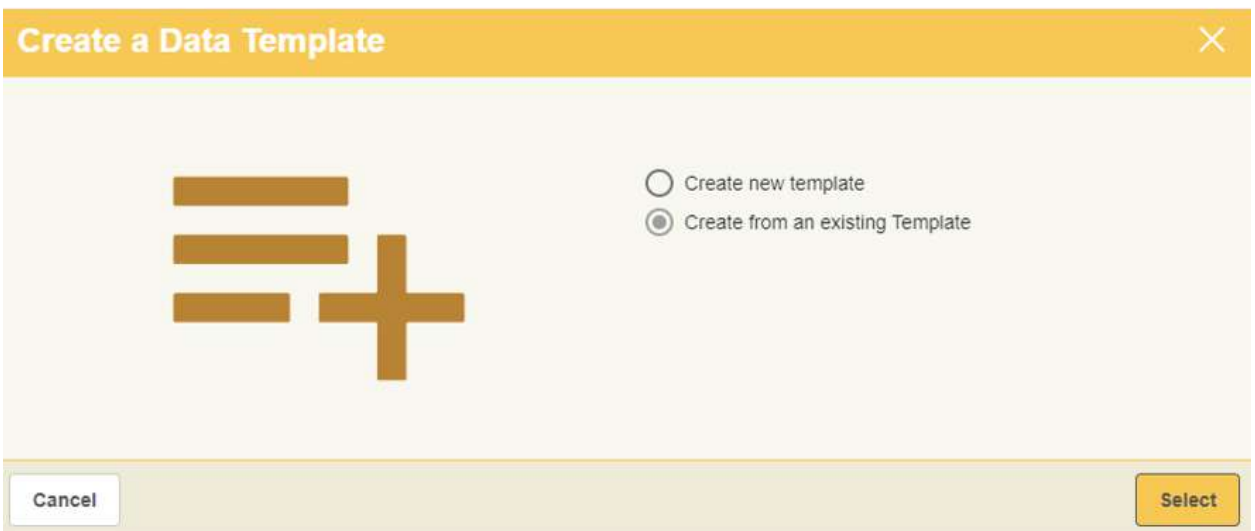

Figure *66. Create from an existing template*

At this point, two options are possible:

- **Templates from subscription**: here you can duplicate a template from your subscription or from a subscription you have access to. (arrow 1 Figure 67)
- **Templates from projects**: here you can duplicate a template created in either your own project or what you have access to (arrow 2 Figure 67)

In both cases you must select the template (arrow 3Figure 67), after choosing the subscription or the project, and click on "Select" (arrow 4 Figure 67). Once this is done, you can access the Data Template Creation screen from which you can modify and customize the inherited model, following the procedure described in the previous paragraphs (see par. 5.2.1). By default, the duplicated template file name has the suffix "_copy", which can be changed later as needed.

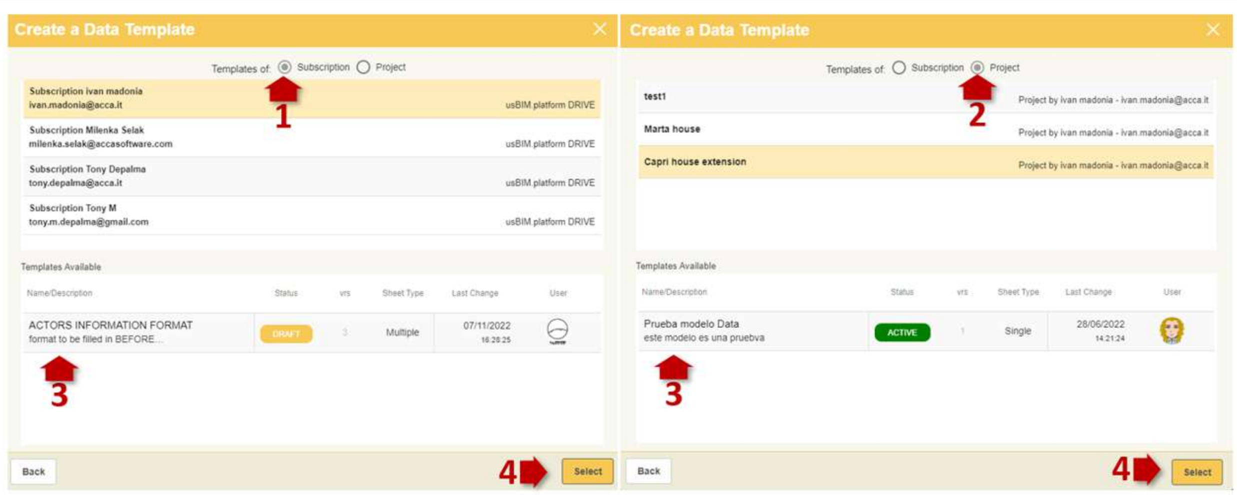

Figure *67. Choice of the existing template*

5.2.12 Permissions for creating a subscription template

The Platform Admin and the Platform Admin Delegate can create and manage the usBIM.data templates at subscription level, without any restriction. In particular, they can create a new model from scratch (see par.5.2.1), they can pick a model present on their subscription or on the subscription where they are Platform Admin (see par.5.2.11), or they can pick a model from a project. In the latter case, a PA or PA Delegate can also pick a project template from projects where they are identified as BIM Managers or Standard Users.

5.3 Project Level

You can also create a data entry template directly at a project level. In this case, the new tab will be available exclusively within the individual project (unless it is chosen as a template on other projects) that can be chosen and opened from the Workspaces tab. Once opened the project, click on the "Manage workspaces" button, right side of the page (arrow 1 Figure 68), and then click on the "usBIM.data" icon (arrow 2 Figure 68).

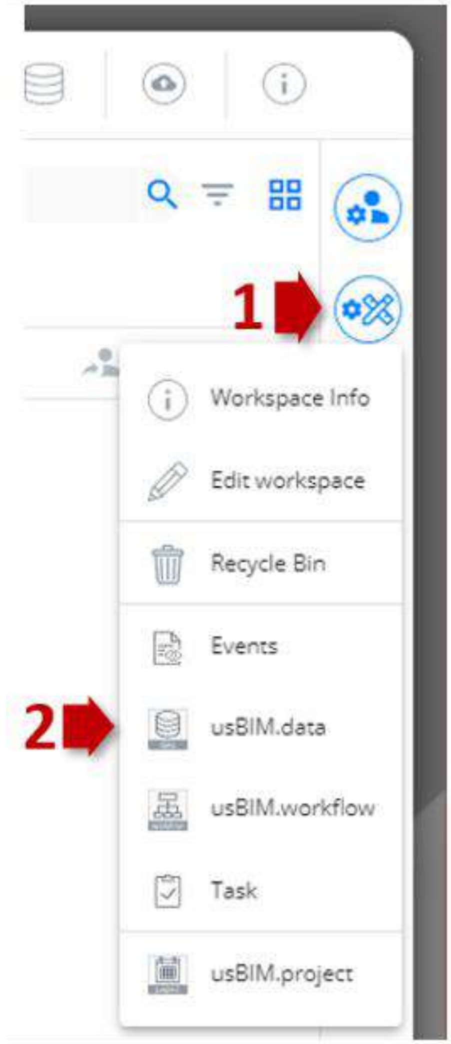

Figure *68. New Template from Project*

In a new usBIM.data window, the list of templates already created can be viewed and filtered by Active, Inactive and Obsolete Status (arrow 1 Figure 69, Figure 44). You can sort them by modification date, creation date, or by name (arrow 2Figure 69). You can even search for them (arrow 3Figure 69).

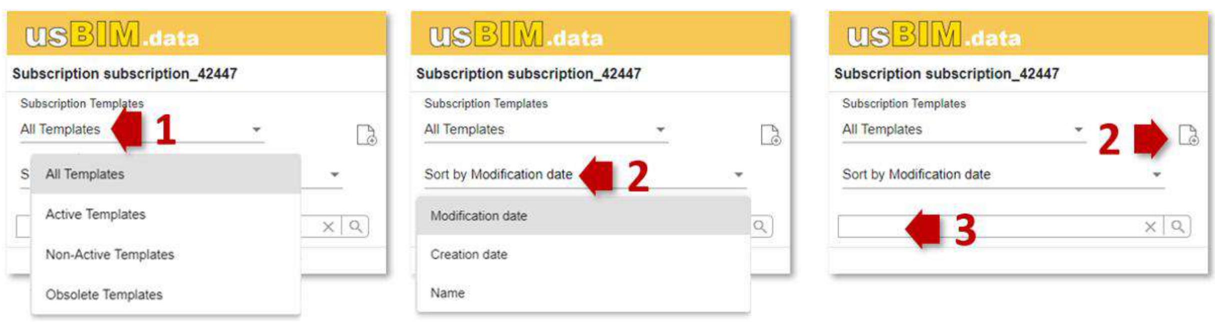

Figure *69. usBIM.data home screen*

5.3.1 Add Data Template

With the "Add data Template" button (arrow 4 Figure 69), instead, you can create a new template. At this point you can proceed as described in the previous paragraphs to create a model from scratch (see par. 5.2.1) or to create a model from an existing one (see par. 5.2.11).

Once a template has been added and made active at project level, it can be used by all those users who can access the project as described in paragraphs 5.4.1 and 5.4.3.

5.3.2 Permissions for creating a subscription template

The Platform Admin and the Platform Admin Delegate can create and manage the usBIM.data models at subscription level, without any restriction. In particular, they can create a new model from scratch (see par.5.2.1), they can pick a model present on their subscription or on the subscription where they are Platform Admin (see par.5.2.11), or they can pick a model from a project. In the latter case, a PA or PA Delegate can also pick a project template from projects where they are identified as BIM Managers or Standard Users.

5.4 Possible uses of a model

In usBIM.data, we first proceed to define a data template at subscription or project level; once created, this model can be

1. associated with documents in the CDE
2. associated with a 3D model (or its objects)
3. used as a stand-alone data entry file

5.4.1 Associating and usBIM.data tab to a CDE document

In order to associate an usBIM,data template with a shared document in the CDE, proceed as described below.

First, select the document to associate the model with (arrow 1 Figure 70), then select the "usBIM.data" TAB at the top, on the right side of the service (arrow 2 Figure 70). At this point, click on the "+" (Add Templates) button at the bottom right (arrow 3 Figure 70).

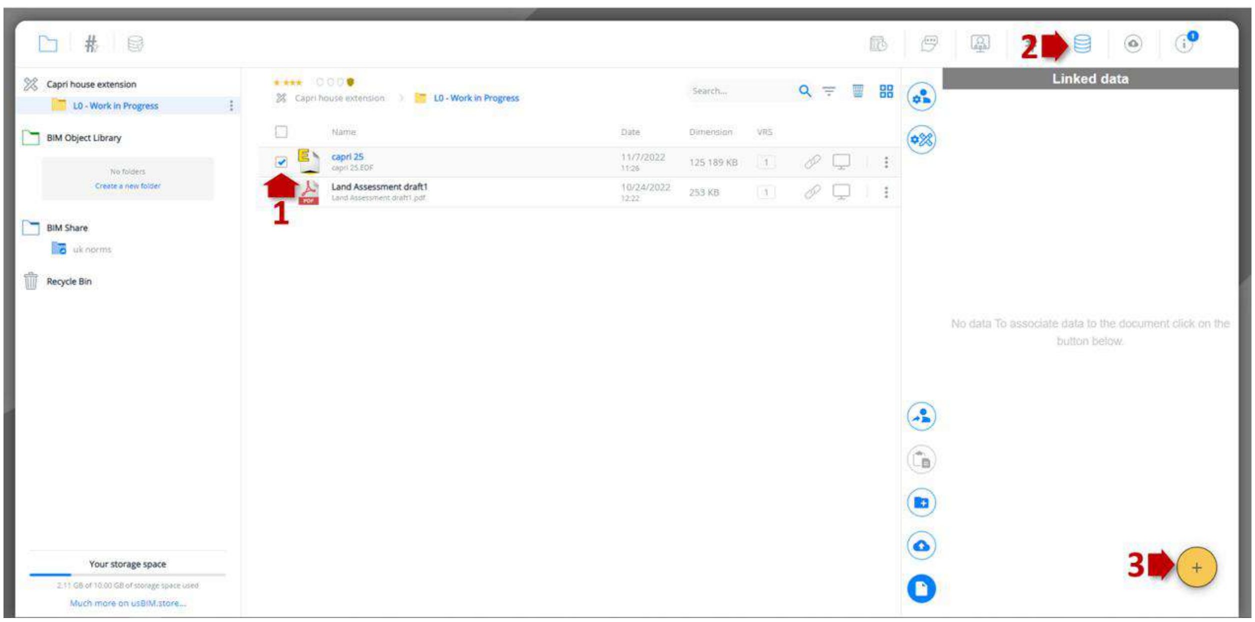

Figure *70. Associating a data template with a document*

In a new window, the project templates that you can associate with the selected document will be shown. The following details are provided:

- **Name and description** of the data model
- Model **version**
- **Sheet type** (if single or multiple submission)

- **Last Modified** (Date and Time)
- **User** (who made that template Active)

You must choose the data template (arrow 1 Figure 71) and click on the "Confirm" button (arrow 2 Figure 71). You can also make a multiple selection of sheets to associate with the document.

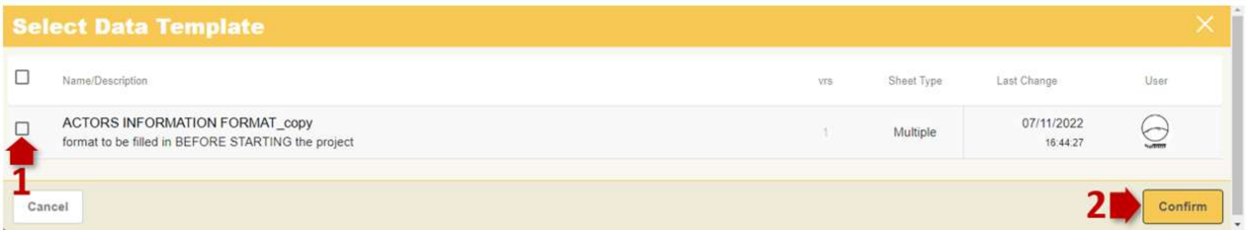

Figure *71. Model selection*

5.4.1.1 Linked data

After this operation, the template will appear in the "Linked data" section (arrow 2 Figure 70). One of the following colours (arrow 1 Figure 72) is assigned to each template:

- **GREEN**: **EDITABLE** document
- **YELLOW**: **LOCKED** document
- **RED**: **TO BE COMPLETED** document

When you need to view or fill in a form, click on the "Edit data" icon (arrow 2 Figure 72). To delete the template, click on the "Delete data" button (arrow 3 Figure 72). But if the document has already been edited and subsequently blocked, to avoid new data entries, then the "Edit data" icon only appears for read-only mode (arrow 2 Figure 72).

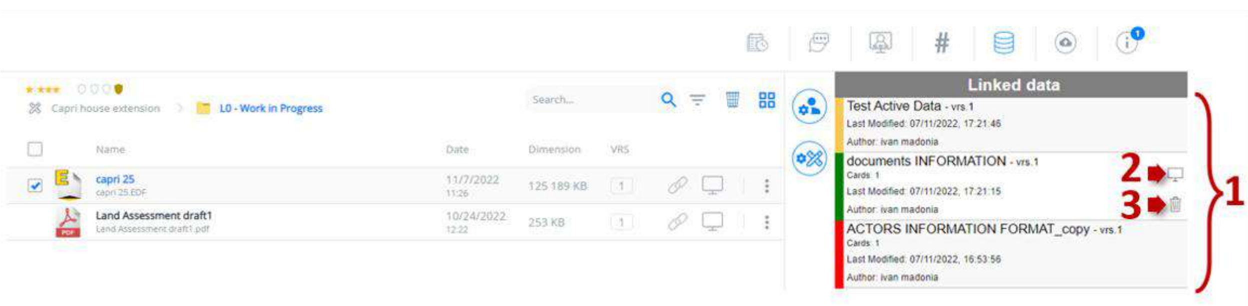

Figure *72. Linked data*

Filling out and saving a form

When a form is opened, there are two options:

1. The data entry type is single and thus immediately editable (arrow 1 Figure 73)

2. The data entry is multiple, so, in order for it to be edited, it is necessary to click on the "+" (Add) button for each submission (arrow 2 Figure 73).

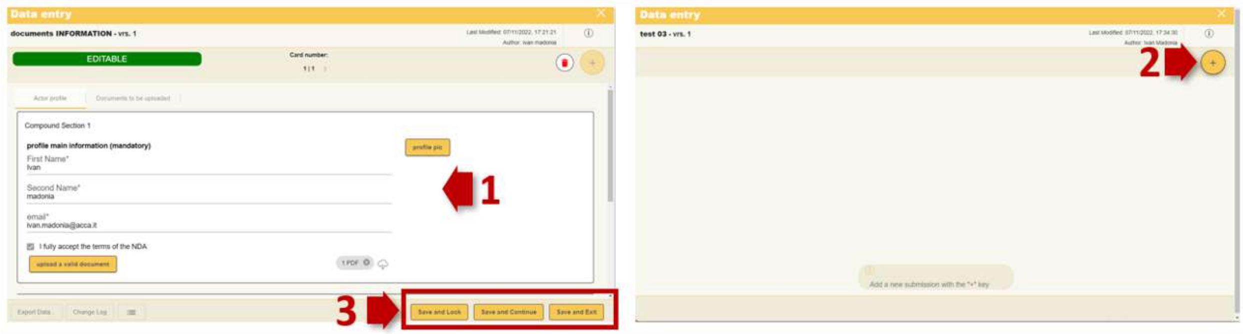

Figure *73. Data input*

In both cases, three saving options will be activated for the changes applied to the model used (arrow 3 Figure 73):

1. **Save and Lock**: the data entered is saved and the card is locked, which will then be read-only
2. **Save and Continue**: the data entered is saved and you have the possibility to continue working on the tab
3. **Save and Exit**: the data entered is saved and the tab is closed

If you choose the "Save and Lock" option, a message appears requesting confirmation of the operation (Figure 74):

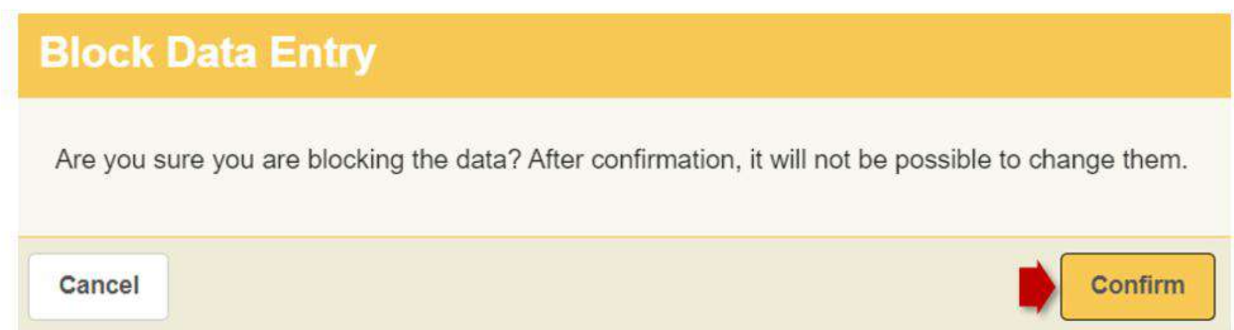

Figure *74. Lock Data Entry*

When you open a data entry tab, two or three icons appear at the bottom left, depending on whether the data entry is single or multiple (arrow 1 Figure 75):

- **Export Data**: all data entered in the tab is exported in .XLSX, .CSV, and .Geojson format .eliminaeliminaelimina
- **See Change Log**: a list of the versions of the changes made to the tab appears. Selecting a version (arrow 2 Figure 75) activates the "Details" button (arrow 3 Figure 75) which returns to the status of the template when that version was saved.

- **List of tabs**: the list of filled and saved tabs appears. This option is enabled only in the case of a multiple date entry template. Also in this case, once the tab has been selected from the list, the "Details" button is activated that shows information on the date and author of the changes (arrow 4 Figure 75).

Figure *75. Change log and tabs lists*

5.4.1.2 Actions on the project template

Once a template is selected within the usBIM.data home screen, five icons (Figure 76) appear that allow you to:

- View template usage, name, version and status (editable, to be filled in and locked). (arrow 1 Figure 76)

Please note: This key appears only if the usBIM.data model has been added in a service e.g. usBIM.platform, usBIM.browser.

- View version history (arrow 2 Figure 76)
- Modify the template (arrow 3 Figure 76)
- Searching for data (arrow 4 Figure 76)
- Download the template in .datajson format (arrow 5)
- Delete the template: deletion is only possible if it has never been used (arrow 6 Figure 76)
- Read the description of the template (arrow 7 Figure 76)

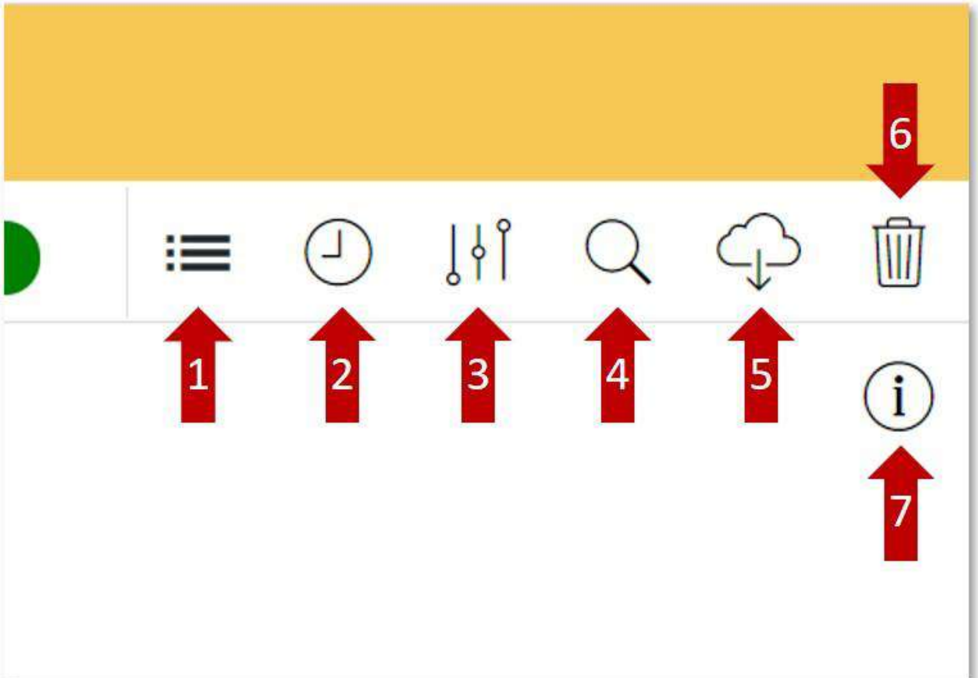

Figure *76. Actions on the project template*

In particular, the "Use" section (arrow 1 Figure 77) allows you to have an overview of the use of the model within the platform. It contains information about the application in which it was used (e.g. usBIM.platform, usBIM.browser), the status (e.g. editable), the version and the last modification.

In addition, the "Go to document" button (arrow 1 Figure *77*), redirects either to the folder containing the document to which the template is associated or to the document, opened with usBIM.browser, with which the template has been associated. By clicking on the "View template" button (arrow 2 Figure *77*) the template can be viewed.

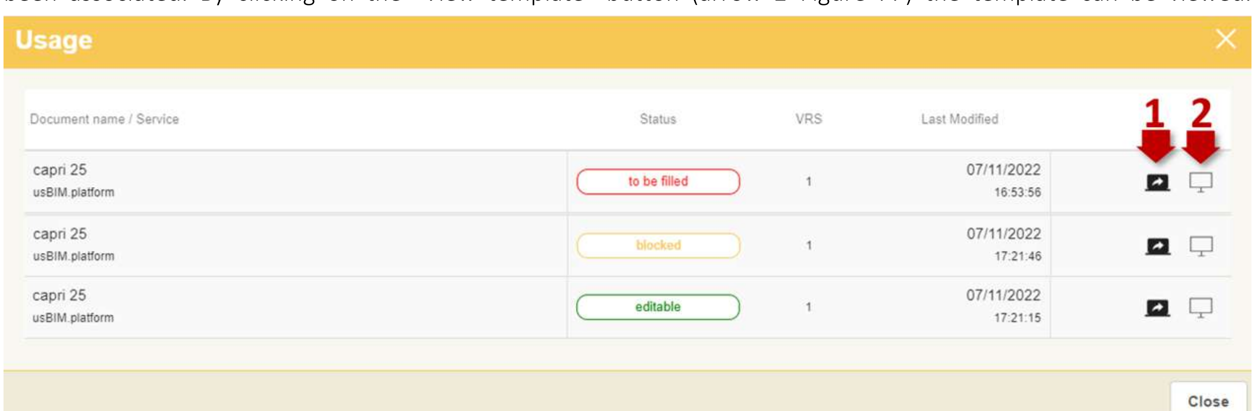

Figure *77. Template use*

5.4.2 Data filter

You can search on usBIM all templates created with usBIM.data and all the linked documents. By clicking on the "usBIM.data" filter section (arrow 1 Figure 78), on the left you will see the list of all the templates present in the project. By clicking on one item from the list, you will access to all the fields and the related values. The latter can be selected (arrow 2 Figure 78), thus becoming the search key for all documents that contain that specific value (arrow 3 Figure 78).

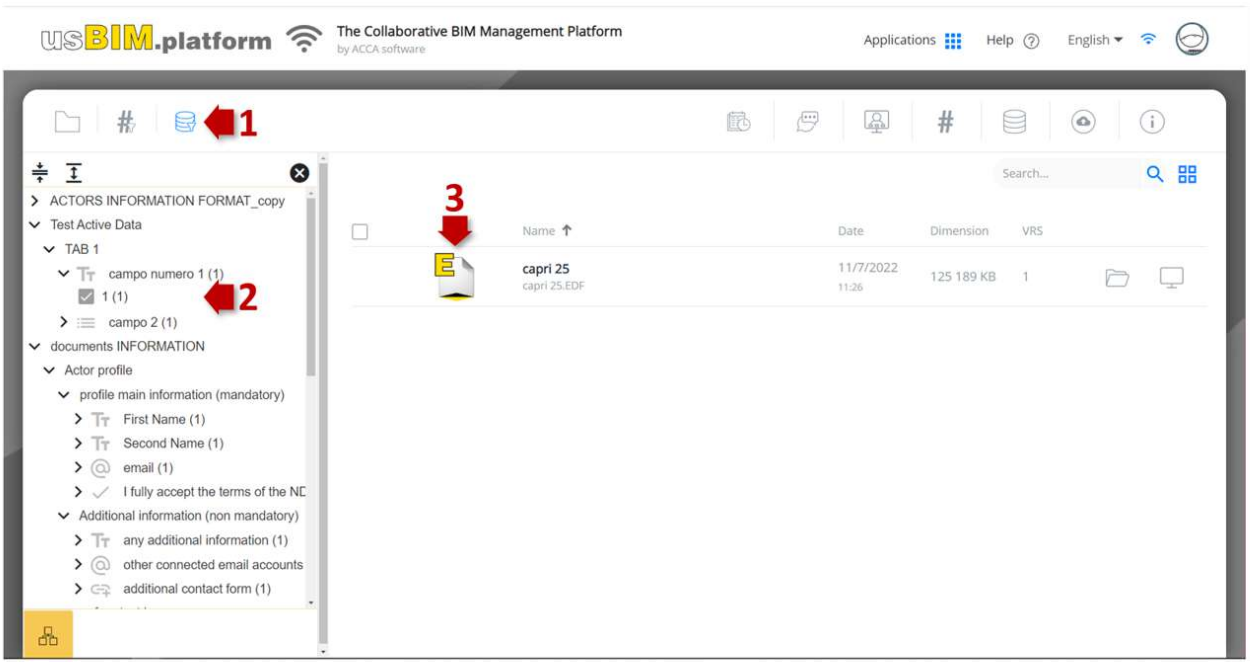

Figure *78. Data filter*

5.4.3 Associating a template with a 3D model in usBIM.browser

In order to associate a template created with usBIM.data with a 3D model or its elements, proceed as described below.

Open the document with usBIM.browser (see par. Once this is done, if you want to associate a template with the entire model, you must access the "Connected data" section (arrow 1 Figure 79) and then click on the "+" button (Add models) at the bottom right of the page (arrow 2 Figure 79). Select one or more templates (arrow 3 Figure 79) from the window and confirm (arrow 4 Figure 79).

Figure *79. Attaching a template to a 3D model*

If, on the other hand, you need to connect the template to an object in the model or to several objects at the same time, you must first select them (arrow 1Figure 80) and then access the "Linked data" section (arrow 2Figure 80). Click on the "+" button (Add templates) at the bottom right (arrow 3Figure 80) of the page. Select one or more tabs (arrow 4Figure 80) from the new window and click on confirm (arrow 5Figure 80). Then you can proceed as described in the paragraph5.4.1.

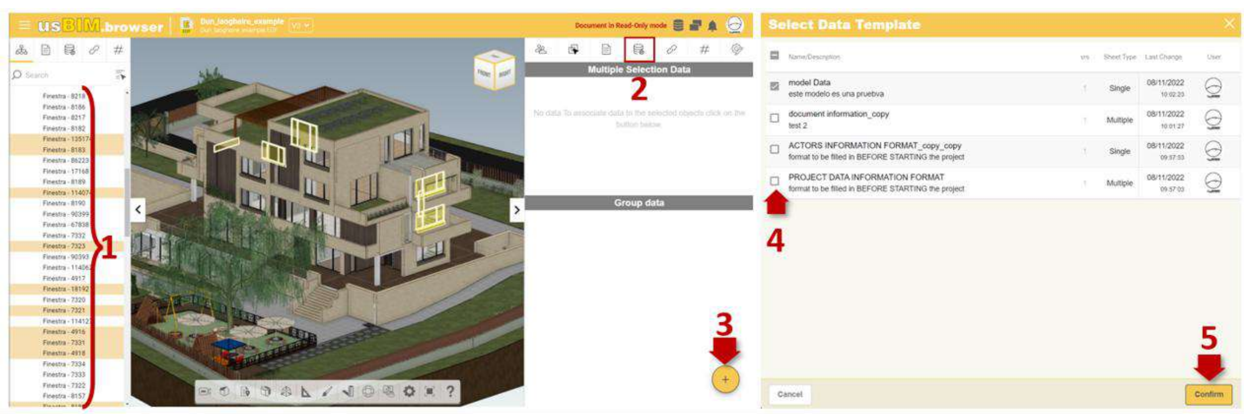

Figure *80. Attaching a template to a selection of model objects*

When associating templates with a multiple selection of objects, there is a double option:

1. By choosing an object from the multiple selection, you can change the data in the associated template for all objects in the selection. To do so, select an object (arrow 1 Figure 81), go to the Group Data section and open the associated template by clicking on the "Edit data for the entire group" button (arrow 2 Figure 81). When the changes are complete, they will propagate to all the objects in the group.
2. By choosing an object from the multiple selection, you can change the data in the associated tab for only the selected object. To do this, select an object (arrow 1 Figure 81), go to the Group Data section and open the

associated section by clicking on the "Edit data for the entire group" button (arrow 2 Figure 81). Therefore, these changes will be related to the selected object only, despite being part of a group of objects.

It is also always possible to associate a new section with an object that belongs to a group, without it being visible on the other objects in the group. To do this, simply select the object and proceed as described in the paragraph 5.4.1.

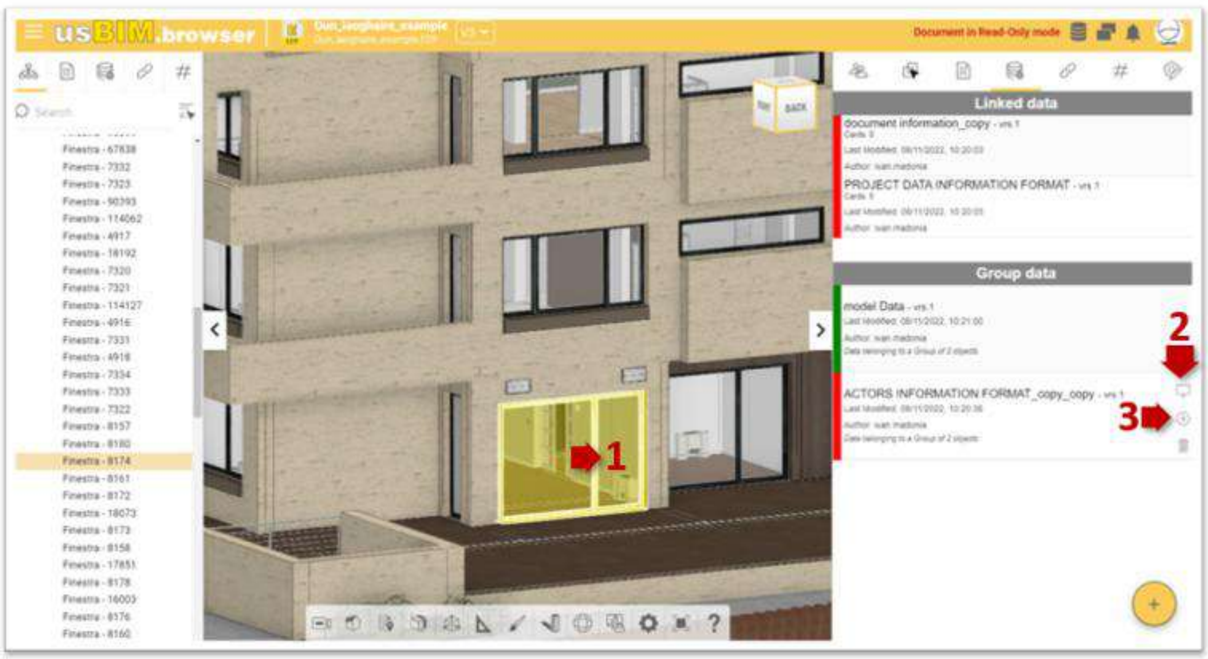

Figure *81. Group data*

Even usBIM.browser allows you to filter the templates through the data associated with them (see par. 5.4.2).

5.4.4 Subscription model not editable at project level

As specified in the paragraph, 5.2.1 an usBIM.data template can be made non-modifiable, in its structure, at project level. In this case, when the model is retrieved within the project, a window shows this message: "The selected model cannot be modified at project level. Click Create to confirm" (arrow 1 Figure 82). You must click on "Create" to continue (arrow 2 Figure 82).

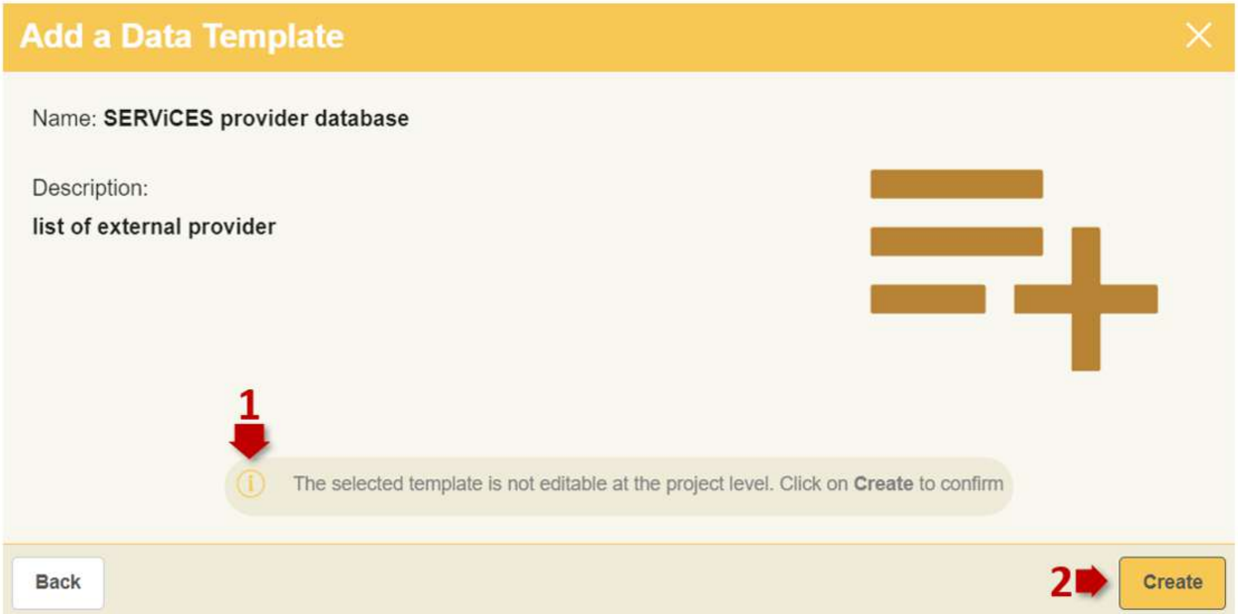

Figure *82. Subscription model not editable at project level*

The template is now available as a project template. If the template is updated at subscription level, then a project-level icon (arrow 1 Figure 83) appears notifying the user of the availability of a newer version of the template. At the same time, an alert with a dynamic link (arrow 2 Figure 83) will appear, along with the "Update duplicate model" (arrow 3 Figure 83) message that refers to the new version of the template.

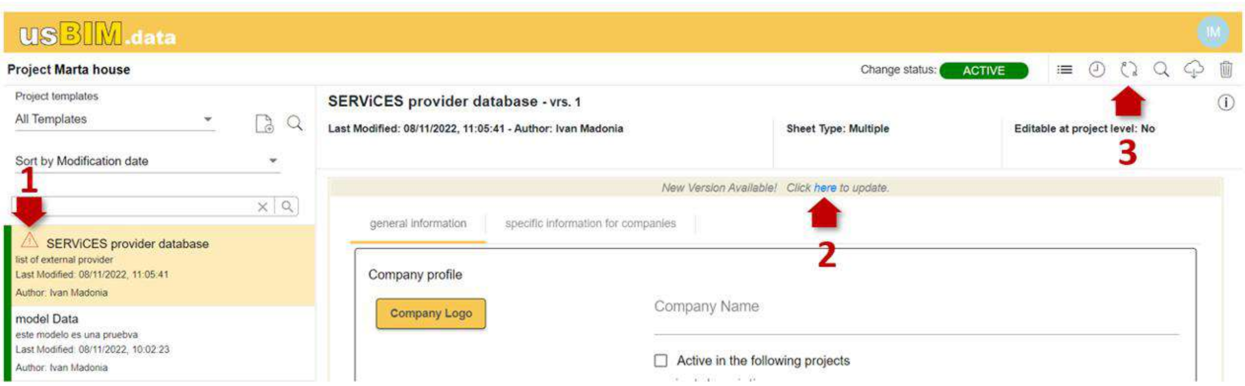

Figure *83. New version available*

Once chosen one of these two options, a new window appears that shows a template preview (arrow 1 Figure 84). Click on "Confirm" to apply the update to the template (arrow 2 Figure 84).

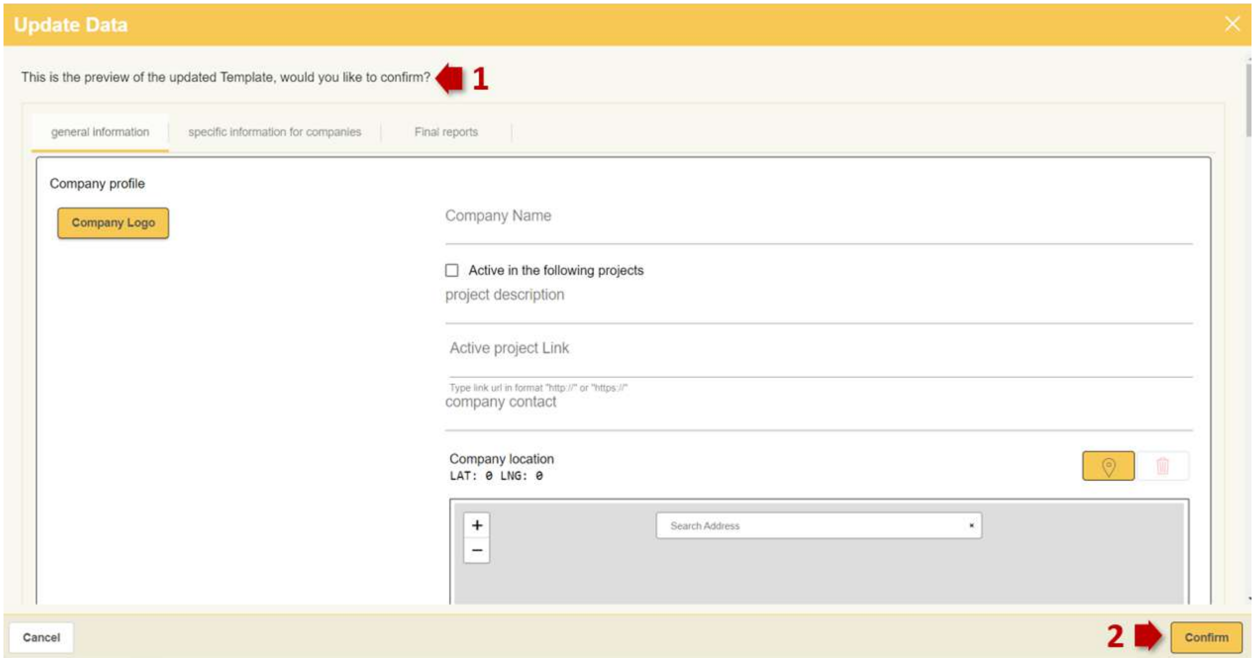

Figure *84. Update Data Template*

6 Workspace Management

This section describes how to manage users on the individual project. In particular, the methods of adding stakeholders and the possible assignment of specific roles that determine their operation, together with the permits, within the project are highlighted. Specifically, to create the project master, you must access it from the Workspaces section and proceed as described below.

6.1 Creating a new Workspace

To create a new Workspace, (arrow 1Figure 85) click on the "New Workspaces" button. A pop-up requiring project information will be shown Figure 86.

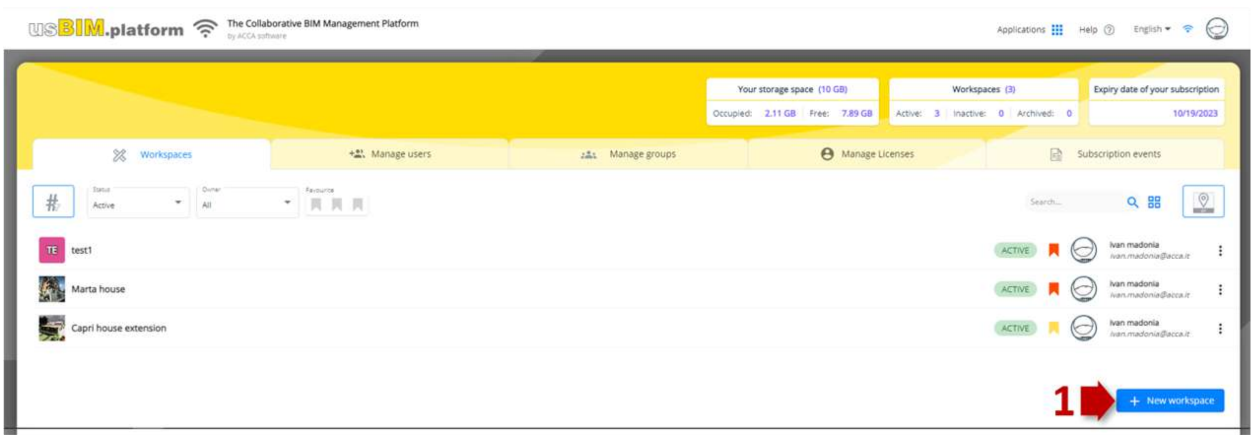

Figure *85. Projects main page*

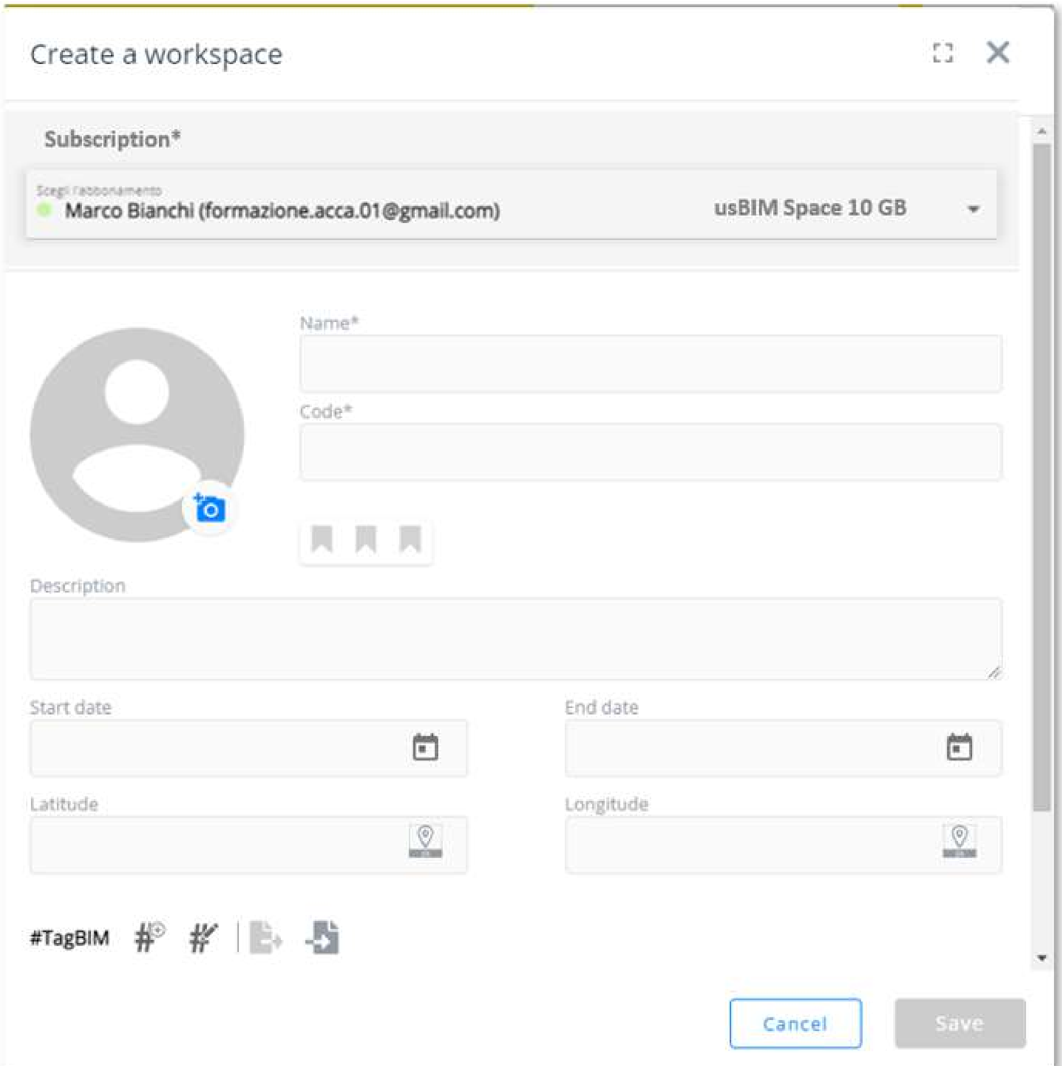

Figure *86. New Project pop-up*

The required fields to be entered are listed below:

- Workspace name: this is the name that will uniquely identify the individual workspace within the platform
- Workspace code: the code that will uniquely identify the individual workspace within the platform. There are no constraints in the text to be inserted in the code structure.
- Add to favorites: you can set a degree of preference by selecting one of the three levels. This information allows you to organize the projects view in the Dashboard.

- **Choose Subscription**: you can choose the subscription under which a new workspace will be created. This field is enabled only if the user is profiled with the role of delegated PA on another subscription.

On the other hand, the following fields are optional:

- **Description**: for a potential summary description of the project
- **Start and end date**: useful field to indicate the start and end date of the project (this is non-binding information and can always be changed)
- **Latitude and longitude**: by setting the location from the "Position" section, the fields are filled in automatically. Alternatively, it is possible to fill them in manually.
- **#TagBIM:** metadata (#TagBIMs) can be assigned to the workspace and filtered according to the search needs. It is also possible to import/export the #TagBIM structure.

To make the changes effective, click on the "Save" button.

After creating a project, you can proceed with its configuration by opening the "Edit Project" section. To do so, simply click on "Edit" from the three-dot symbol menu. *(*Figure *87*).

Figure *87. Project Edit section*

This will open a window such as the one shown in Figure *88*.

Please note: The context menu can also be opened by clicking on the workspace line with the right mouse button.

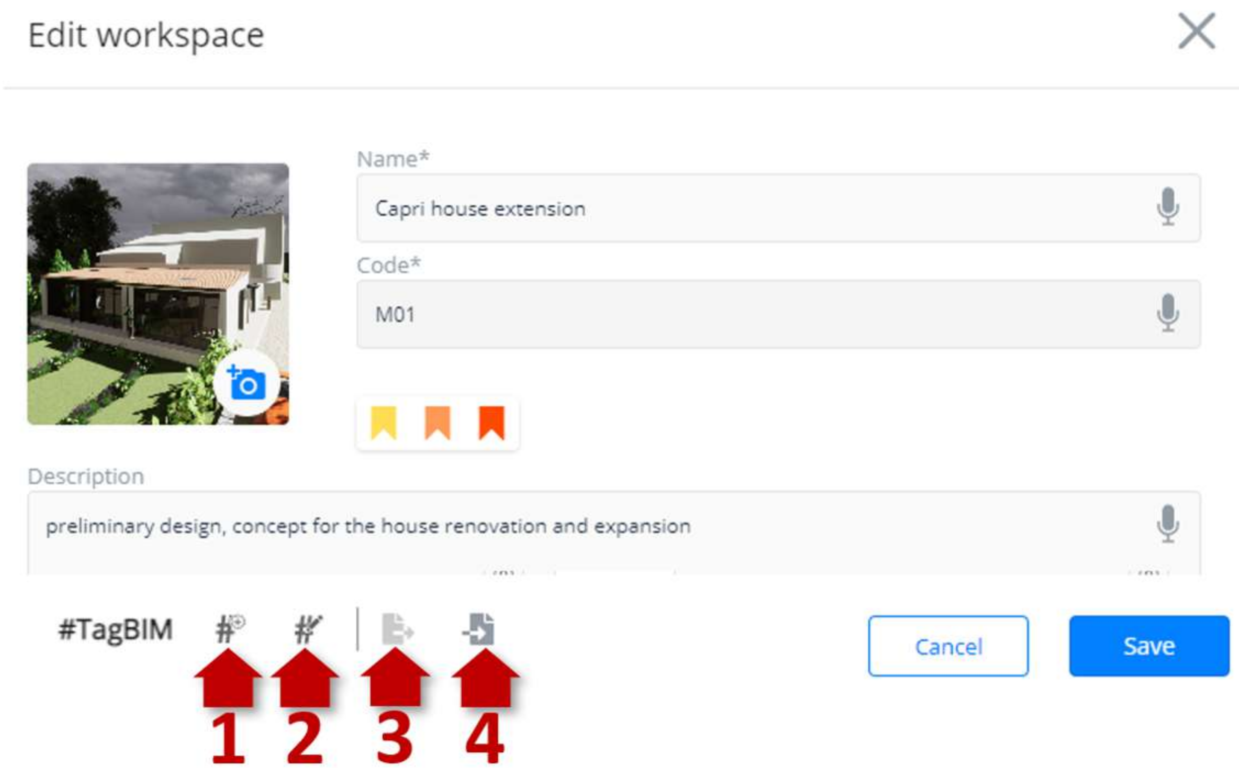

Figure *88. Edit Project pop-up*

In this section, you can access all the functions for the configuration and management of your project.

Apart from the fields already analysed for the creation phase, in this section you can also assign a status to the Workspace:

- **Status**: the current situation of the project; it can be as follows:
  - Active - if the project is currently being processing
  - Inactive - if the project processing is paused. In this case
    - **PA, PA delegate and BIM Manager** will have access to the project as if it were active
    - **Standard users** will not have access to the project
  - Archived - if the project processing is complete. In this case
    - **PA, PA delegate and BIM Manager** will have read-only access to the project, without being able to make changes
    - **Standard users** will not have access to the project

N.B. The status of a project is always reversible. It can be edited by PA, PA delegate and BIM Manager profiles.

6.1.1 Project Metadata

The Edit Project tab (Figure *88*) associates metadata (#TagBIM) with the project, just as described in the paragraph 6.3.4.1. You can also import/export the #TagBIM structure (Arrow 3 and Arrow 4 Figure *88*).

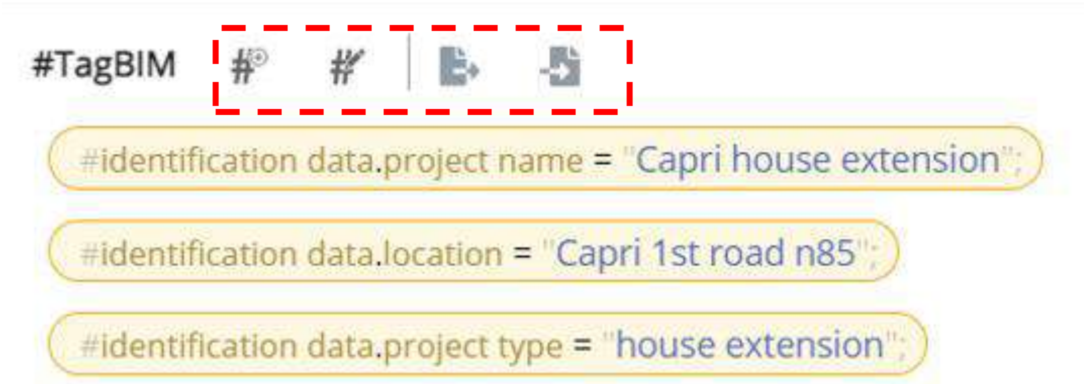

Figure *89. #tagBIM editor*

These tags can be used to filter projects within the Workspaces section (see par. 3.3). In fact, through the #tagBIM, it is easier to trace a project to which a specific metadata is associated.

6.2 Project User Management

This section describes how to manage users on the individual project. In particular, the methods of adding stakeholders and the possible assignment of specific roles that determine their operation, together with the permits, within the project are highlighted. Specifically, to create the project master, you must access it from the Workspaces section and proceed as described below.

6.2.1 Adding Users

After logging into the workspace, in the "Workspace user management" section (arrow 1 Figure *90*), you can add new users and simultaneously view those already present in the registry. To enter a new user, click on the Add User button (arrow 2 Figure *90*).

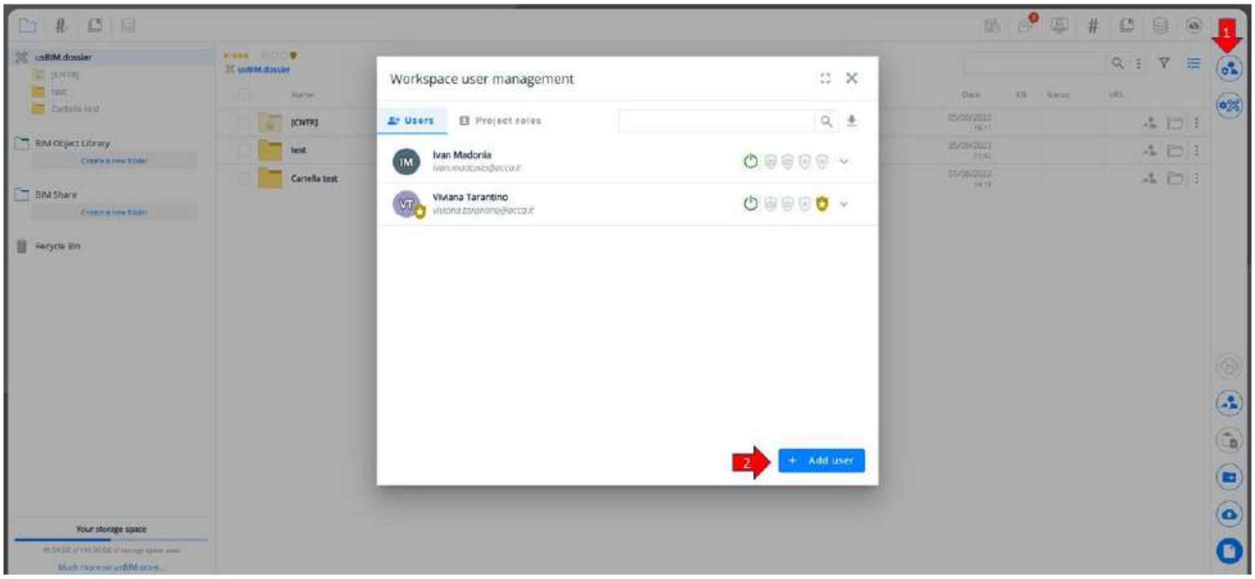

Figure *90. Workspace User Management*

In the modal it is possible to add a new email address or select one from the list of the subscription data (see par. 3.4). Through the "Active until" option it is possible to define an expiration date after which the user will no longer be active on the project (Arrow 1 Figure *91)*. Again, with the "Use user data" button you can inherit all the data related to that account (name, surname and photo) (arrow 2 Figure *91*). This operation is only allowed for PA and delegated PA figures.

<u>Please note: The BIM Manager, on the other hand, can only select a user if it is present in the list of users at the subscription level.</u>

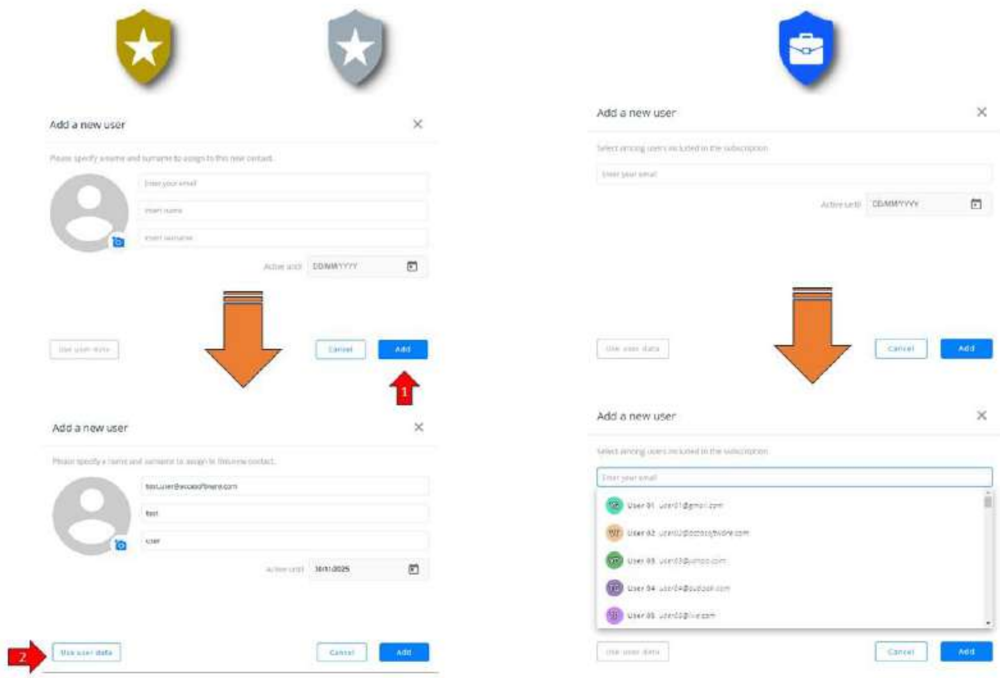

Figure *91. Add New User*

For each profiled user, in the "Workspace user management" section, it is possible to manage their status (active or inactive) in order to allow them to be operational or not on the reference project (Arrow 1 Figure *92*). Furthermore, from this section it is possible to choose which and how many users should act as Guest (see par. 3.4) (arrow 2 Figure *92*) or BIM Manager (arrow 3 Figure *92*).

N.B. Only the Platform Admin and the delegated PA can profile a BIM Manager on the project.

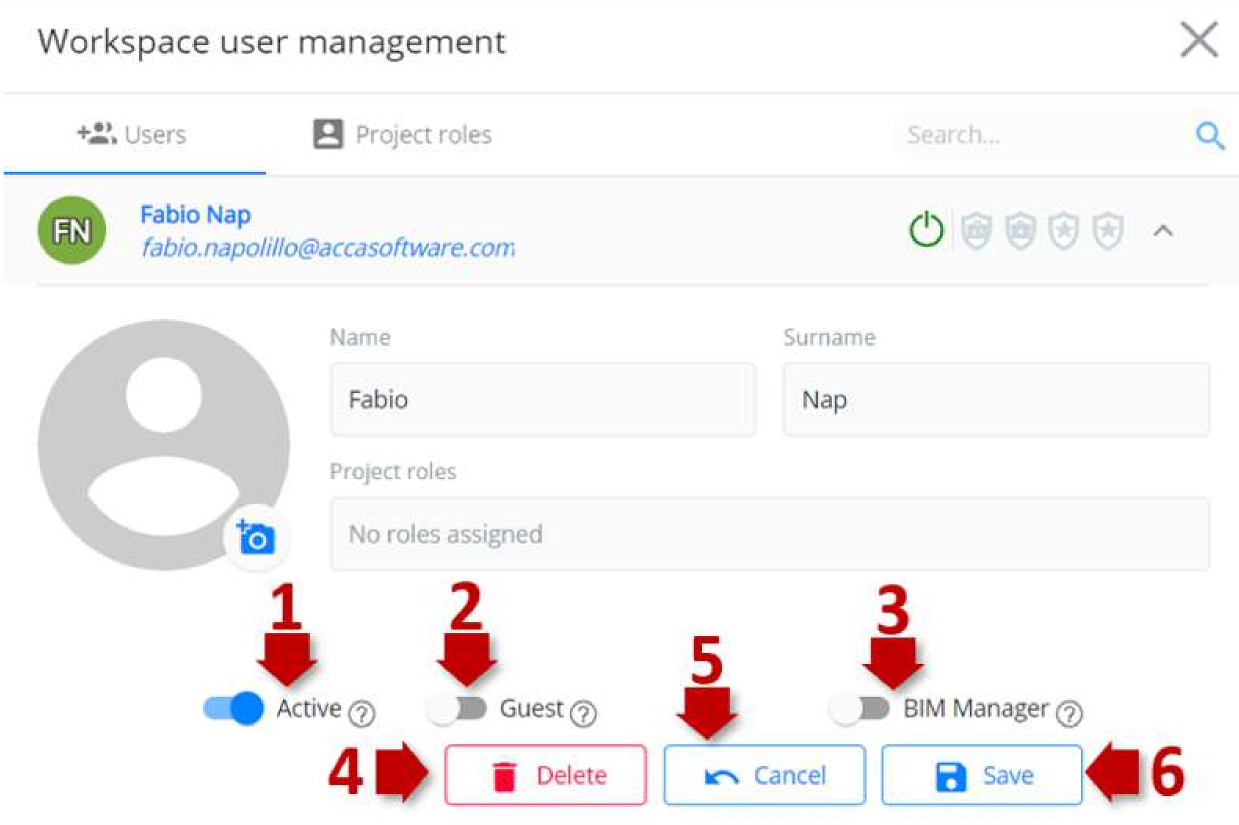

Figure *92. User Status Management*

The delete button (arrow 4 Figure *92*) deletes the user, the cancel button (arrow 5 Figure *92*) all changes are canceled. As against in order to make the changes effective and finish the operation, you must confirm with the save button (arrow 6 Figure *92*).

Once saved, each user will be associated with an icon that represents their classification in the platform (Figure 93):

Figure *93. Key to user icons*

6.2.2 Role management

Defining a Role and associating it with a User, is an operation that comes in handy when assigning permissions and tasks. It will allow you to manage permissions on project folders more easily, representing an accelerator when selecting users. The definition of the role, managed by PA, PA delegate and BIM Manager, is completely free since there is no predetermined information.

From the workspace user management window (Figure *94*) you can assign roles to individual users. To create a role, click the Create Role button (arrow 1 Figure *94*) and define the role name (arrow 2 Figure *94*). Finally, it is possible, through the "Users" button (arrow 3 Figure *94*), to assign or add new users to a Role by clicking on the "Add User" button (arrow 5 Figure *94*). To make the changes effective, click on the save button (arrow 6 Figure *94*).

To delete a role, click on the Delete button (arrow 4 Figure *94*).

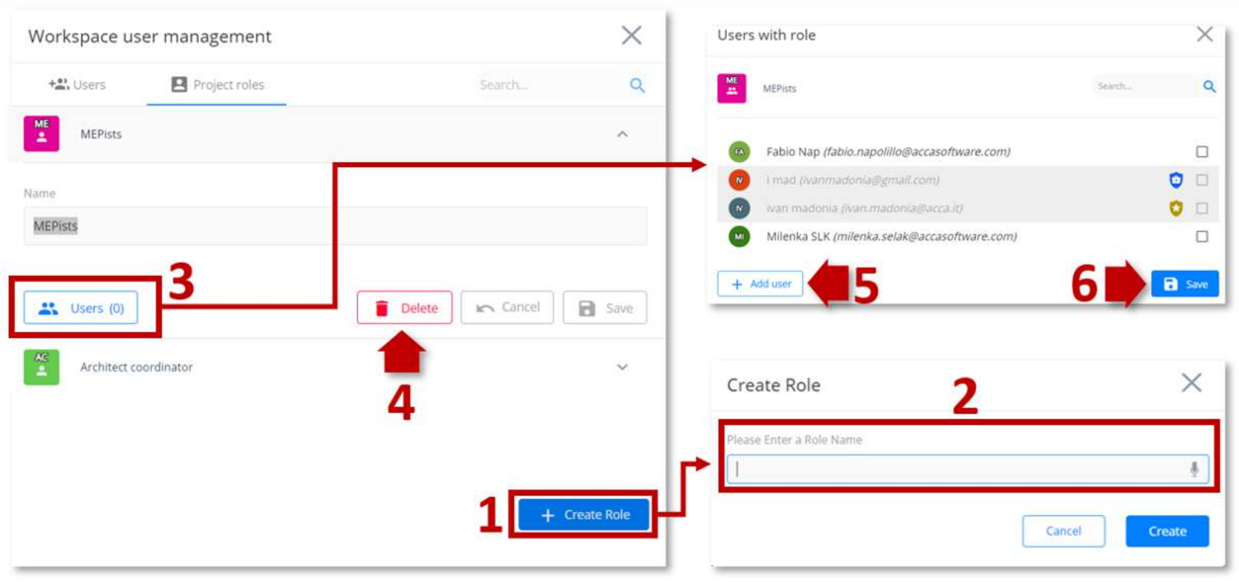

Figure *94. Role management*

6.3 Workspace structuring and document management

All the platform features useful for managing a BIM project are described in this paragraph. Specifically, the methods of structuring the project tree, in folders and subfolders, and the tools useful for document management are shown.

6.3.1 Project Folder

A workspace is always characterized by three sections, which can never be deleted, through which to structure and manage project information. In particular:

- Workspace: we strongly suggest an organization of the folders in order to recreate all the sections useful for managing the project information process. More specifically, the permissions to be assigned to the various professionals involved in the process;
- BIM Object Library: organize the underlying folders in order to recreate the objects categories used in the project too;
- BIM Share: in this environment, which is transversal to all projects, you can access the information that has been shared by system administrators

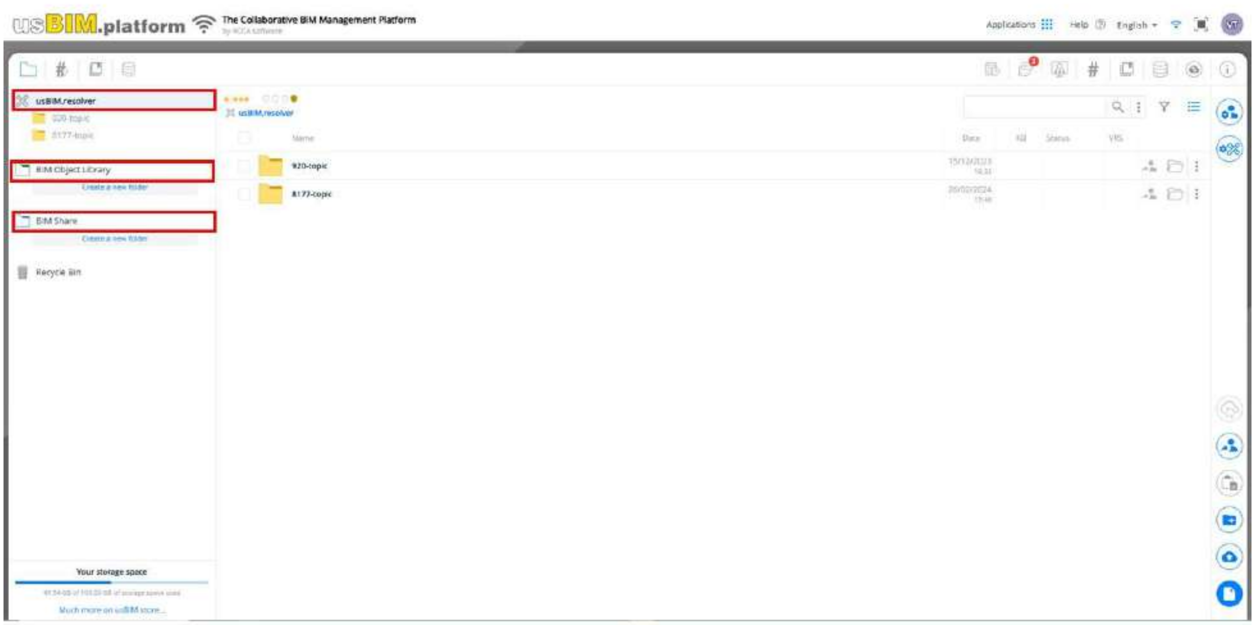

Figure *95. Workspace Environments*

6.3.1.1 New Folder

To create a new folder, select the starting node highlighted by the project name, click on the three dots menu and select "New Folder"(Arrow 1 Figure *96*), or click on the folder icon at the bottom right as shown by (Arrow 2 Figure *96*). In both cases, type the name of the new folder and click on "Confirm" to complete the operation.

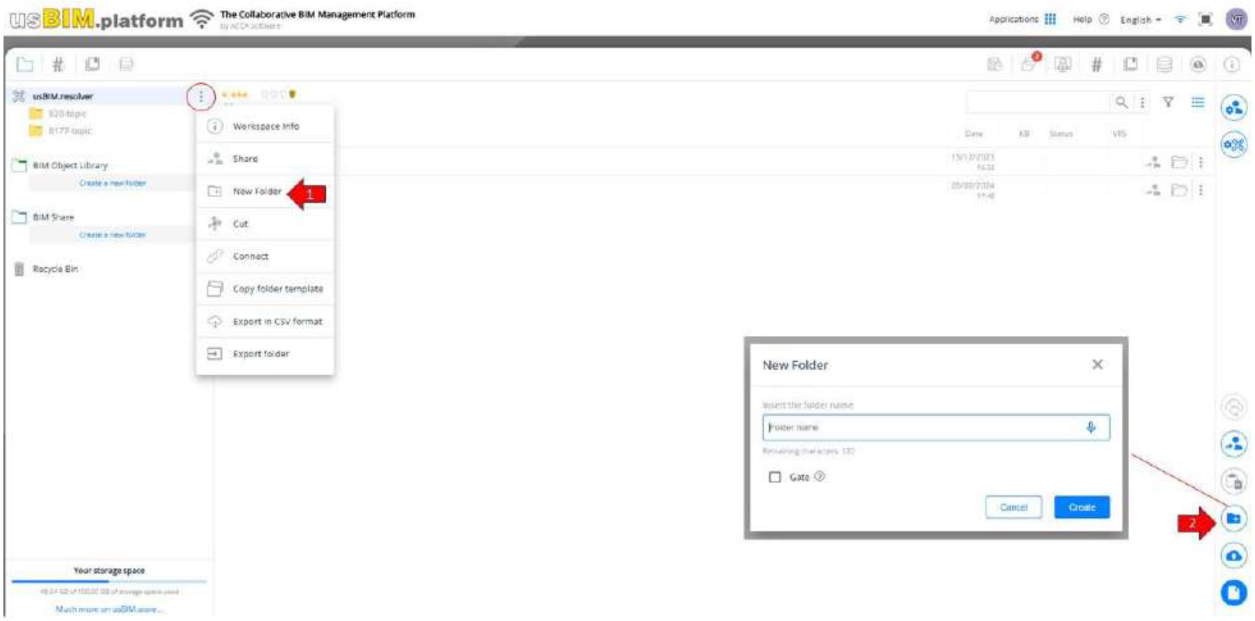

Figure *96. Creating a new folder*

In addition, the platform allows you to create new folders from already determined project structures. In this case, enter the reference project, position yourself on the folder to be copied (with its subfolders), click on the three dots (Arrow 1 Figure *97*) and choose the "Copy folder template" item (Arrow 2 Figure *97*).

Figure *97. Copy Folder Template*

At this point, by positioning yourself on the destination project, through the "Paste folder template" function (arrow 1 Figure *98*) you can paste the copied structure. This feature, available to all users of the platform, also allows you to inherit any associated permissions through "Group", "Role" or "All" (arrow 2 Figure *98*).

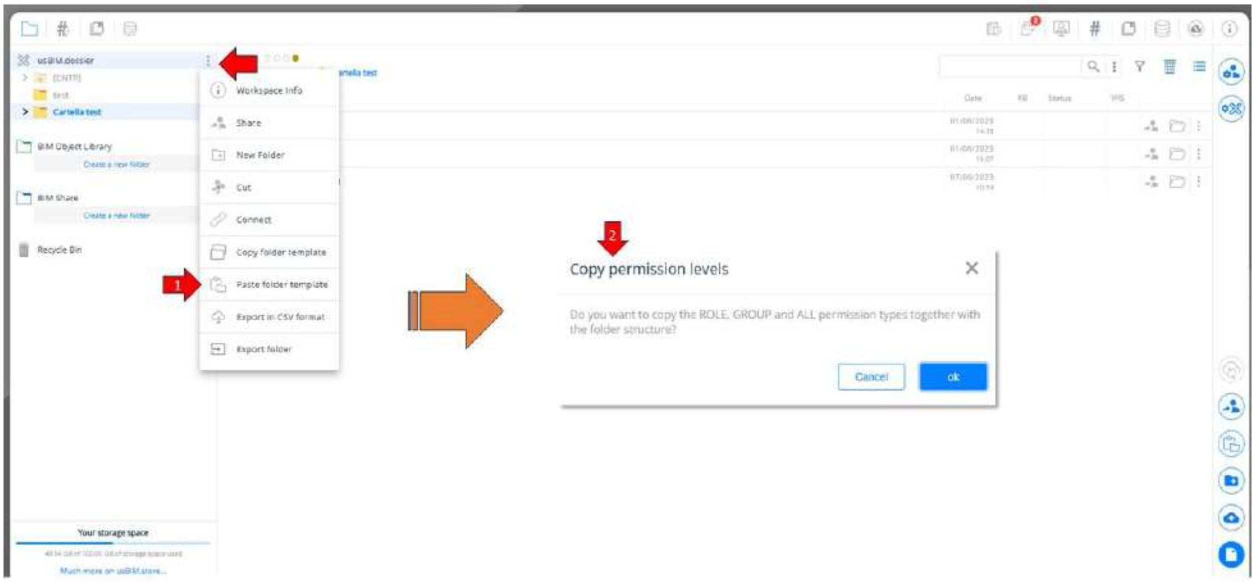

Figure *98. Paste Folder Template*

6.3.1.2 File name rules

usBIM.platform allows you to set control rules on the nomenclature of the files that are uploaded to the platform in order to verify that it complies with the requirements. These rules must be applied to the individual folders.

To define a control rule, click on the folder context menu, select the File name rules key (Arrow 1 Figure *99*). In the new modal, you can type the Regular Expression directly or simply describe it in the appropriate box (arrow 2 Figure *99*). In this second case, the system itself, thanks to the application of artificial intelligence, will compose the REGEX. Then click on Apply (arrow 3 Figure *99*) to view the result. Once the rule has been defined, it can be deleted, copied or modified (arrow 4 Figure *99*) or tested to verify its correct operation (arrow 5 Figure *99*).

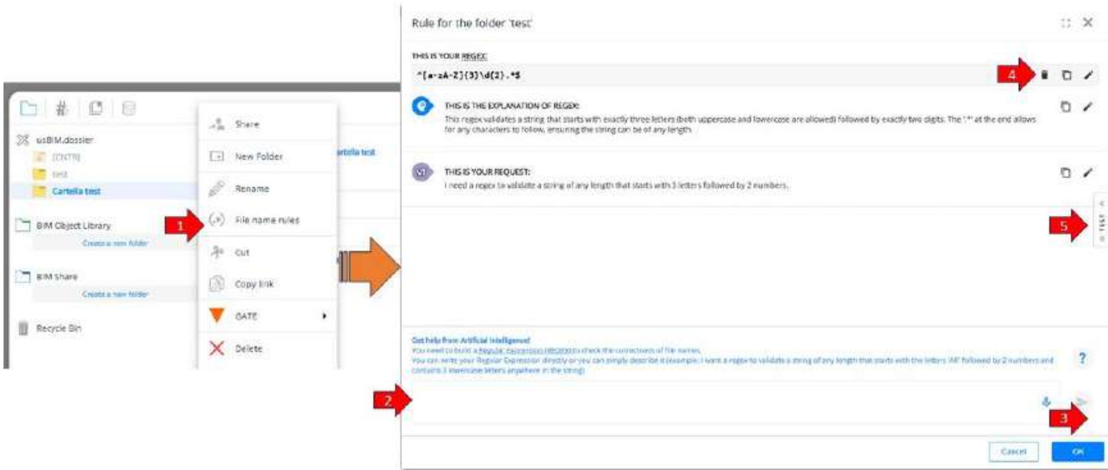

Figure *99. File name rules definition*

In particular, to carry out the test you have several possibilities (arrow 1 Figure *100*):

1. Manually enter the name of the file to be verified
2. Retrieve file names already uploaded to the folder
3. Recall the names of one or more files saved on your PC (documents will not be uploaded to the platform)
4. Import a list of names through a CSV
5. Export the list of names used for the test

The outcome of the verification will be marked with a green (positive) or red (negative) icon.

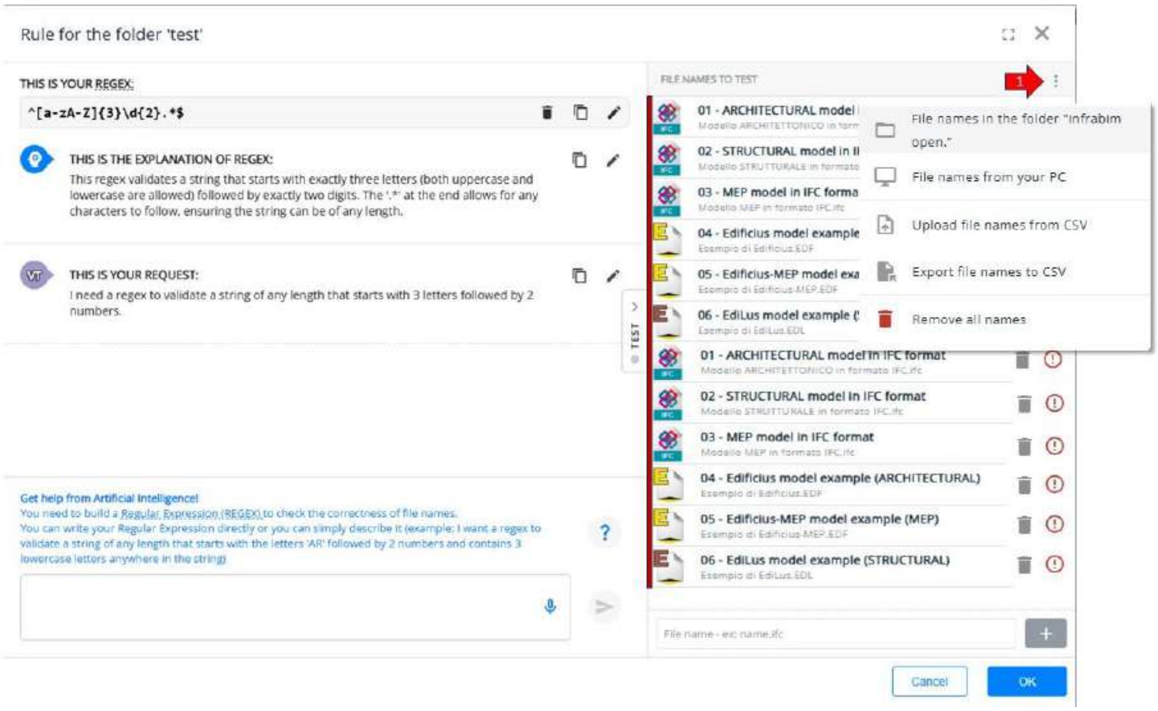

Figure *100. File name rules*

6.3.1.3 Export folder

By accessing the folder context menu (Arrow 1 Figure *101*), clicking on export folder (Arrow 2 Figure *101*) you can export the documentary content. Once this has been done, the user will receive an email to the email address associated with the usBIM.platform service containing a link, available for 7 days, to download the documentation. The export operation will produce a .zip file containing the folder structure, the document content and an excel sheet that reports some information related to the documents (versions, path, #tagBIM). At the end of the export, the file must be saved locally by choosing the destination path.

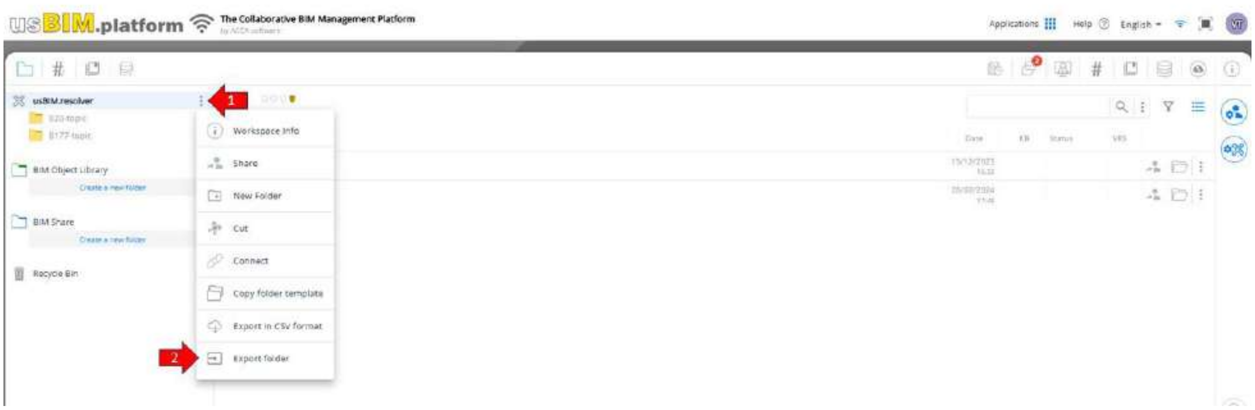

Figure *101. Export folder*

6.3.1.4 Structured Upload

You can upload a folder, and any subfolders, within the workspace, from local, with a drag&drop, or by clicking on the button indicated by (Arrow 1 Figure *102*) and selecting upload folder from your PC (Arrow 2 Figure *102*). It will create a structure identical to the original one with all the files contained within it.

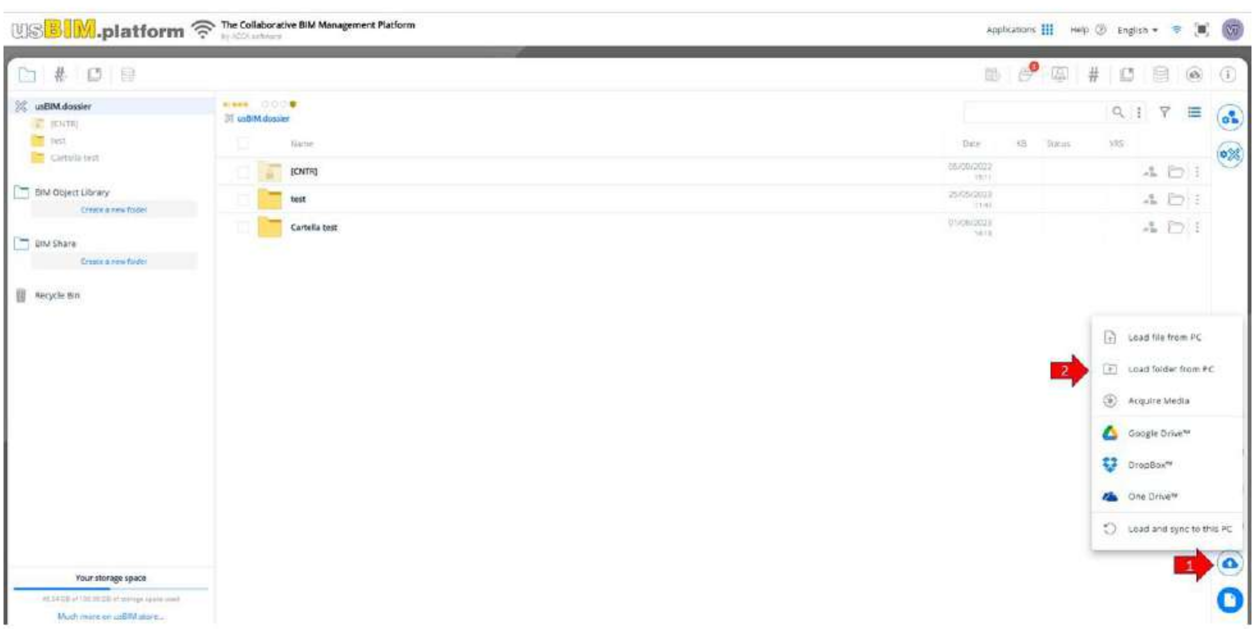

Figure *102. Upload folder from PC*

6.3.1.5 Edit / Delete Folder

To delete a folder, simply access the three dots menu of the folder (Figure *103*) and select "Delete". In order to delete a folder, you must first delete all the files and folders contained in it. Please note that folders with GATES where documents have been uploaded cannot be deleted. To modify a folder, simply access the menu by clicking on the three dots (Figure *103*) and click on “Rename”. A window will pop up as shown in Fig Figure *103*. It will give you the option to either change the name of the folder or provide it with a Gate (see par. 6.3.2).

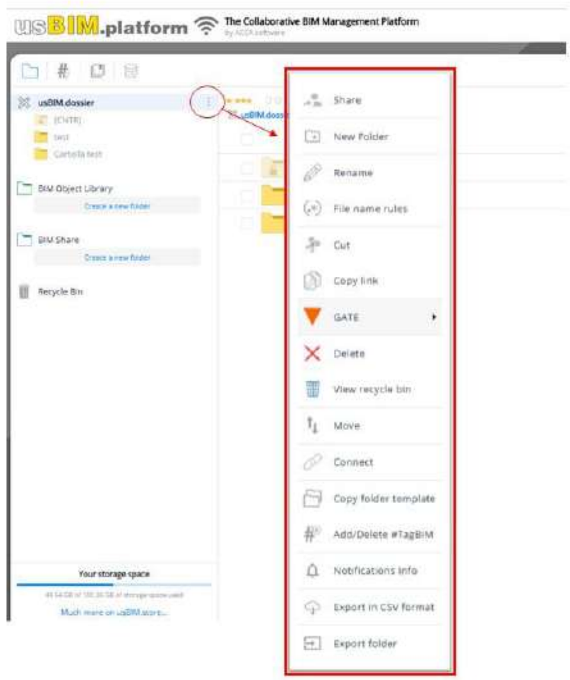

Figure *103. Folder Management Menu*

6.3.1.6 Sharing

You can share the entire Workspace using the share option, at the bottom right, in the project home screen. Instead, to share the single folders, you will need to use the share option by selecting the folder menu

In the sharing settings we can manage permissions on project folders.

The different levels of permission are listed below:

- **Viewing**: the user views and downloads all the contents of a folder but cannot load anything (first level);
- **Upload**: the user can upload files, and can only view the documentation uploaded (first level);
- **Viewing + Upload** : the user sees and downloads all the contents of a folder and also has the possibility to upload other documentation (second level);

- **Viewing, Upload, and Edit**: The user sees and downloads all of the contents of a folder and uploads other documentation. Furthermore, through the Editing function, they can modify the documentation, delete it or create subfolders (third level).

To access the permission section, select the "Share" icon from the three dots menu on the left side of the panel (Figure *103*).

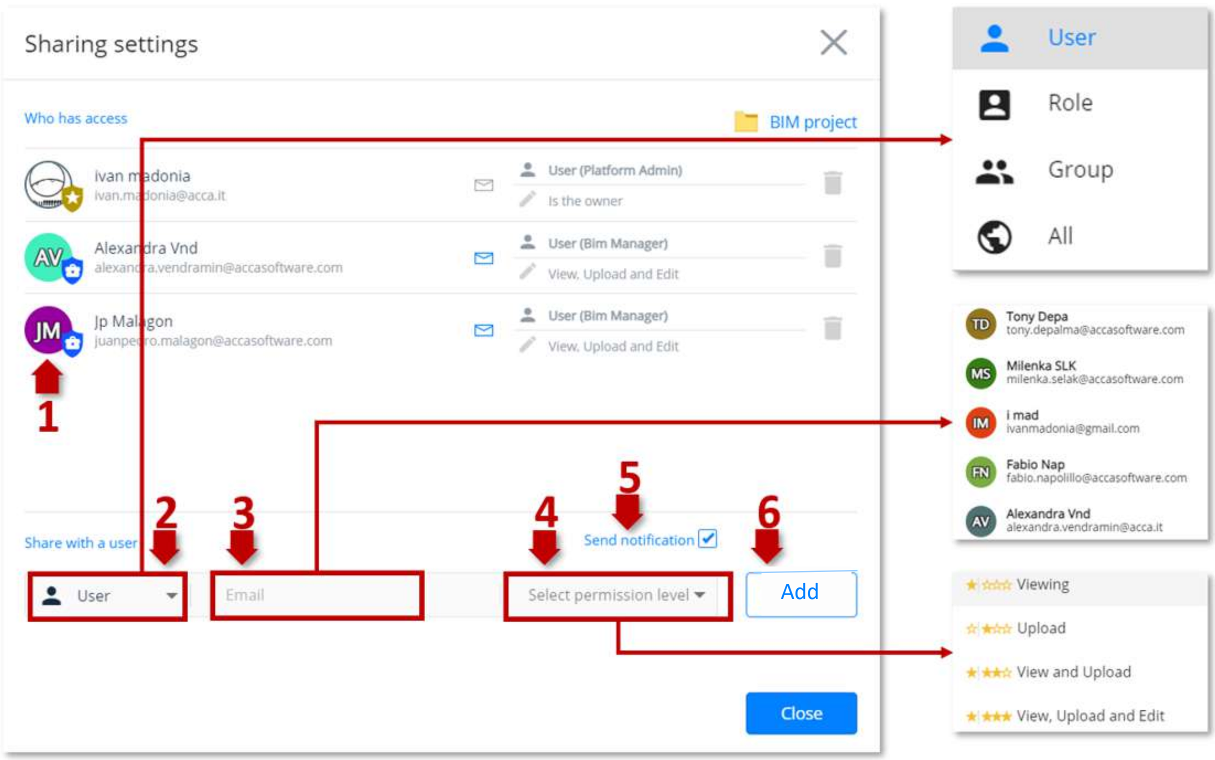

Figure *104. Project folder share window*

A window will then open up where to add people and assign permissions as shown in Figure *104*.

In particular, we can find the following features:

[1] List of users to whom the folder has been shared

[2] Permission options to be selected:

- User: permission is assigned to a specific User
- Role: the permission is assigned to a specific Role
- Group: the permission is assigned to a specific Group
- All: permission is attributed to all project users

[3] Choose the user you want to assign permission to

[4] Select the permission level to assign:

- Visualization
- Uploading
- Viewing and Loading
- Viewing, Uploading and Editing

[5] Send notification:

Choose whether the user you're sharing the folder with will need to receive a message notifications

[6] Add user: click on the “Add” button to complete the operation. To assign a new permission level, you have several possibilities:

A. Assign permission to the top level folder: in this case the types of permission will also be assigned on all sub-folders. For this type of folder it is also possible to add only higher level permissions.

The image below shows the pop-up where you can view permissions assigned to users (arrow 1 Figure *105*) or delete the users along with the related permissions (arrow 2 Figure *105*)

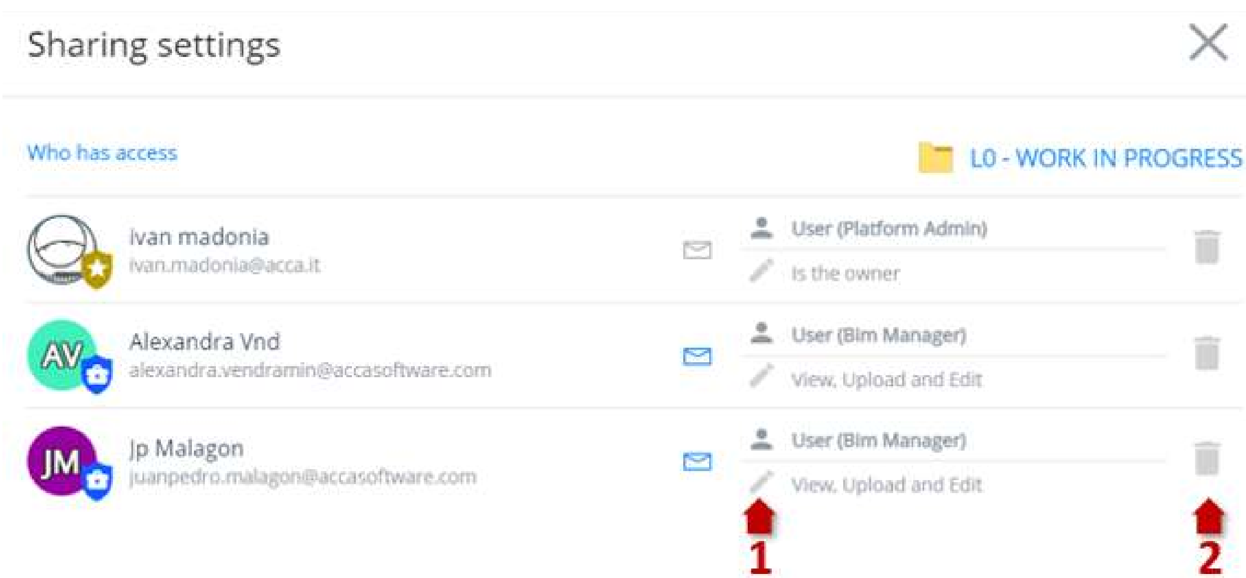

Figure *105. Permission levels assigned to the user*

In the example shown in Figure *106* permission has been assigned to a top-level folder and consequently to all the subfolders highlighted by the red dashed box.

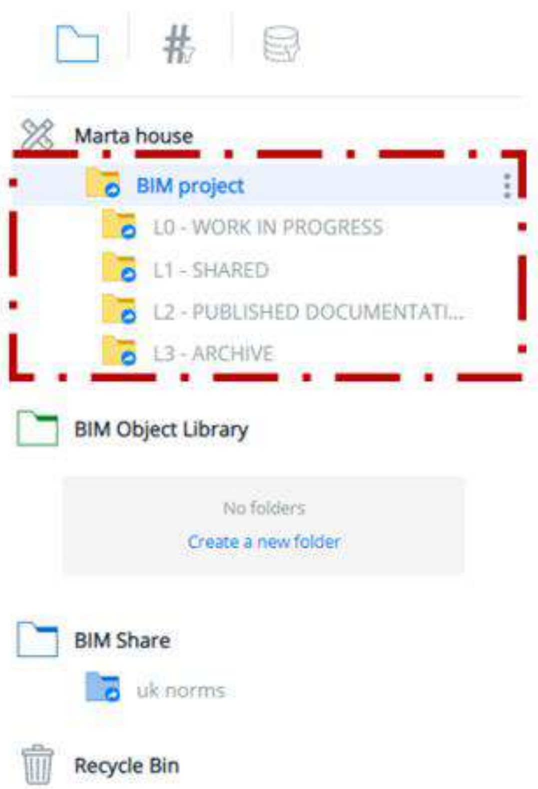

Figure *106. Assigning permissions (a)*

To remove permissions, proceed as described in Figure *105*.

B. Assign permissions to a subfolder: in this case, the permission will be assigned to all lower-level folders. For this type of folders, it is possible to add only higher level permissions. In the example shown in Figure *107*, the permission was assigned to a specific folder, so it was inherited exclusively by its sub-folders, as highlighted in the dashed box.

To remove permissions, proceed as described in Figure *105*.

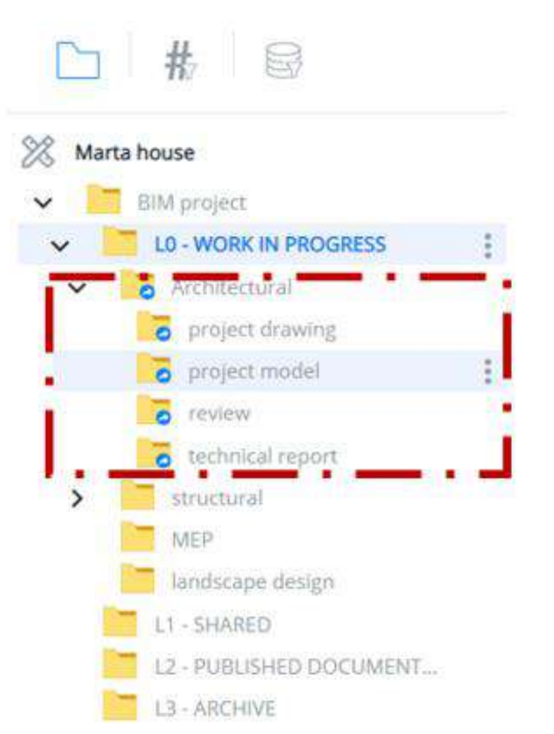

Figure *107. Permission assignment (b)*

C. Assign the permission to a subfolder: in this case the permission types will be assigned exclusively on this subfolder. In the example shown in Figure *108*, the permission was assigned only to the Reinforcements folder. In this case, the permission can be edited with no restrictions, as there are no inheritance constraints.

To remove permissions, proceed as described in Figure *105*.

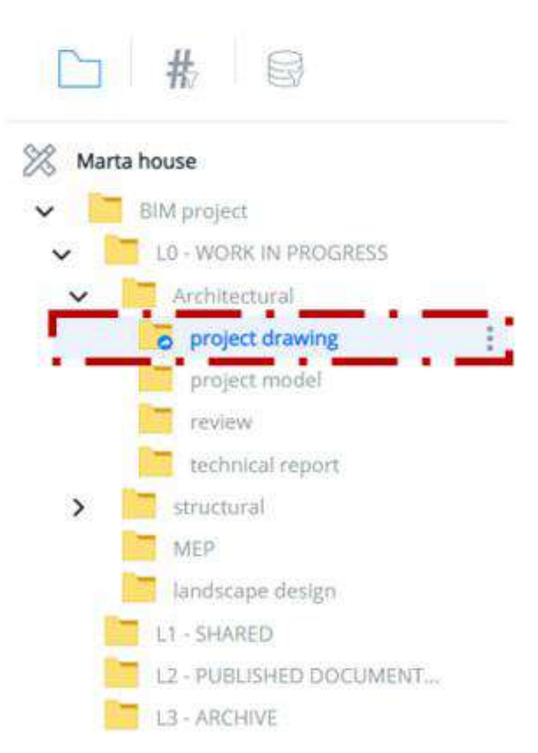

Figure *108. Permission assignment (c)*

The user with whom the folder is shared receives an email inviting them to collaborate containing a hyperlink that guides them to the (Figure *109*) workspace .

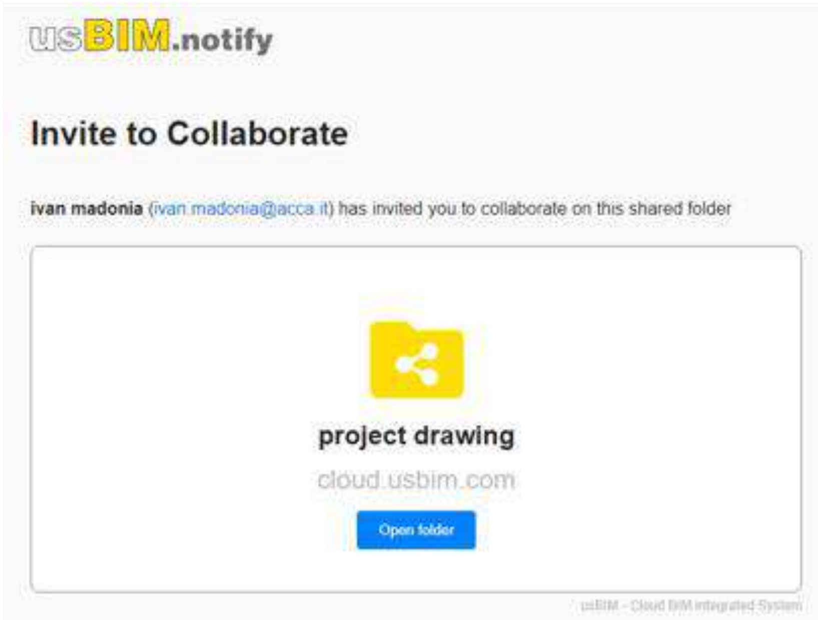

Figure *109. Notification via email - invitation to collaborate*

6.3.1.7 Move Up / Move Down

This feature reverses the order of the folders (possible for the PAs, PA delegates and BIM Managers Figure *110*).

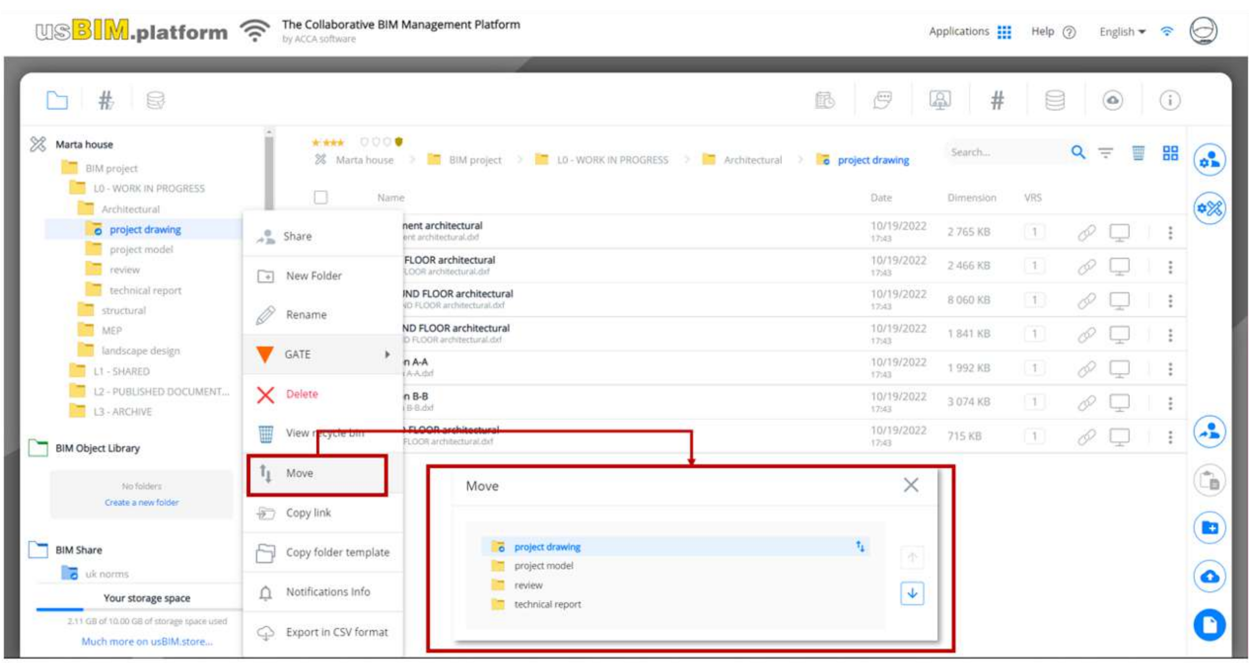

Figure *110. Project Folder Menu*

6.3.1.8 Folder Notification Options

From the "Notifications info" menu of the project folder (Figure *103*), you can enable notifications related events registered in the folder and its contentFigure *111*. To enable or disable a notification, check or uncheck the box in its popup window (Figure *111*). The notification option can be automatically extended to all subfolders by clicking on Extend to subfolders (arrow 3 Figure *111*).

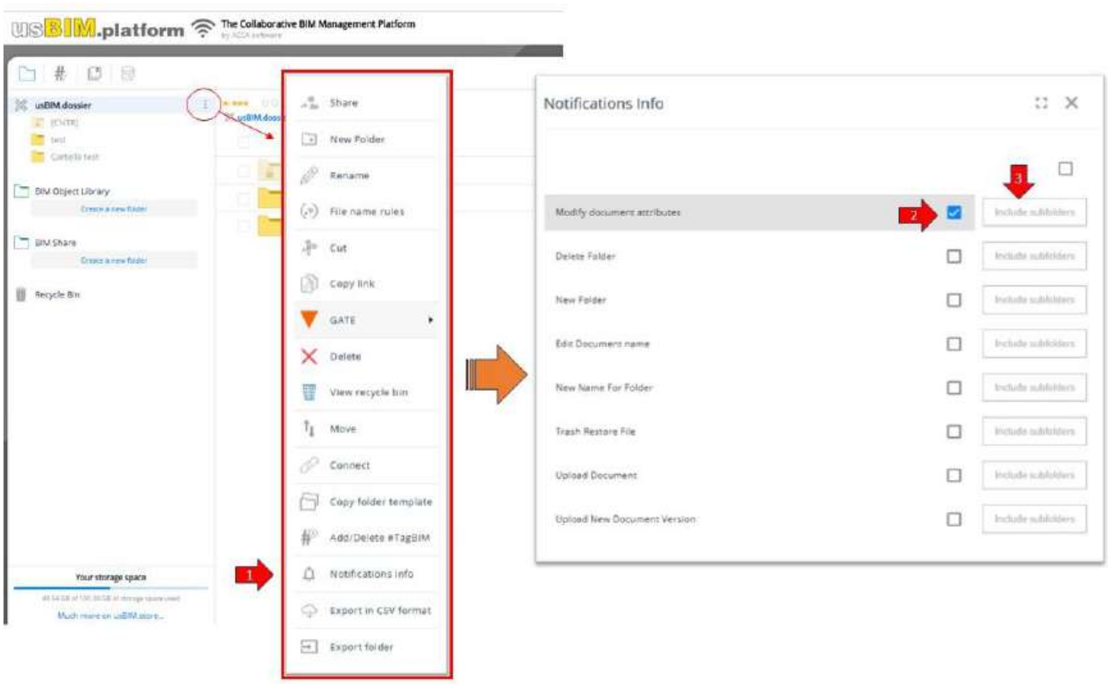

Figure *111. Folder Notifications Options*

If the user enables notifications for a given event, an email will be sent to them when the event is registered (Figure *112*).

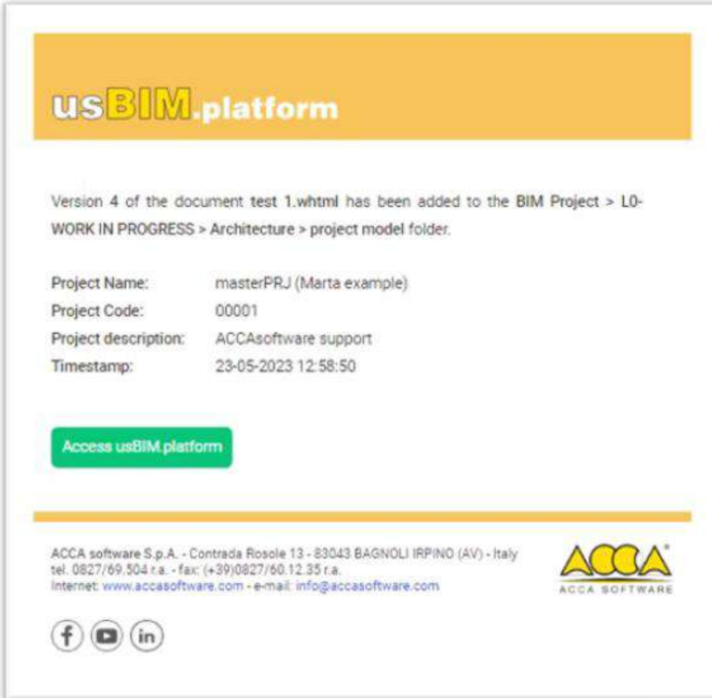

Figure *112. Notification email for information editing*

6.3.1.9 Copy Folder Link

Through this option, the URL of the folder is copied to be attached, for example, through usBIM.browser, to an IFC model, to one of its entities or, again, to a PDF document.

6.3.2 Gate

A Gate is an environment where documents, before being shareable, stay out of this gateway, waiting for a verification process to be completed.

A Gate is a property that can be assigned to a folder.

In order to give a folder the Gate property, a specific checkbox needs to be flagged. (see par. 6.3.1).

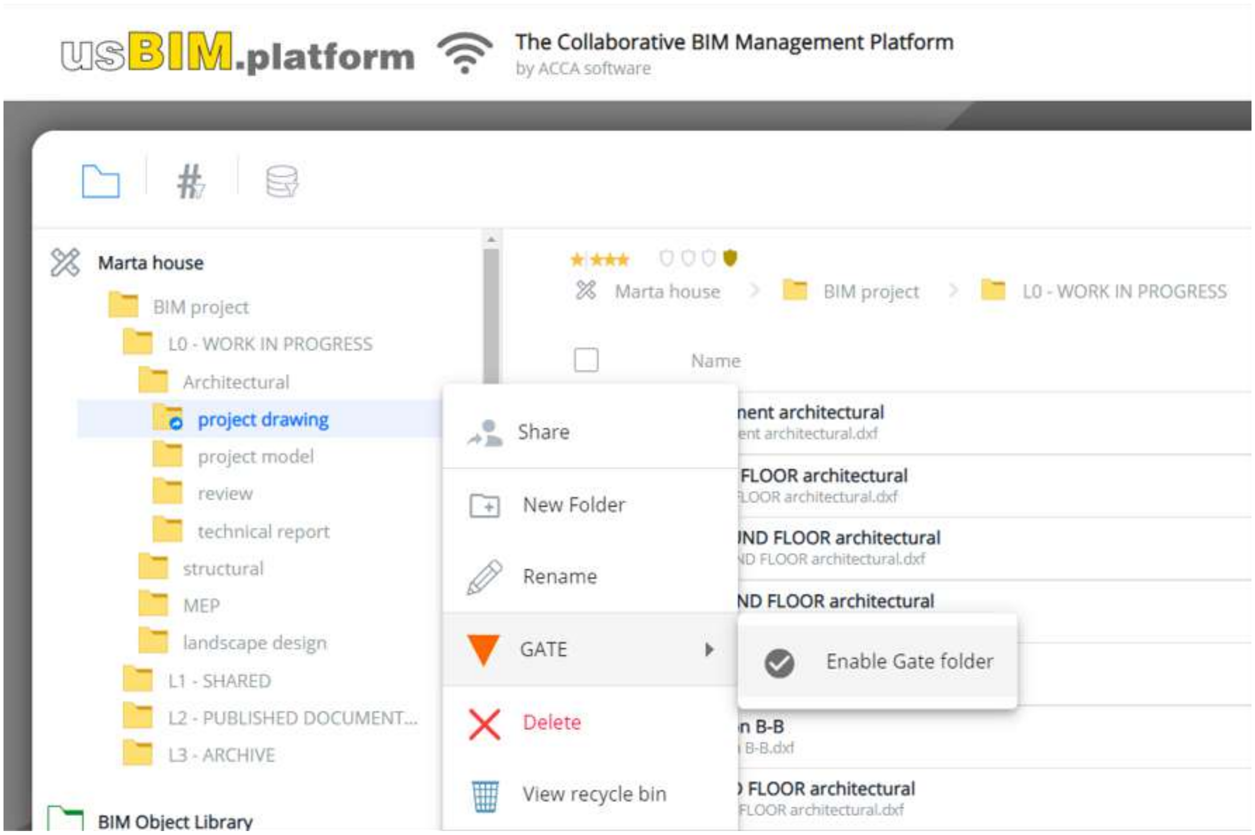

Figure *113. New Gate Folder*

The Figure *113*, instead, shows how to set a Gate property starting from an already existing project folder. Clicking on the Gate button, from the folder menu, will enable the folder to have a Gate. When a folder is provided with a Gate, the icon will be gray until the documentation uploaded is approved. Only then, it will turn red. When a document is copied to a Gate, the arrow in the source folder turns purple. Moreover, this folder cannot be deleted or restored as a simple folder if operations are carried out within it.

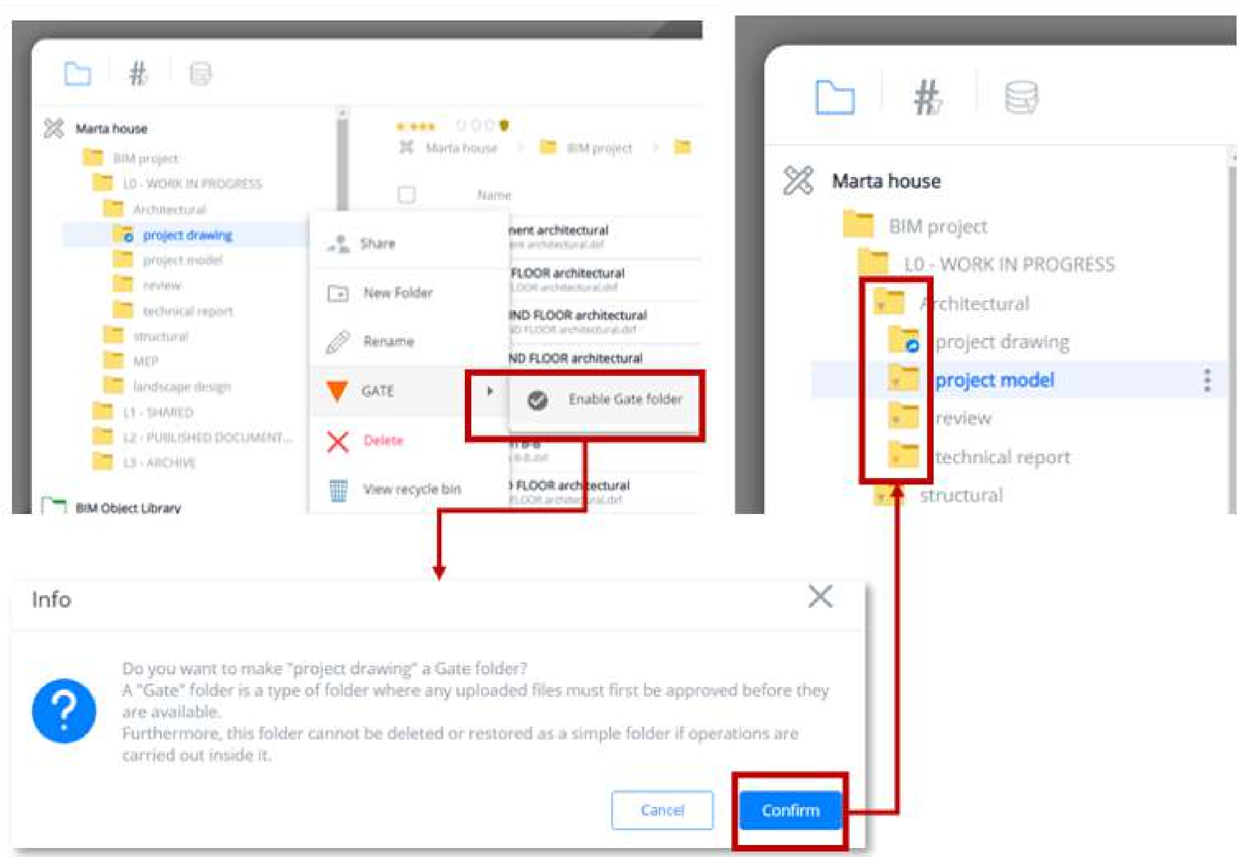

Figure *114. Defining a Gate*

As shown in Figure *114*, the folder with a GATE has a filter for different file types:

- "GATE in": documents blocked in the Gate that must be accepted or rejected

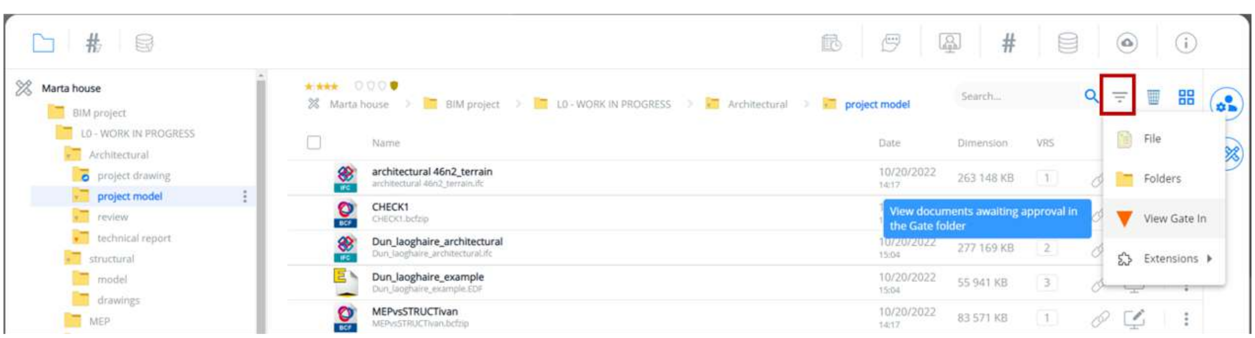

Figure *115. View Gate In*

In the folder equipped with Gate there is also a filter to display only the files in GATE out.

- By clicking on the "Gate out" button, you can filter and see only the documents that have been copied from the current folder in a further destination Gate.

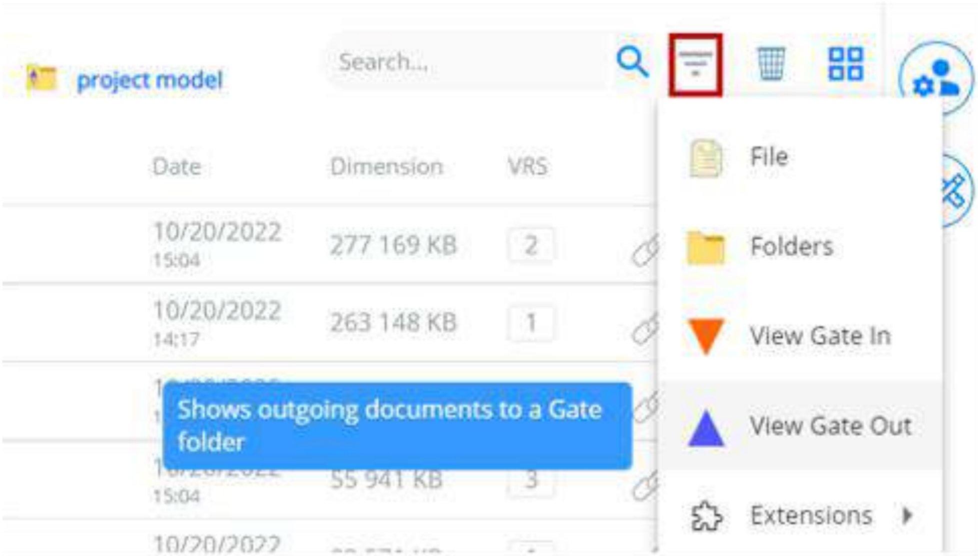

Figure *116. View Gate Out*

As far as the pending document is concerned, you can approve it or reject it, go to the folder, view the document in the browser, and copy the document link, as shown in (arrow 1 Figure *117*). From menu of the document (arrow 2 Figure *117*) you can approve it or reject it, download it to proceed to the verification phase, access the events history and copy the link of the document.

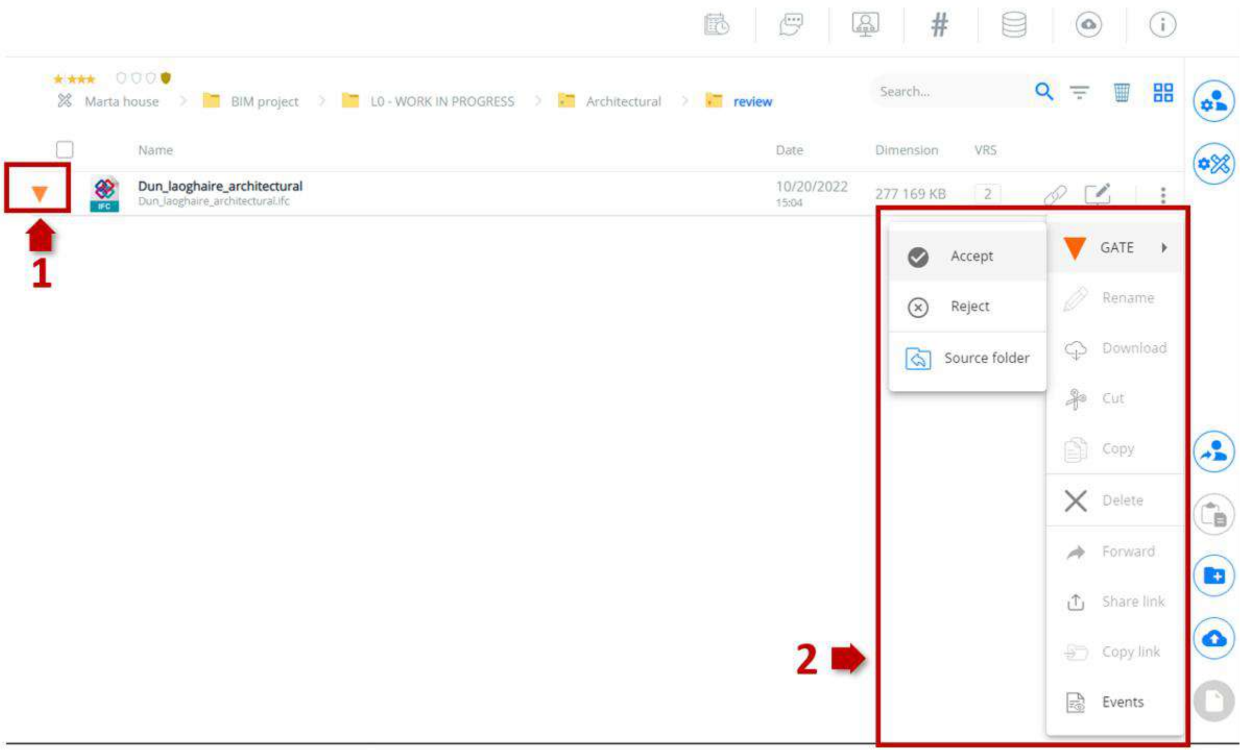

Figure 117. Possible actions on pending documents in the Gate Zone

From the Gate folder menu (Figure *117*), after a multiple selection of the documents, you can approve or reject them, download them to proceed to the verification phase, and access the summary of the information of those documents transited within the Gate.

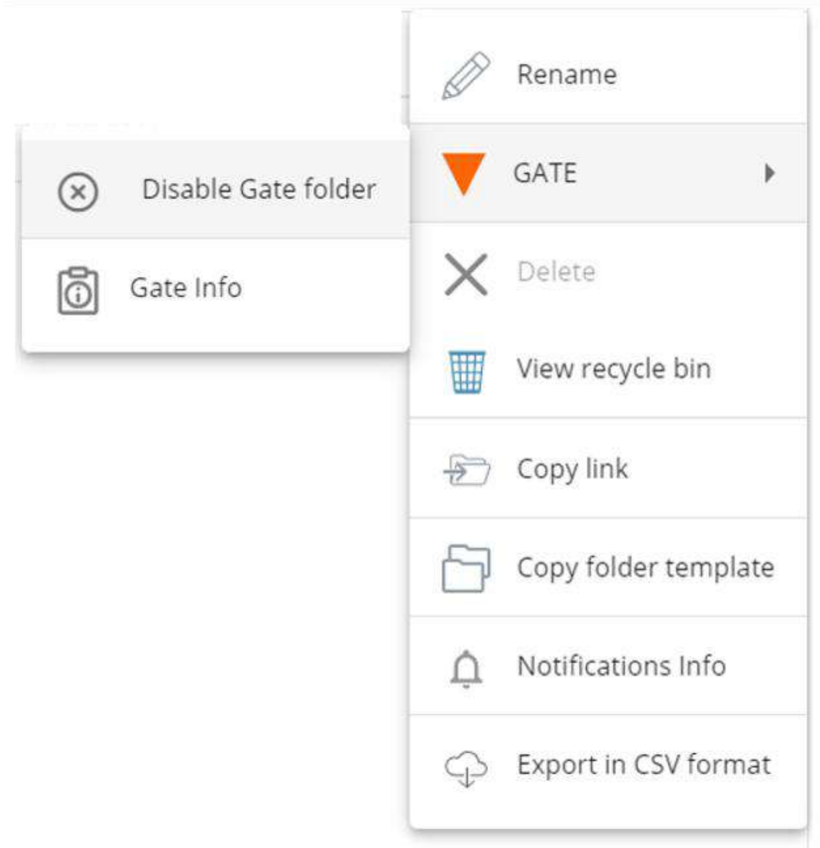

Figure *118. Gate Info*

By clicking on the Information button of the GATE (Figure *118*), you access the section that allows you to view all the information related to the operations carried out in it. Figure *119*Figure *119* From the dialog, you can export the information in .CSV format.CSV (arrow 3 Figure *119*).

Figure *119. Gate Information*

The acceptance or rejection of a document requires to indicate which workflow (concluded) was used (see par. 6.3.6). It is also possible not to indicate any workflow, in which case the user assumes responsibility for the verification outcome.

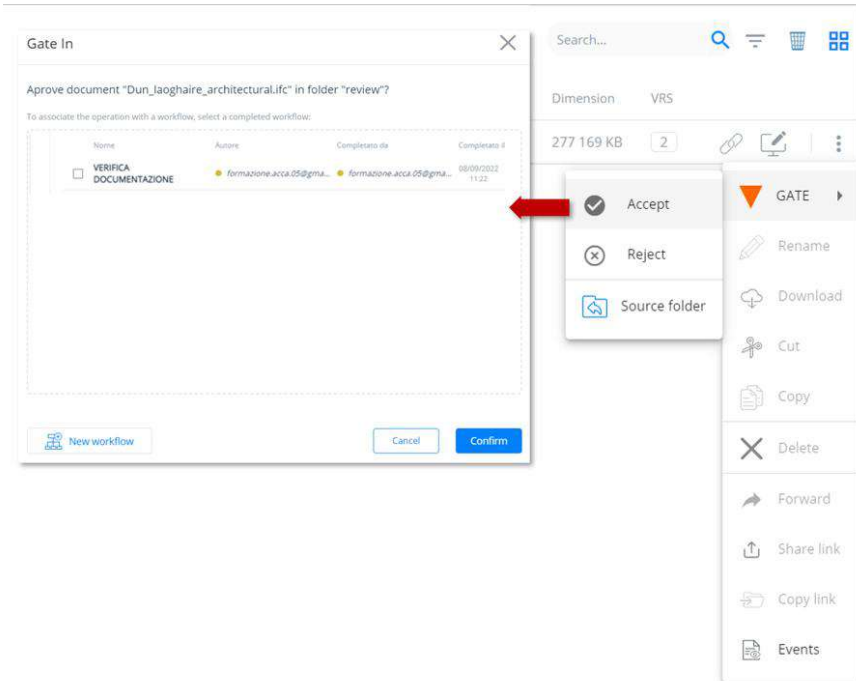

Figure *120. Gate zone: declaration of the used process*

6.3.3 Uploading documents

In usBIM.platform, in order to upload and share documents, there are five operating modes:

- **Drag & Drop:** in this case, you must reduce the usBIM.platform window and drag the documents that reside on your PC into it, after selecting them, by holding down the left mouse button. Figure 121
- **Upload files from PC:** by clicking on the Upload files button (arrow 1 Figure *122*) you must choose the Upload files from PC item (arrow 2 Figure *122*); in the new modal, select the path and, therefore, the folder from which to retrieve the files to be imported into the platform.
- **Upload folder from PC:** by clicking on the Upload files button you must choose the Upload folder from PC item (arrow 3 Figure *122*); in the new modal, select the folder that contains the files to be imported into the platform. In this case, any subfolders with all their contents will also be imported.
- **Capture Media:** in this case it is possible to import files into usBIM.platform by taking photographs, recording videos or audio and saving them directly in the reference folder (arrow 4 Figure *122*).
- **Import from other platforms:** finally, you can import files directly from other sharing platforms (Google Drive, DropBox and One Drive) (Arrow 5 Figure *122*).

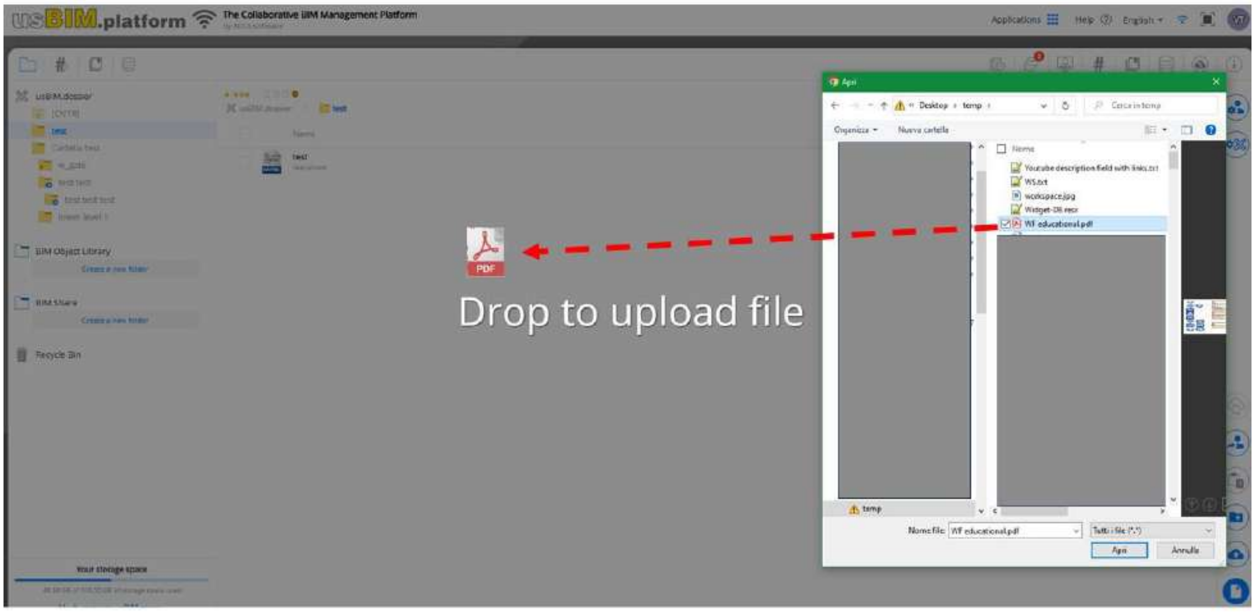

Figure *121. File drag & drop*

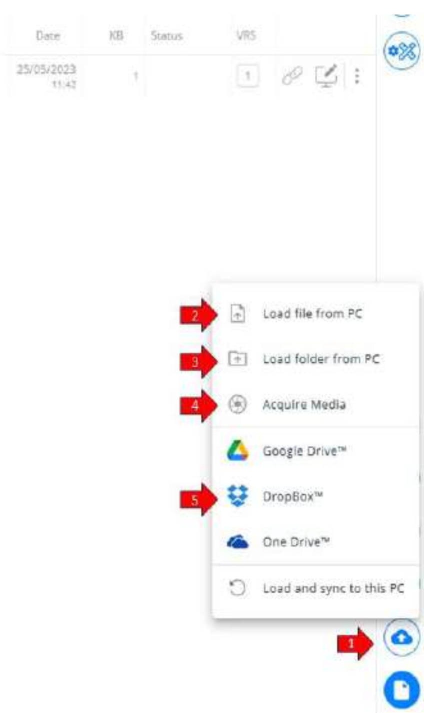

Figure *122. Uploading documents*

6.3.4 Project documents grid

The project documents that are stored within usBIM.platform are displayed on a screen such as the one shown in Figure *123*:

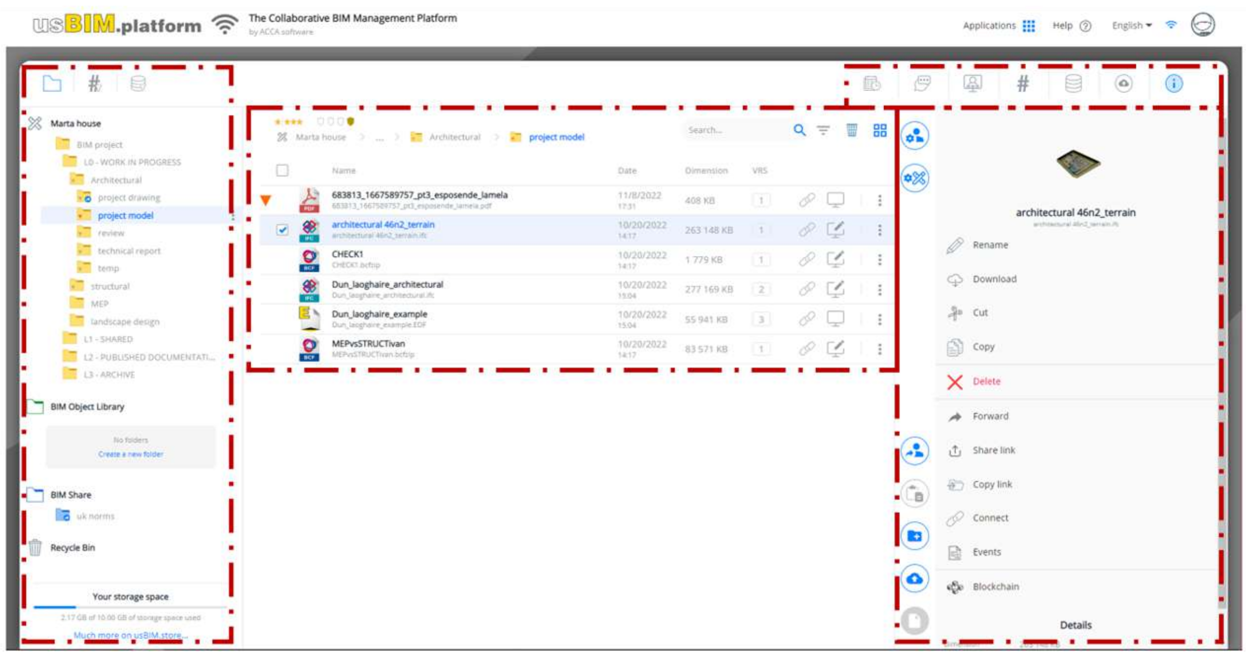

Figure *123. Project Documents Sheet*

In the section on the left, you can view the project structure and filter tabs. In particular, we find the following features (Figure *124*):

[1] Project Folder Structure

[2] Filter Section #TagBIM

[3] usBIM.data Filter Section

[5] Project folders menu

[5] BIM Object Library

[6] BIM Share

[7] Recycle bin

[8] Storage space

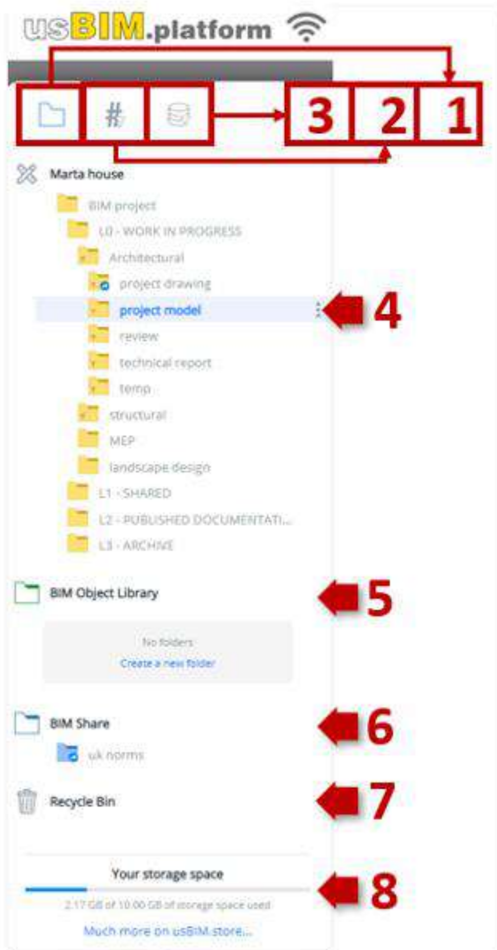

Figure *124. Project Structure*

In the tab at the top right instead we find the following features (Figure *125*):

[1] View calendar

[2] View usBIM.chat

[3] View usBIM.meet

[4] View TAGS

[5] View usBIM.data

[6] View Upload

[7] View details

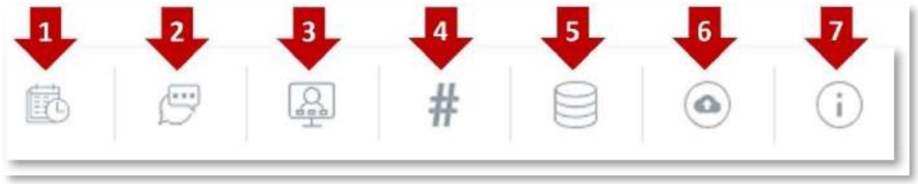

Figure *125. Features available from the top-right menu*

The central area of the page is used for document management

[1] Viewing user permissions in the reference folder

[2] Role of the user in the reference folder

[3] Check box for selecting multiple documents

[4] Check box for selecting a document

[5] Search filter: allows documents to be searched within the selected project folder and its subfolders.

[6] Filters

[7] Recycle bin

[8] Visibility change for the grid of project documents

[9] Drag & Drop for creating links between various documents

[10] Upload date of the active version of the document

[11] Active version of the document: by clicking on the field, you can view the different versions of the document and set a different current version.

[12] Document Viewing/Downloading: for formats managed by usBIM.browser, you can open the document by clicking on the screen icon, while you can download formats not managed directly by usBIM.browser by clicking on the cloud icon.

[13] Document menu: it allows access to possible actions on the document

[14] Workspace User Management

[15] Manage Workspace

[16] Share

[17] Paste

[18] New Folder

[19] Upload file

[20] New Document

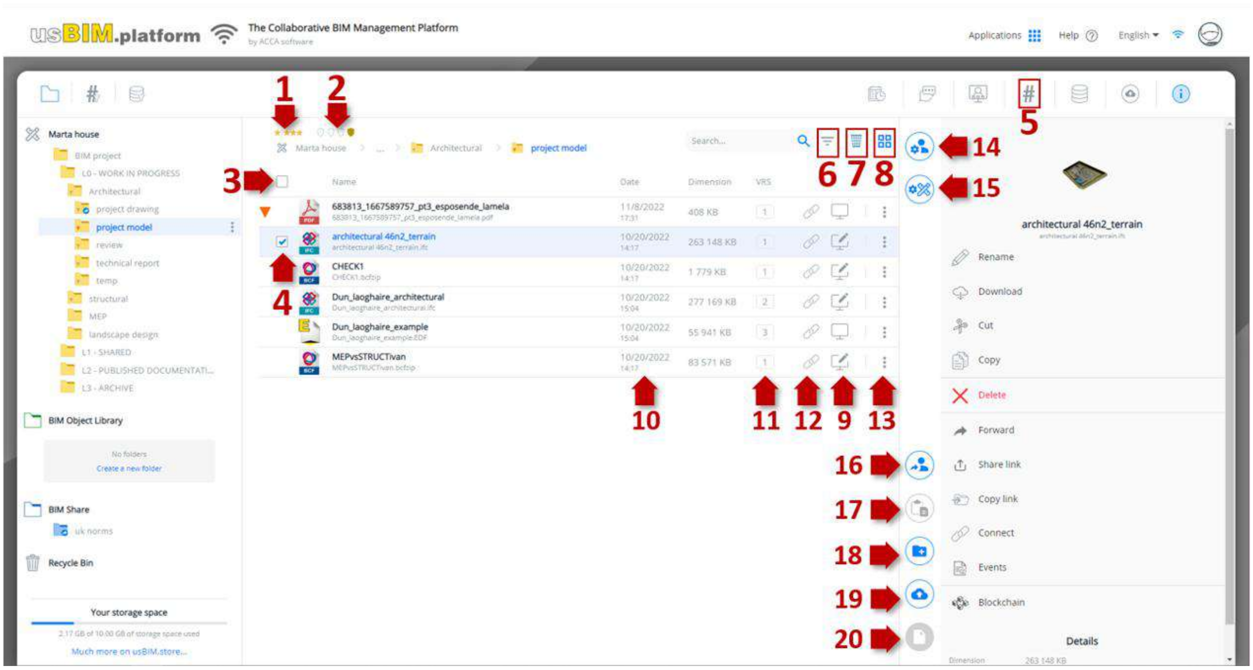

Figure *126. Document management*

6.3.4.1 #TagBIM: structure editing

usBIM.platform provides the #TagBIM functionality to tag documents with structured alphanumeric strings (Tags), so that they can be easily searched and located within the digital platform. It is an open format, as the string can be edited with any text editor and can be interpreted by both the computer and man, stored in any DB and easily managed by any application.

#TagBIMs allow you to input any information about the individual version of the files very freely, and you can add information that also has values, which in turn become grouping and search keys. This string made up of Tags can therefore be seen as the provision of a series of keywords that identify the document uniquely.

The three following #TagBIMs are automatically added to an uploaded document:

- **Extension:** Document file extension
- **User:** User who uploaded the document
- **Date:** When the file was uploaded

You can view the automatic #TagBIMs by selecting the document and clicking on the Tag Editor section as shown in Figure *127*.

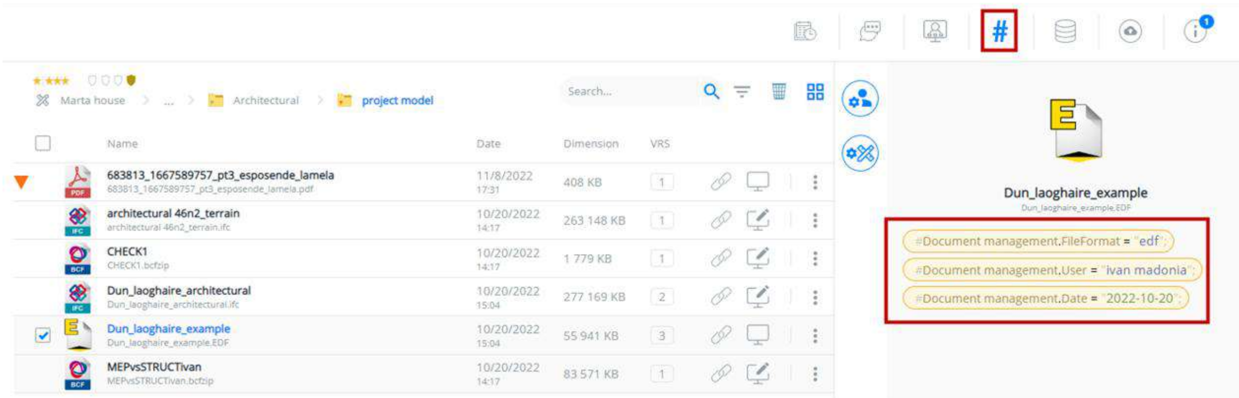

Figure *127.Automatic #TagBIMs*

The #TagBIM feature has two main sections:

- Tag Editor: section for adding a #TagBIM
- Tag Filter: search section of the #TagBIM associated with the documents (see par. 6.3.4.3):
- To add the #TagBIM, simply click on the editor icon indicated with the arrow inFigure *128*.

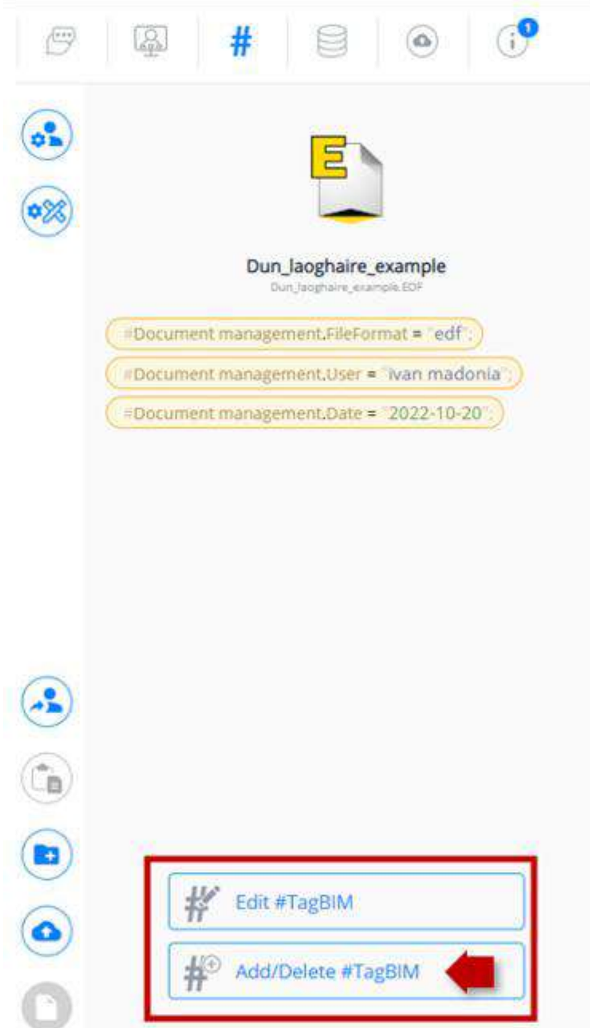

Figure *128. Accessing the Tag Editor*

The window of the Tag Editor will look like in Figure *129*. Using the "Copy" button you can copy the Tags associated with a document and paste them into other documents. To add a new Tag click on "Add": a window will pop up as shown in Figure *130*:

- **Name:** the name of the Tag starts with the # character and can contain all alphanumeric characters only. To create a **group of Tags**, use the [.] point (e.g. #Group.Tag). If you want to separate the words, use the underscore [_] (e.g. #Name_Tag)
- **Tag Value:** the following formats can be used:
    - Text: only alphanumeric characters

- Number: all numbers, plus character [+], minus [-] and period [.] as decimal separators (ex: 9.8)
- Date: the date in the format YYYY-MM-DD (e.g.: 2017-06-30)
- 2D measurement: length and height separated by the asterisk [*] character (ex: 2.5*3.5)
- 3D measurement: length, thickness and height separated by the asterisk character [*] (ex: 2.5*3.5*4.8)
- Link: URL to a web source
- List: multiple values separated by pipe character [|]
- Numeric range: two numbers separated by colon [:] (ex: 99.9:9999)
    - Date range: two dates separated by the colon [:] (ex: 2017-06-30:2019-01-31)

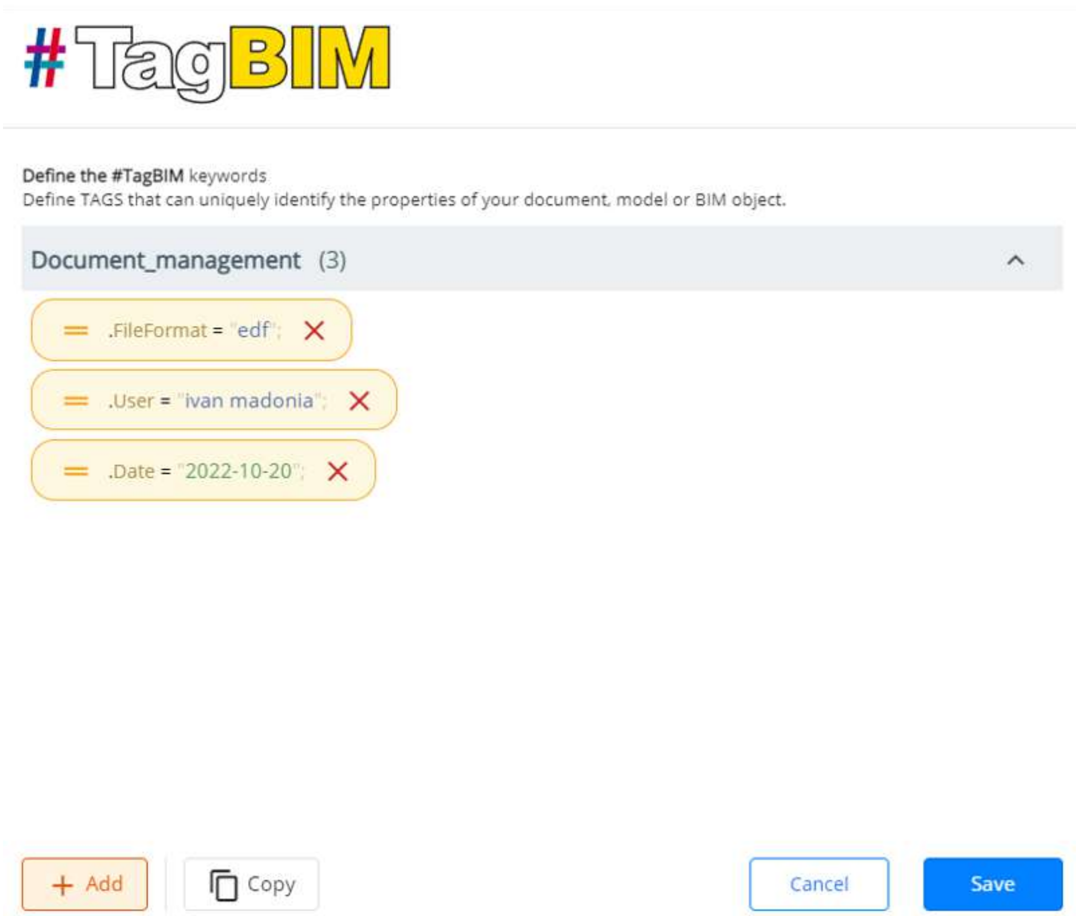

Figure *129. Tag Editor pop-up Window*

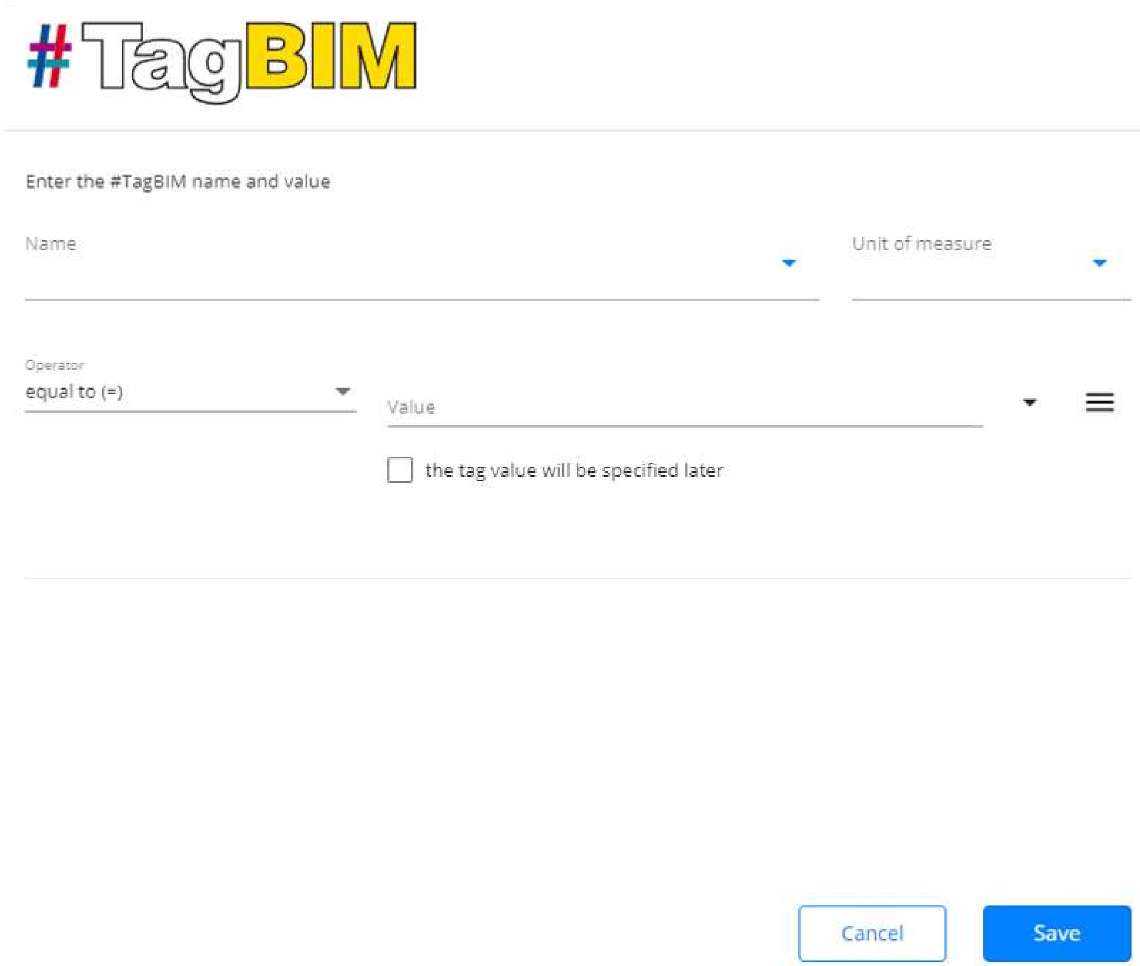

Figure *130. Inserting a new #TagBIM*

Once the #Tag fields have been filled in, you save the changes by clicking on the Save button.

The ability to create a #TagBIM structure on a document is reserved exclusively for users who have a third level permission (View, Upload and Edit.) on the folder in which it was uploaded; the ability to edit the value fields of the #TagBIM structure is also granted to users who have a lower level of permission (View, Upload, View and Upload). When editing the structure of the #TagBIM, it is possible, in fact, to use the option "The tag value will be specified later" (Figure *131*);

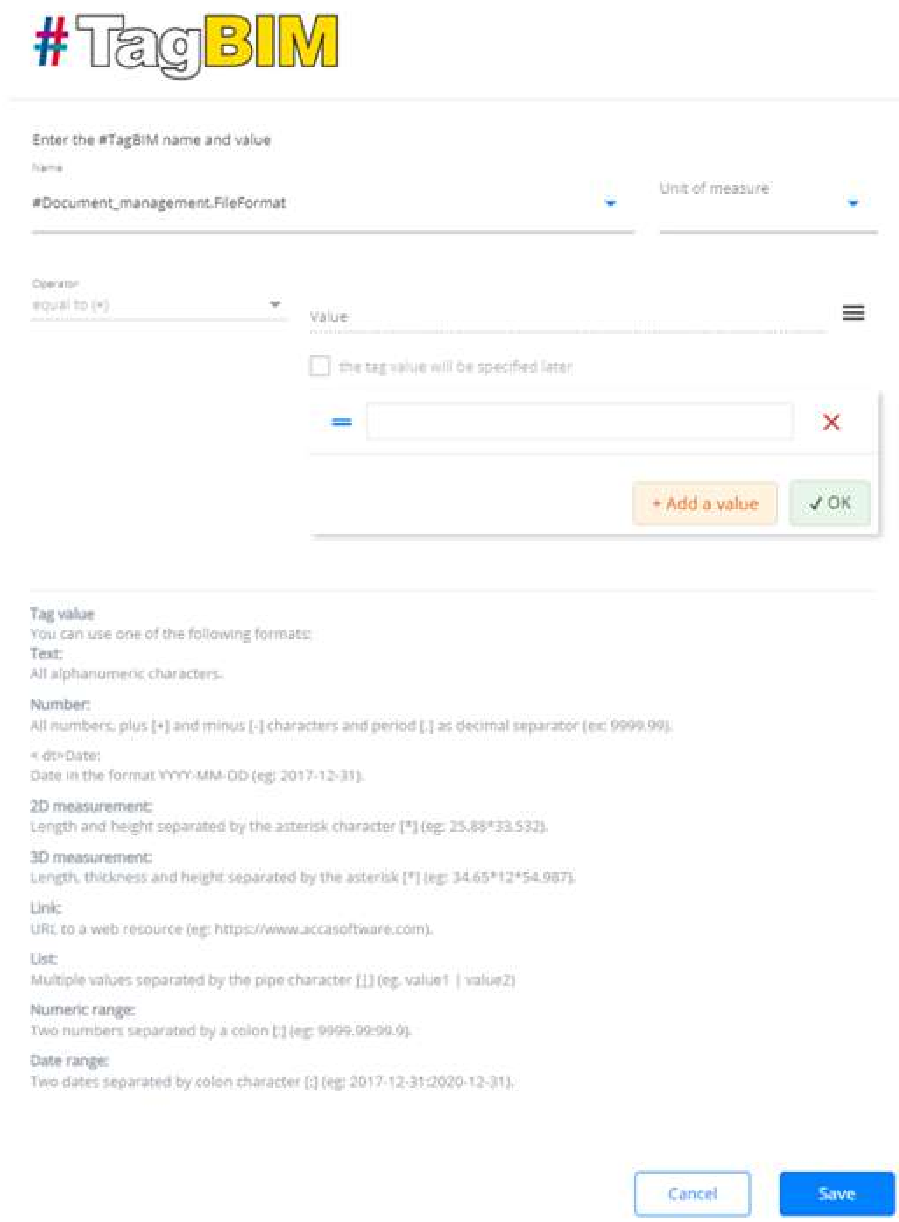

Figure *131. Editing #TagBIM structure*

6.3.4.2 #TagBIM on folder

In addition to the #TagBIM automatically associated with files following their upload to the platform, usBIM.platform allows you to establish tags, to be associated with a folder, which are automatically inherited by all documents uploaded to it.

Select the reference folder (Arrow 1 Figure *132*) and click on the View Tag button (Arrow 2 Figure *132*) Then click on Add/Delete #TagBIM (Arrow 3 Figure *132*) and finally on Add (Arrow 4 Figure *132*). At this point it is possible to add the #TagBIM (see par. 6.3.4.1) on the folder that will be associated with the documents uploaded to it.

The ability to associate #TagBIM with the folder is reserved for the Platform Admin, delegated PA, BIM Manager and Standard User with the View, Upload and Edit permission.

N.B. The value that characterizes the Tag must be entered manually after the completion of the upload phase as it cannot be determined a priori. In fact, this functionality allows you to establish the metadata to be associated but the relative value must be indicated from time to time.

Figure *132. Add #TagBIM to folder*

When associating the #TagBIM on the folder, an icon (Arrow 1 Figure *133*) appears on the folder indicating the existence of at least one folder tag. The files uploaded here therefore have a red string (arrow 2 Figure *133*) indicating the association of the tag but the lack of characterization of the value.

Figure *133.Highlighting folder #TagBIMs*

6.3.4.3 #TagBIM: document filter

The section dedicated to the #TagBIM filter provides the user with the list of #TagBIMs defined during the Editing phase (see par.6.3.4.1). In this way, the same value assigned to the Tag also becomes a search key. This function becomes extremely useful when, at an advanced stage of the work, the number of documents shared in the CDE grows exponentially. Therefore, the use of #TagBIMs and their values will make the documentation sought easier to trace (Figure *134*).

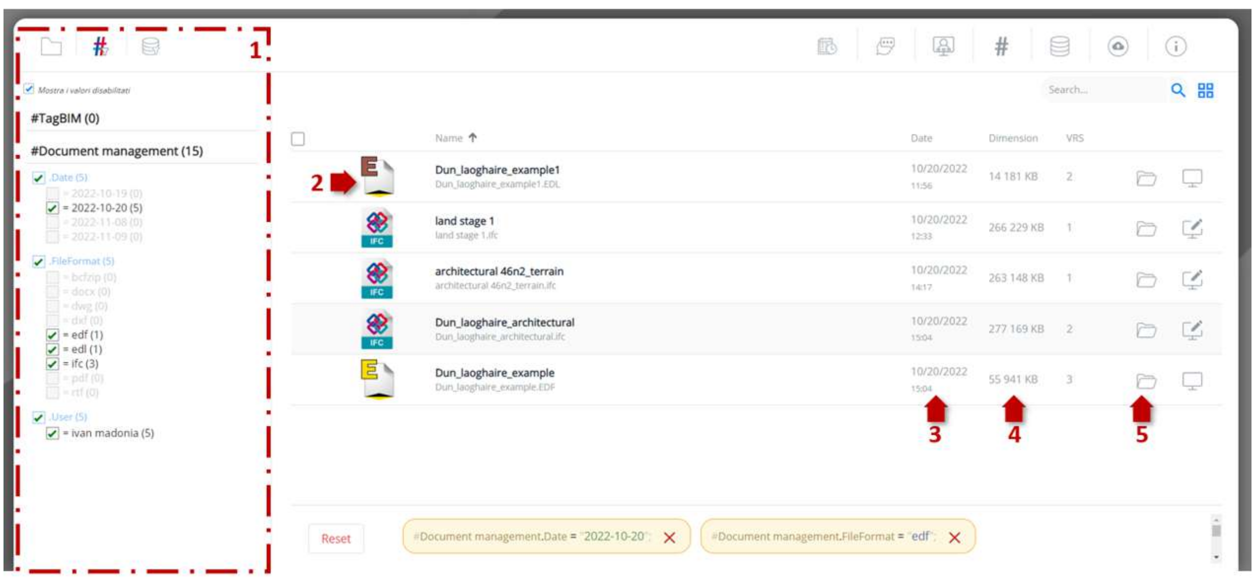

Figure *134. Filter section of the #TagBIM*

[1] List of #TagBIMs

[2] File name

[3] Upload date of the active document

[4] Active version of the document

[5] Go to folder: key opens the folder where the document was uploaded

6.3.4.4 Documents menu

By accessing the menu, you can find the functions that allow you to manage the single document, as shown in Figure *135*:

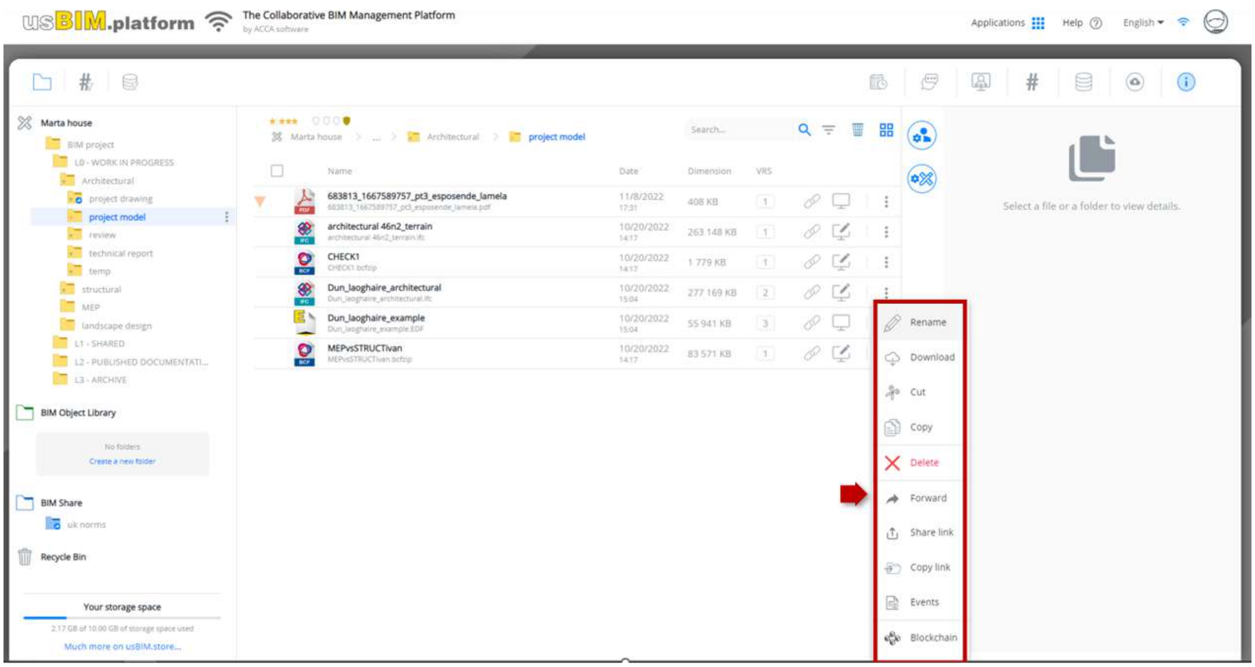

Figure *135. Documents menu*

6.3.4.4.1 Rename

Click on the "Edit" button to change the title (arrow 1) and name (arrow 2) of the document (Figure *136*).

Each file uploaded to the platform is always associated with a double string:

- "File name" which shows the physical name of the file. Then the name typed in during saving is returned through the software that generated that document.
- "File title" refers to the name of the file on the platform. By default the "File Title" corresponds to the "File Name" and is highlighted in bold. The user has the possibility to modify it and, therefore, differentiate it from the "File name" to, for example, make it more talkative (just think of file names that have alphanumeric encodings that are not immediately understandable).

The platform offers the possibility to modify both entries as described above. Obviously, by acting on the "File Name", the physical name of the document will be changed. This means that, in the case of downloads, the downloaded file will show the new name typed on the platform (remember that when downloading locally, the "File name" is always shown only).

To search for documents using the appropriate bar, you can refer to both items.

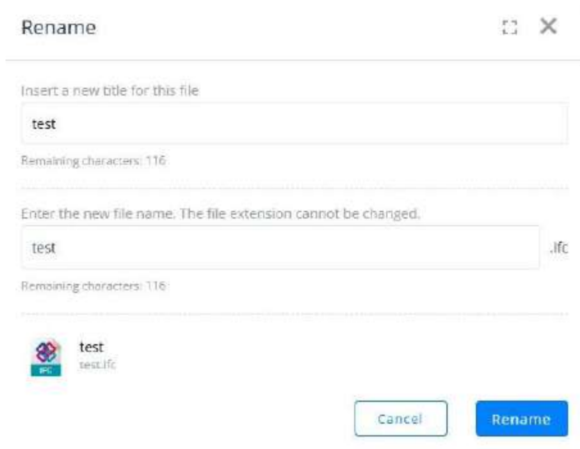

Figure *136. Rename Document*

6.3.4.4.2 Download

Clicking on the "Download" button (Figure *135*) will automatically start the downloading procedure for the file.

6.3.4.4.3 Size

Clicking on the "Cut" button (arrow1

Figure *137*) will trigger a message warning that the file has been selected and is ready to be pasted into a folder.

From the Workspace folder structure, then, select the destination folder of the document to be moved and click on the "Move here" button (arrow 2

Figure *137*). In this case, all versions of the document in the source folder will be moved.

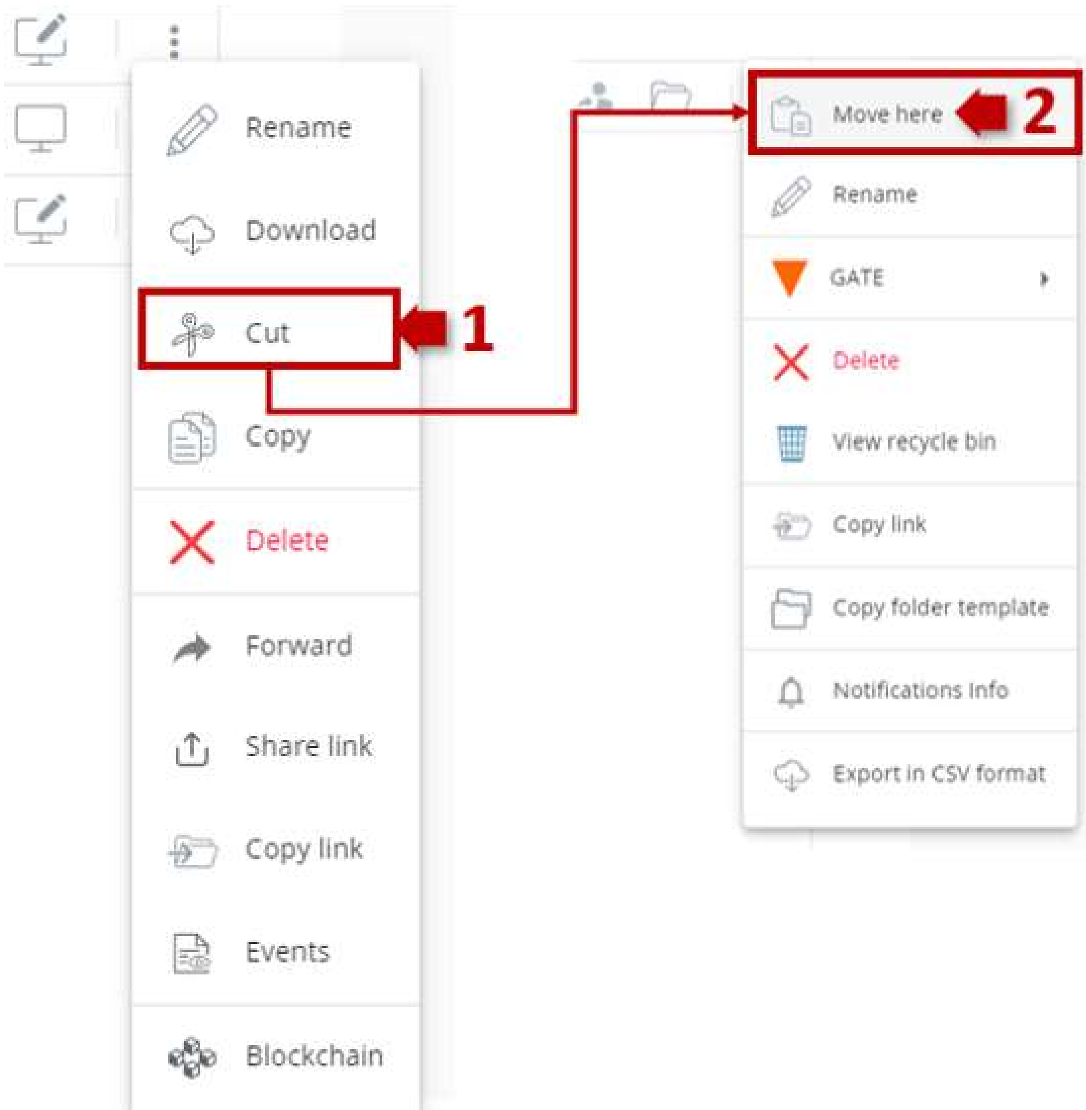

Figure *137. Move Document*

6.3.4.4.4 Copy

Clicking on the "Copy" button (arrow1 Figure *138*) will trigger a message warning that the file has been selected and is ready to be pasted into a folder. To complete the process, click on the "Paste" button in the destination folder menu (arrow 2 Figure *138*). In this case, only the active version of the document in the source folder will be copied. You can copy no more than 10 documents at a time. Remember that if the documents are in a draft state, it will not be possible, in the multiple selection, to copy the documents.

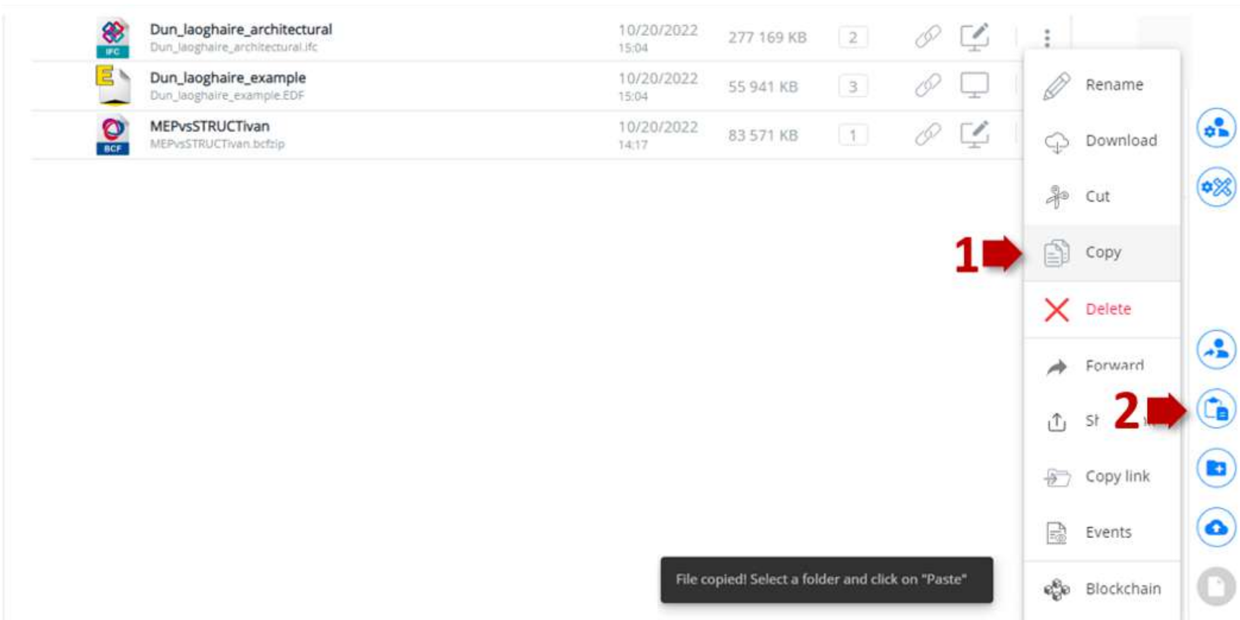

Figure *138. Copy Document*

6.3.4.4.5 Delete

By clicking on the "Delete" button (Figure *135*) you can delete a document uploaded to the platform. The deletion of a document does not consist in a permanent deletion, but rather in moving it to the "Recycle Bin" environment (for further information on the "Recycle Bin" section, please refer to paragraph 6.3.4.6).

6.3.4.4.6 Restore

If a document is deleted, it is moved to folder's recycle bin (see par. 6.3.4.6). By accessing the aforementioned environment (Figure *139*), the user with View, Load and Edit permission, using the "Restore" button (Figure *140*) can restore it to the original folder.

Outside the folder bin, the "Restore" button is disabled.

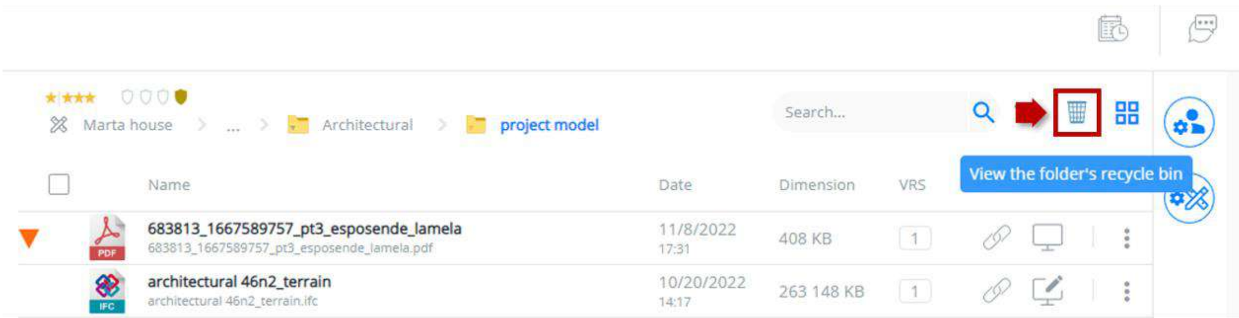

Figure *139. Folder-level access to the Recycle Bin*

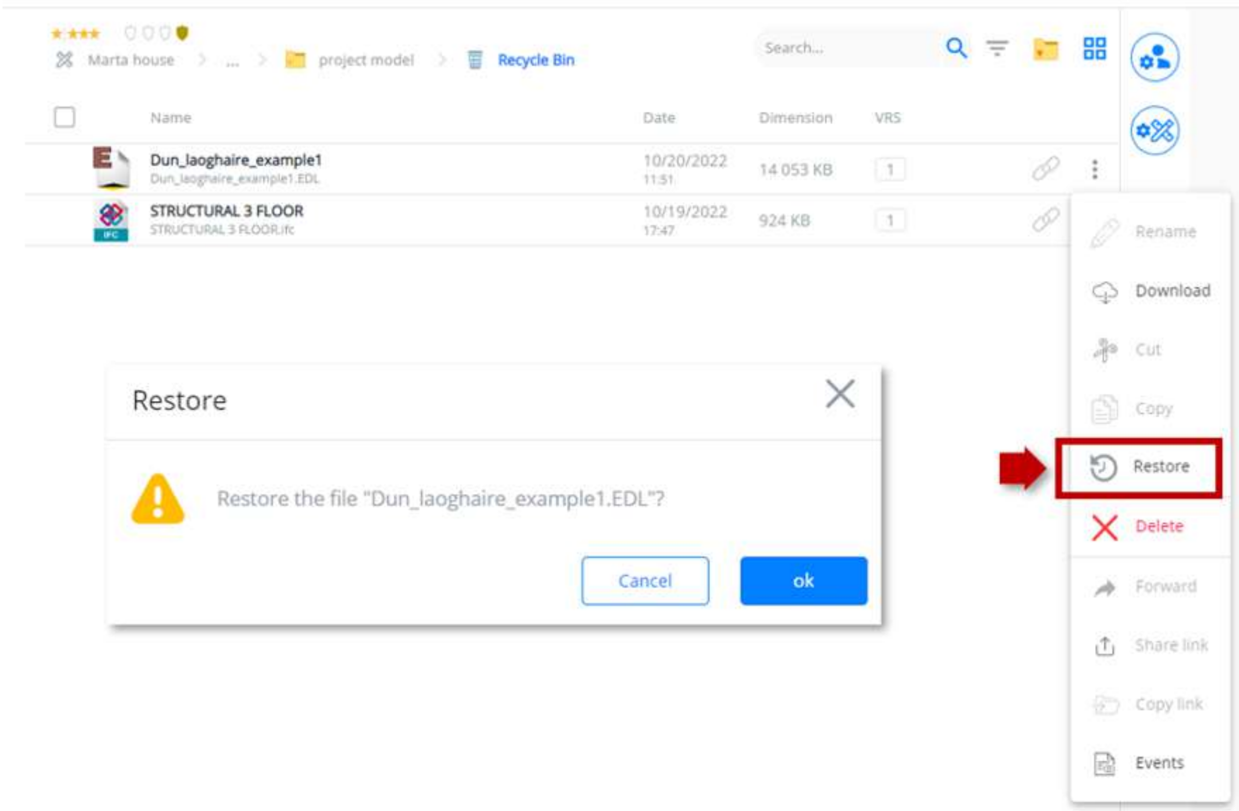

Figure *140. Restoring a document*

6.3.4.4.7 Forward

By clicking on the "Forward" button (Figure *135*), you access a new window (Figure 141) where you can forward the file via usBIM.chat or by email. It is also possible to decide whether to forward it with "Private" permissions, which allows access to attachments to all usBIM.platform users, or "Public", allowing read-only access to attachments to anyone. You should enter the recipient user's email address and an optional message. Finish by clicking on the "Send" button.

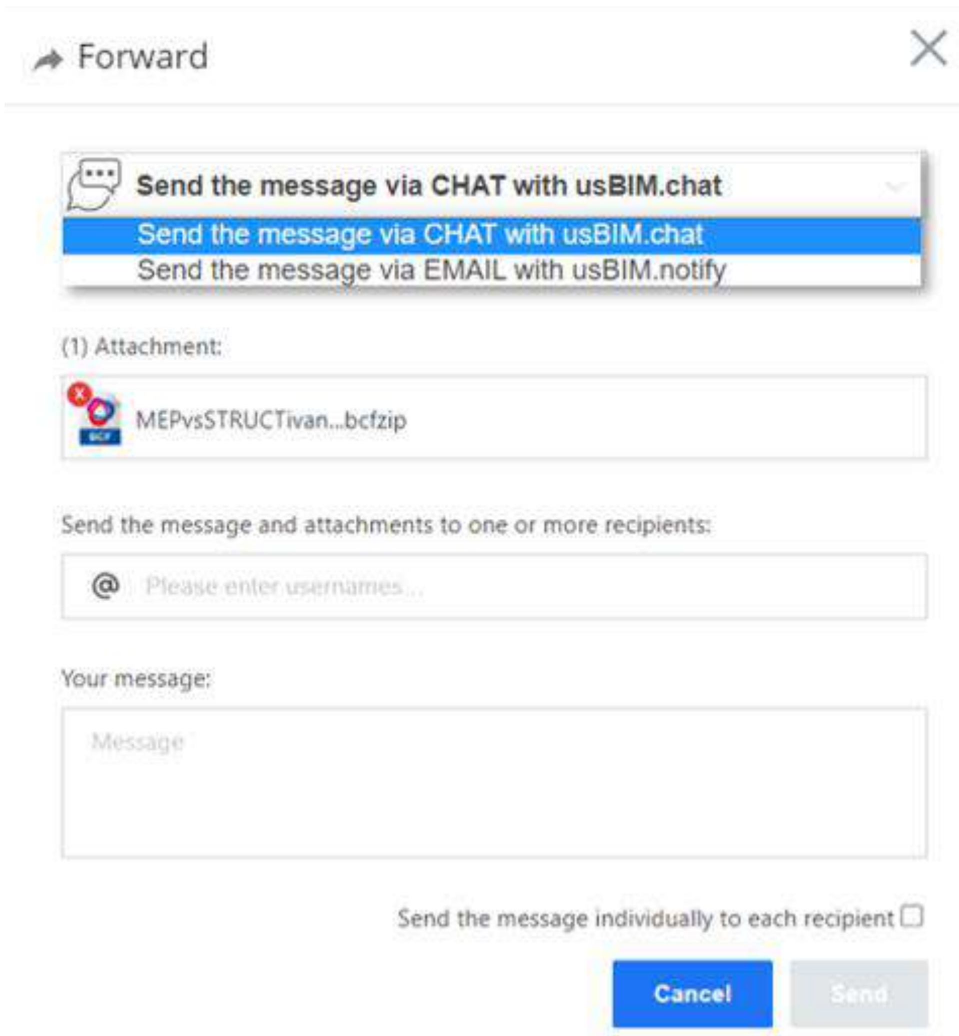

Figure 141. Forward Document

6.3.4.4.8 Share Link

By clicking on the "Share Link" button (Figure *135*) a new window shows up (Figure *142*) where a link to share the document can be created.

Two visibility options can be chosen:

- "Public", (Arrow 1 Figure *142*) which allows you to share the document, in read-only mode, with anyone who receives the link

- "Private", (Arrow 2 Figure *142*) allows you to share the file, in read-only mode, only with those users who have an ACCA account. In this case you have a double option:
    1. create a custom list of users by entering their email address (in this case those not in the list will not have access to the document despite having an ACCA account)
    2. choose to give visibility to the document to all authenticated users with ACCA accounts (arrow 4 Figure *142*)

    For both scenarios, you can set the below:
- "PIN" (Arrow 5 Figure *142*) which allows you to enter a numeric code to protect the file
- "Expiry date" (arrow 6 Figure *142*), after which the link will no longer be available

The viewing permission is set by default for both options, but the latter can also grant a download permission that allows you to download the shared document (arrow 7 Figure *142*).

Once the fields have been filled, you can generate a hyperlink by clicking on the "Create link" button (arrow 8 Figure *142*), or download a file containing an interactive link and a QR code to access the document.
<u>Please note: a document in the "Edit" status cannot be sent via link (the document must be consolidated).</u>

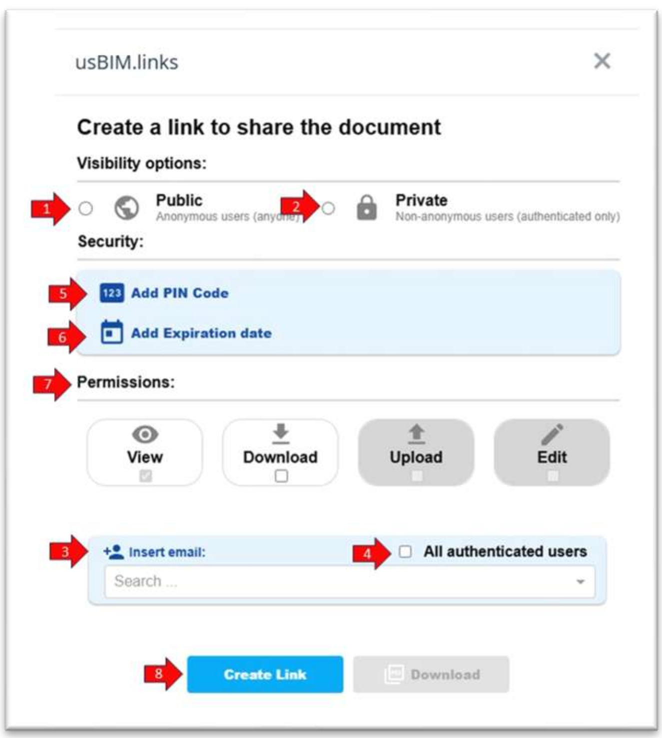

Figure *142 Share Link*

6.3.4.4.9 Copy document link

By clicking on the "Copy link" button (Figure *135*), as in paragraph 6.3.1.9, the URL of the document is copied to be attached through usBIM.browser. For example, to an IFC model, to one of its entities or, again, to a PDF document.

6.3.4.4.10 Events

By clicking on the "Events" button (Figure *135*) you can access all the history concerning that document and the processes it underwent, reporting a trace of what happened to its various versions. For more information on the Events, please refer to paragraph 3.7.

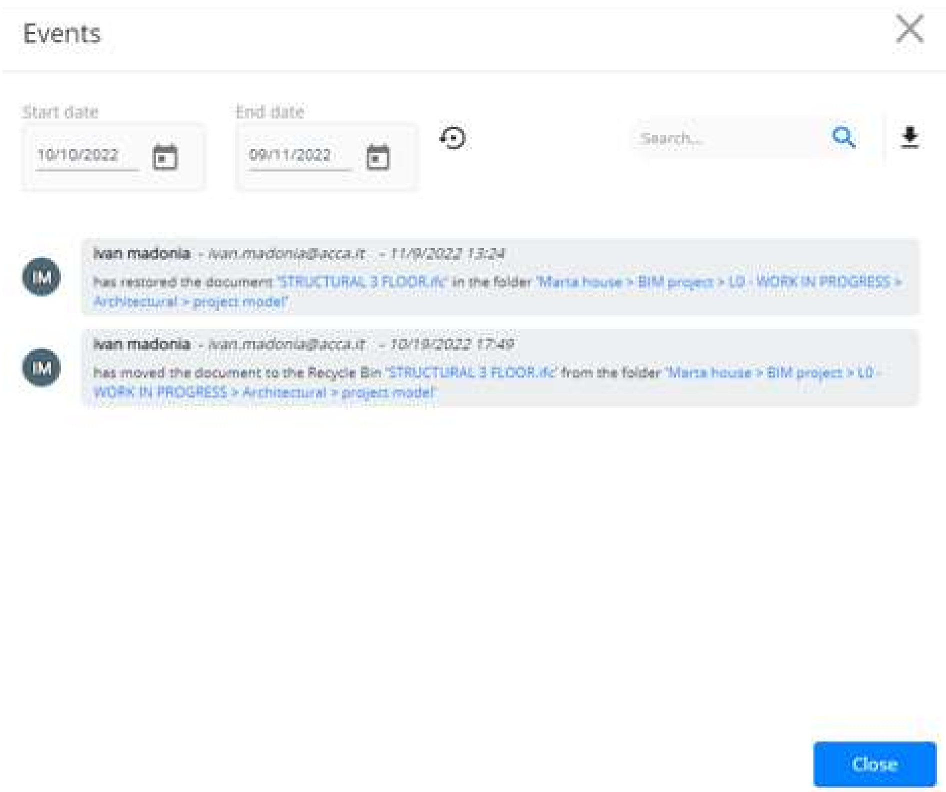

Figure *143. Events*

6.3.4.4.11 Digital signature [eliminare]!!!!!!!!!ELIMINATA!!!!!!!!

By clicking on the "Digital Signature" button (Figure *135*) you can digitally sign the document. !!!!!!!!!ELIMINATA!!!!!!!! This will open a new modal window (Figure *144*), the procedure automatically downloads the file so that it can be signed with your Digital Signature device, after which the signed file will be automatically uploaded to the Platform. !!!!!!!!!ELIMINATA!!!!!!!! Digital Signature is a subscription application available to users who activate the license.

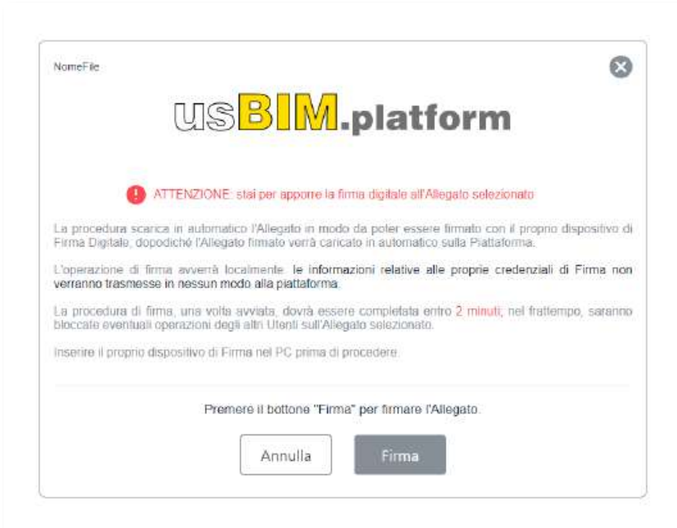

Figure *144. Digital Signature of Document !!!!!!!!!ELIMINATA!!!!!!!!*

6.3.4.4.12 Blockchain

Clicking on the "Blockchain" button (Figure *135*) a new window (Figure *145*) shows up to record the file on the Bitcoin blockchain with the aim to guarantee document authenticity and information immutability over time. Blockchain is also a subscription application available to users who activate the license.

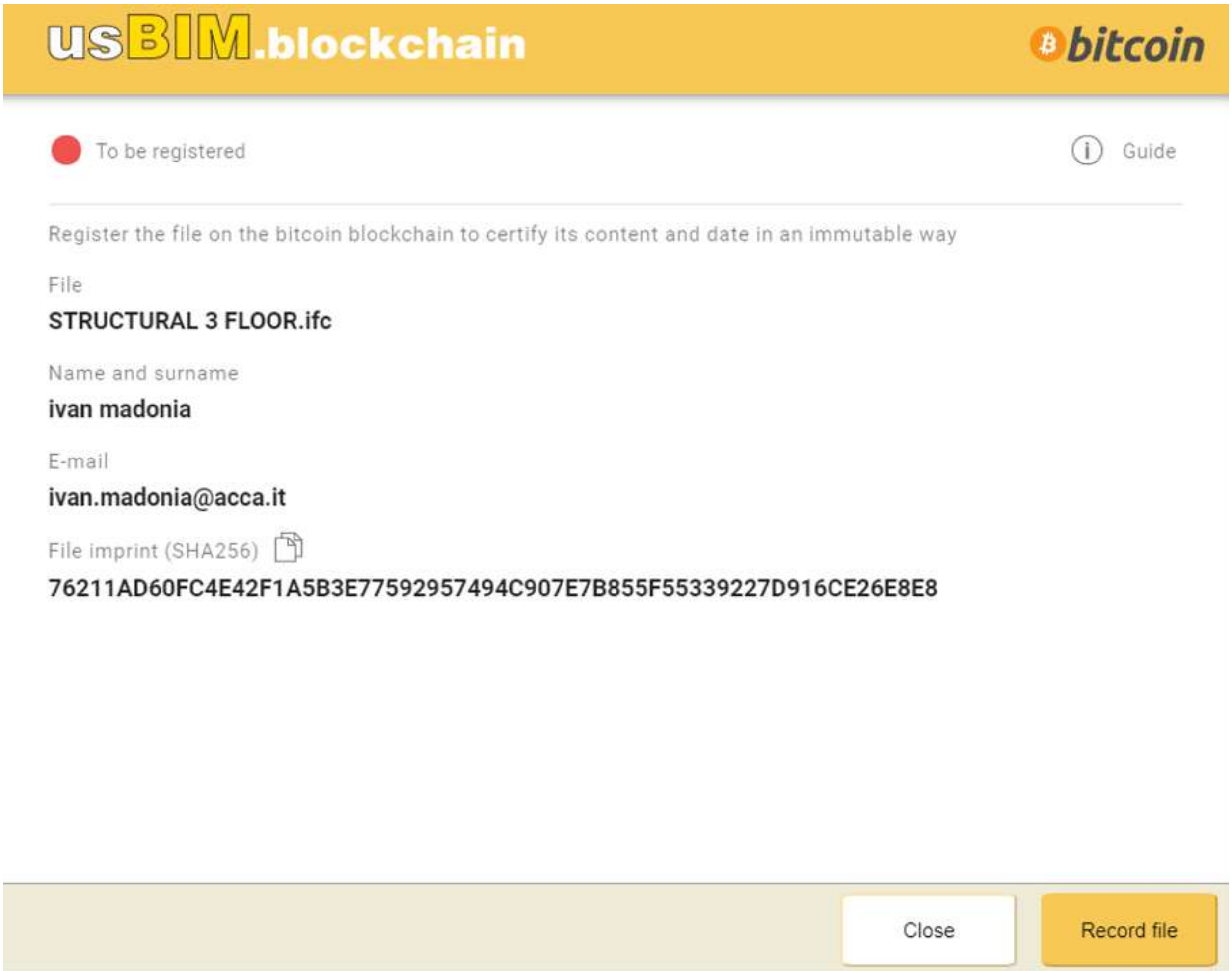

Figure *145. Blockchain*

6.3.4.5 Document versioning

By clicking on the number in the VRS column, you access the list of versions of the document uploaded to the platform. Essentially, you can view the history of all the versions of a document and set, as current, a version that is different from the active one. A window will open up as shown in Figure *146* with the below items:

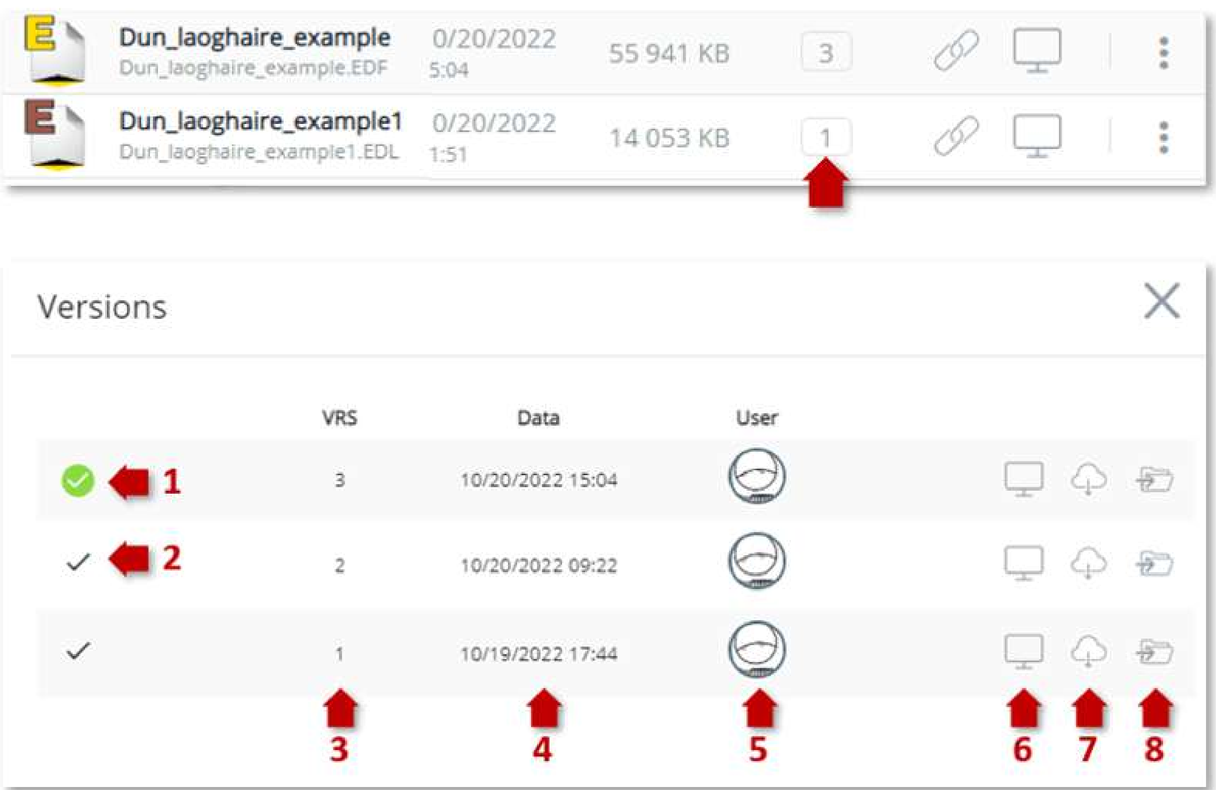

Figure *146. Document versioning*

[1] **Current version**: active version of the document

[2] **Set as current**: command to set the selected document as current

[3] **VRS**: progressive numbering indicating the version of the document

[4] **Date**: date and time of document upload

[5] **User: User**who uploaded the document to the platform

[6] **View**: command to display the supported formats in usBIM.browser

[7] **Download**: button to download the document

[8] **Copy Link**: copy the link of the document and use it in usBIM.browser

6.3.4.6 Recycle Bin

The use of usBIM.platform Recycle Bin is organized through two different levels:

- **Recycle bin at folder level**: in this case, the recycle bin is at the same level as the folder (Figure *148*) from which you delete the contents.
- **Workspace Recycle Bin**: higher-level bin that contains all the files that are deleted from your folders and that are also removed from the folder level's bin.

Figure *147. Accessing the Recycle Bin*

Inside the Recycle Bin (Figure *148*), when you are at the folder level, you can restore the documents by selecting the file, clicking on the thrr dots menu, and selecting the "Restore" option.

Figure *148. Recycle Bin at Project Folder Level*

Files in the workspace recycle bin can be permanently deleted by entering a temporary password (Figure *149*). After this operation, the document can no longer be retrieved.

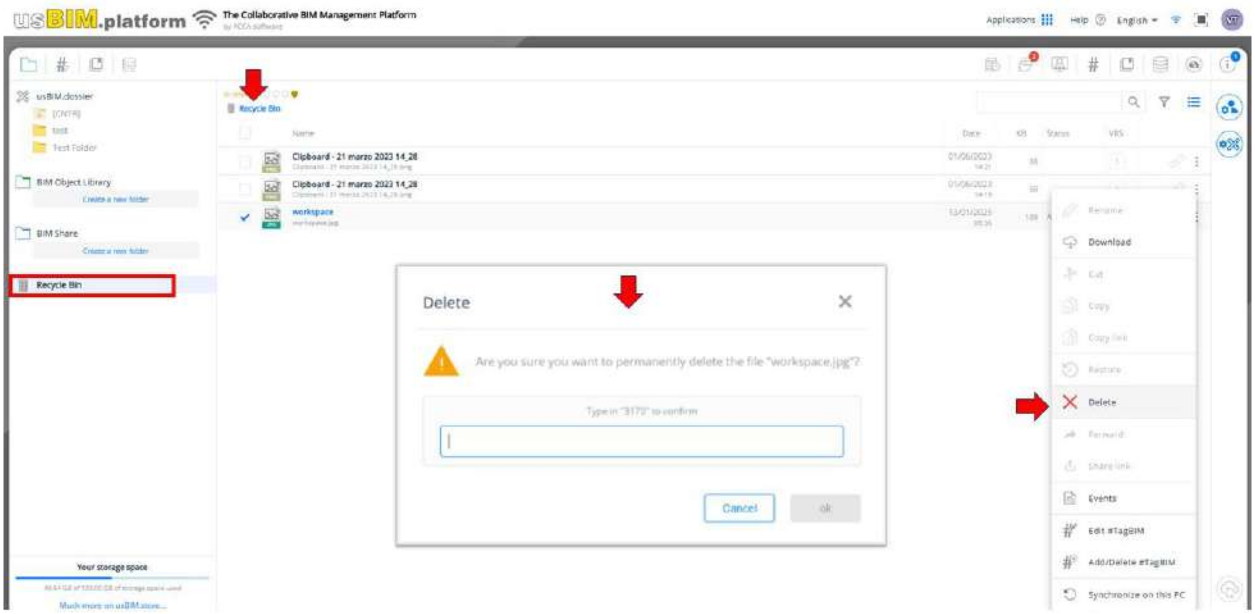

Figure *149. Permanent document deletion*

6.3.5 BIM share: use

Project users, within this sharing area, will only be able to view the documents (arrow 1 Figure *150*) and then retrieve all the documentation shared by the Platform Admin and the Platform Admin delegate at subscription level. If the file extension is supported by usBIM.browser, the document will be visible directly online (arrow 2 Figure *150*), otherwise it will be possible to download it (arrow 3 Figure *150*).

Figure *150. BIM Share*

6.3.6 Document status

The statuses can be customized at the individual workspace level, within the project just click on the manage workspace button, indicated by arrow 1 (Figure *151*), and access the status management (arrow 2 Figure *151*).

The management of the statuses at this level can be managed by the Platform Admin, its delegates and the BIM Project Manager.

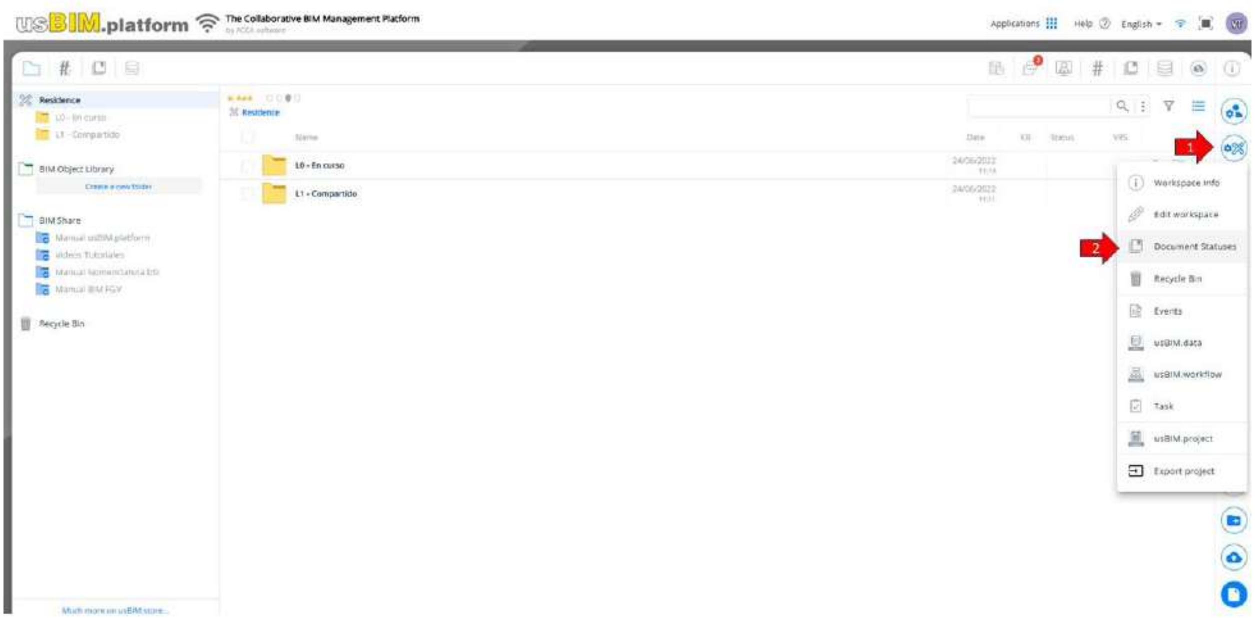

Figure *151. Document statuses in the workspace*

In the new modal, by clicking on the Enable button (Figure *152*) you have the possibility to customize the list of statuses starting from those defined at the subscription level.

Figure *152. Enable document statuses*

Once the statuses have been inherited, you can modify the list by adding a new one, entering a name and clicking on the + button (Arrow 1 Figure *153*), replacing those already assigned (Arrow 2 Figure *153*) or deleting them (Arrow 3 Figure *153*).

To disable the document status management at the workspace level, click on the Disable button (arrow 4 Figure *153*), this operation is only possible if the statuses have not been associated with the documents.

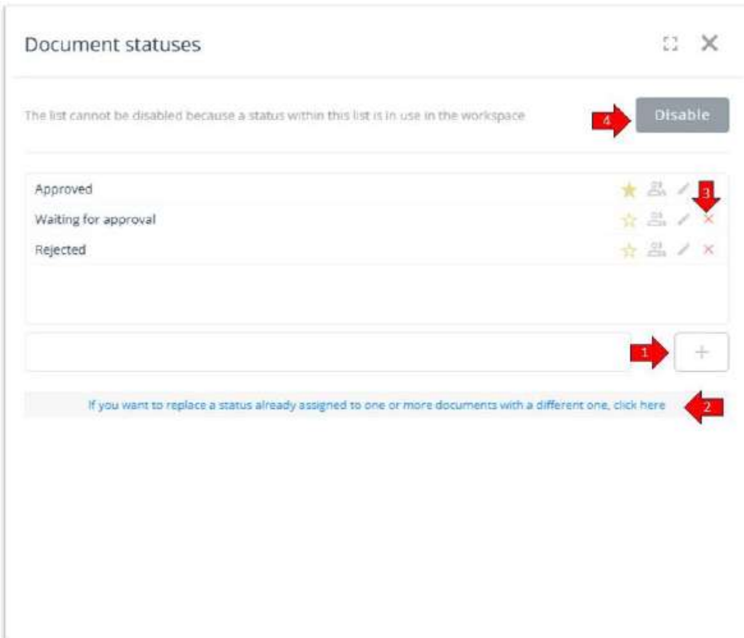

Figure *153. Document statuses editor*

To associate the statuses, select the document (Arrow 1 Figure *154*) and access the editor section of the workspace by clicking on the View document statuses button, (Arrow 2 Figure *154*). From here we choose which status to associate, while if there is a need to modify or add new statuses, you can access the editor window by clicking on the status management (arrow 3 Figure *154*). The statuses can be associated by the Platform Admin, its delegates, the BIM Project Manager and the standard user with the View, Upload and Edit permission.

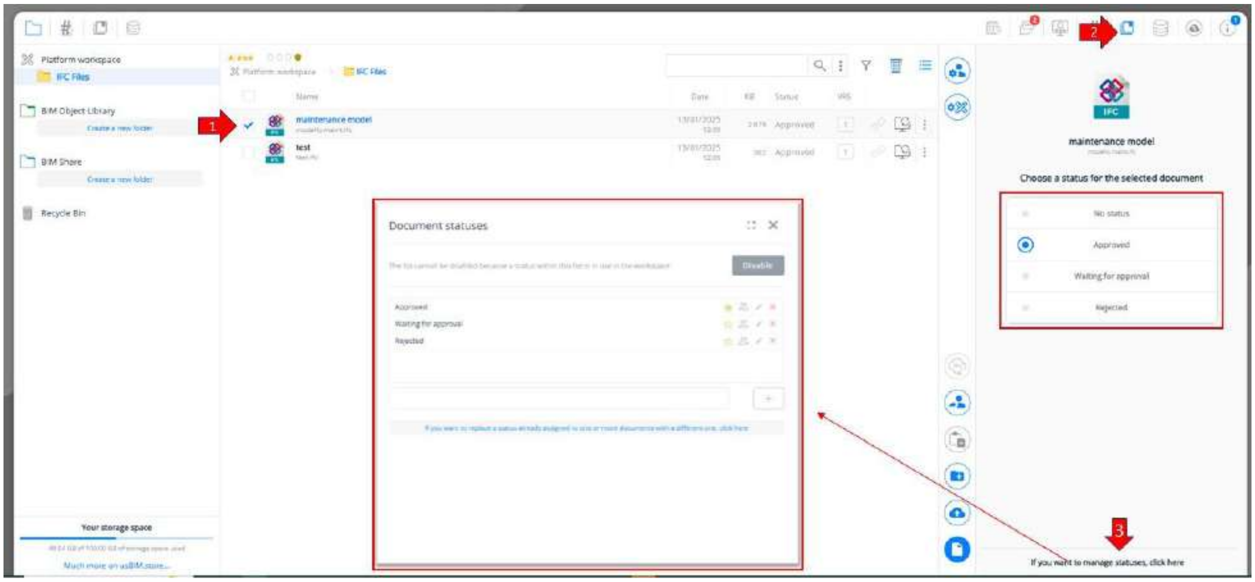

Figure *154. Association of the status with the document*

6.3.6.1 Document statuses filter

The section dedicated to the status filter provides the user with the list of statuses defined and associated with the document (Figure *155*). In this way, the value assigned to the document becomes a search key; this function becomes useful when, at an advanced stage of the work, the number of documents shared in the CDE grows exponentially. Therefore, the use of #TagBIMs and their values will make the documentation sought easier to trace.

Figure *155. Document statuses filter section*

[1] List of states

[2] File name

[3] Upload date of the active document

[4] Active version of the document

[5] Go to folder: key opens the folder where the document was uploaded

6.3.7 Editable formats

As already specified, usBIM.platform allows you to upload and share any type of document. Through the usBIM.browser viewing service, many of these documents can be viewed on the platform and can be associated with new information (for example with links and #TagBIMs).

Some documents can also be createt, viewed and edited directly in usBIM.platform.

Editable documents are divided into two groups, specifically:

- Free Editable Documents
  - GIS map of usBIM.gis *(creates a new GIS map in .geojson format)*
  - BCF file (BIM Collaboration Format) of usBIM.bcf *(creates a new BCF file in .bcf format)*
  - TEXT document or usBIM.writer TEMPLATE *(creates a new TEXT document or HTML TEMPLATE in .whtml format)*
  - Federated document *(creates a federation of templates in .fdrn format)*
  - Word document *(creates a new document in .docx format)*
  - PowerPoint Presentation *(creates a new presentation in .pptx format)*
  - Excel document *(creates a new document in .xlsx format)*
- Paid editable documents
  - UsBIM.clash document *(creates a Clash Detection in .clsh format)*
  - UsBIM.checker document *(creates a new document for BIM validation in .chkr format)*
  - bSDD Document *(creates a bSDD buildingSMART Data Dictionary file in .bSDD format)*
  - IDS Editor Document *(creates a new IDS buindingSmart Information Delivery Specification fileIDS)*
  - usBIM.compare document *(create a new BIM model comparison in .cmpr format)*
  - Fire Safety document *(create a new fire safety registry)*
  - Certus Document *(create a new .dsf2 formaty safety plan)*

- **Architectural Design Document** *(creates a new Edificius document in .edf format)*

The editable documents of the second group are activated if you have the service license.

6.3.7.1 Creating a New Document

In order to create a New Document, you must select the "New Document" icon (Figure *156*).

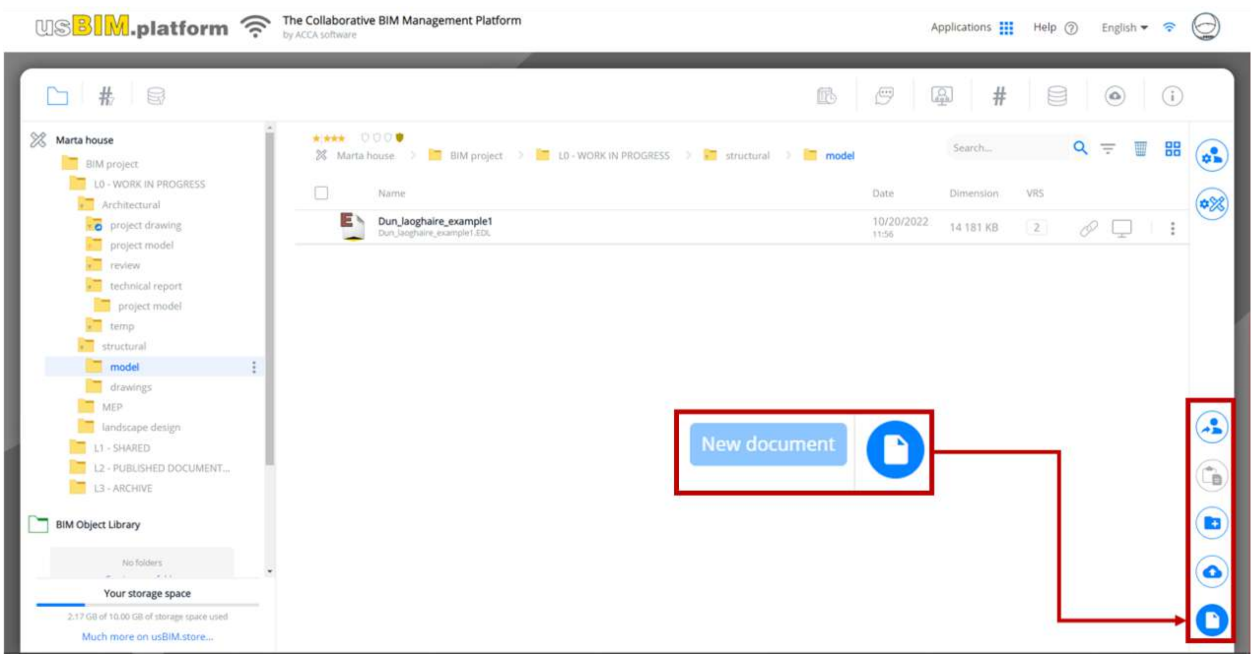

Figure *156. New Document*

A popup window will require to choose a document to be created from those available (arrow 1 Figure *157*). At this point, it will be necessary to add a name to the file (arrow 2 Figure *157*) and the Title (arrow 3 Figure *157*) and then click on the "Create" button (arrow 4 Figure *157*).

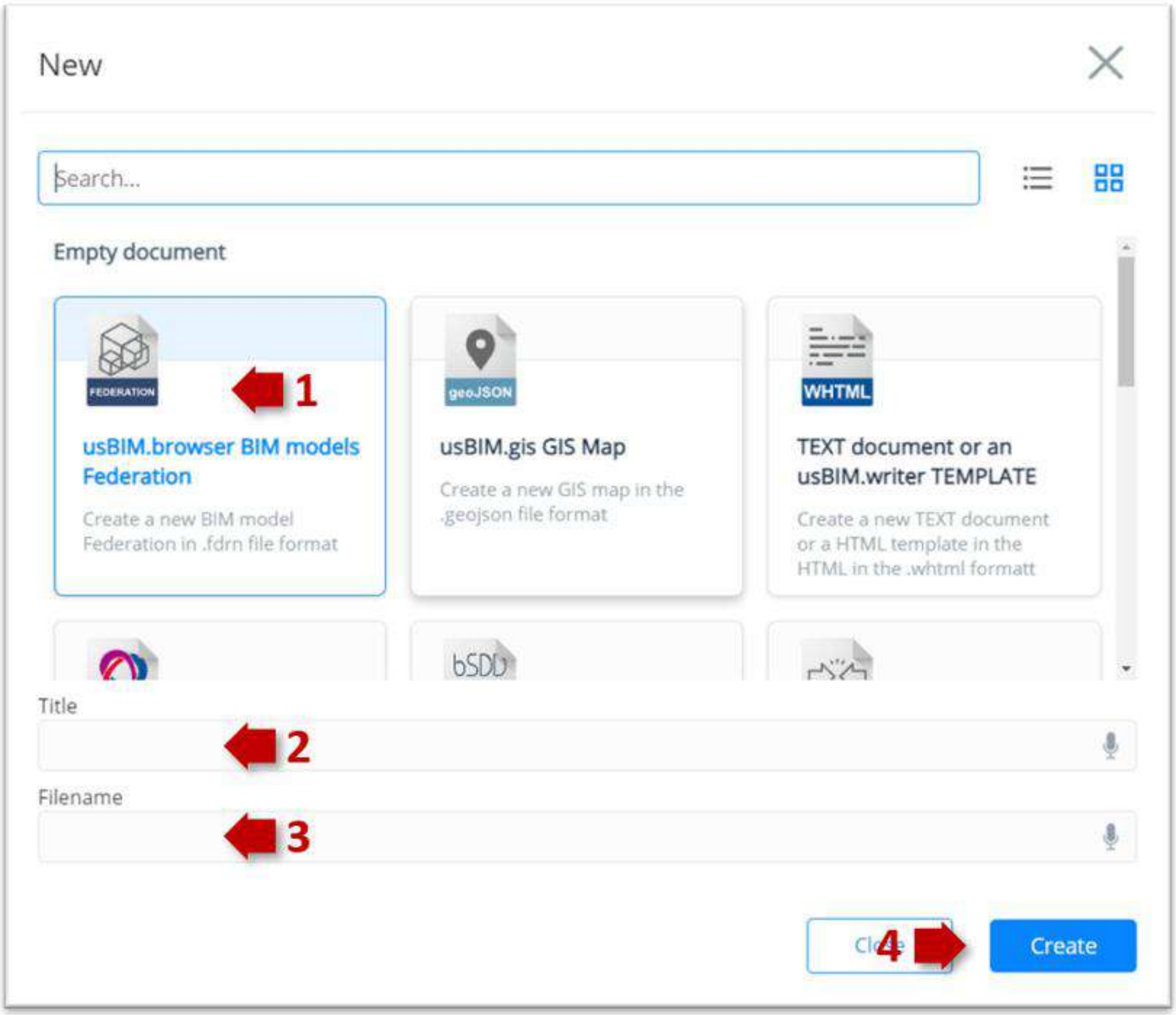

Figure *157. Create a new document*

When a document is created, it is in "Draft" status.You can edit it using different features that vary according to the type of document and close it when finished. When you finish editing, you can close the document. ELIMINARE To open it again, click on the icon shown in (Figure *158*) showing the draft status.

Figure *158. Open Document*

At this point there are three possibilities (Figure *158*):

- Edit: this option allows you to enter the editor and continue working on the document that is still in draft.
- Consolidate: this option allows you to consolidate a version with the current contents of the document. This will generate a further version of the document. In fact, immediately the number 1 will appear in the VRS column (version) in the document grid (see par.
- Help: this option allows you to view clarifications regarding the possibilities described above.

6.3.7.2 Edit Document

For all those documents uploaded to the platform in the formats indicated in the paragraph, 6.3.6 it is possible to edit the current version. Therefore, by clicking on the screen icon (Figure *158*), two options (Figure *159*) are presented:

- Open: it opens the document in its current version in read-only status.
- Edit: puts the selected document in the "Draft" status meaning that it can be further amended.
- Consolidate: creates a new stable version of the file
- Restore: Deletes all changes made to the draft document, bringing it back to the latest consolidated version.

The document editing service allows simultaneous editing by multiple users connected to the same process for some of the services listed above, specifically:

- Map of usBIM.gis
- Federated Document

- Word Document
- PowerPoint slides Laboratory protocols
- Excel Document
- Viewing usBIM.clash document
- Viewing usBIM.checker document
- Viewing usBIM.com document

For other editable documents, the editing service does not allow simultaneous editing by multiple users connected to the same process. However, you can proceed as described below: if a document is open in draft mode, which means that it is being edited, it can be viewed simultaneously by another colleague but with no editing options enabled. By pressing F5 on the keyboard, the second colleague will refresh the document page view. When the colleague closes the draft, the user will have the editor functions active again and will be able to continue the work.

Once the document has been put in the Draft mode, the user can perform the operations described above (Figure *158*).

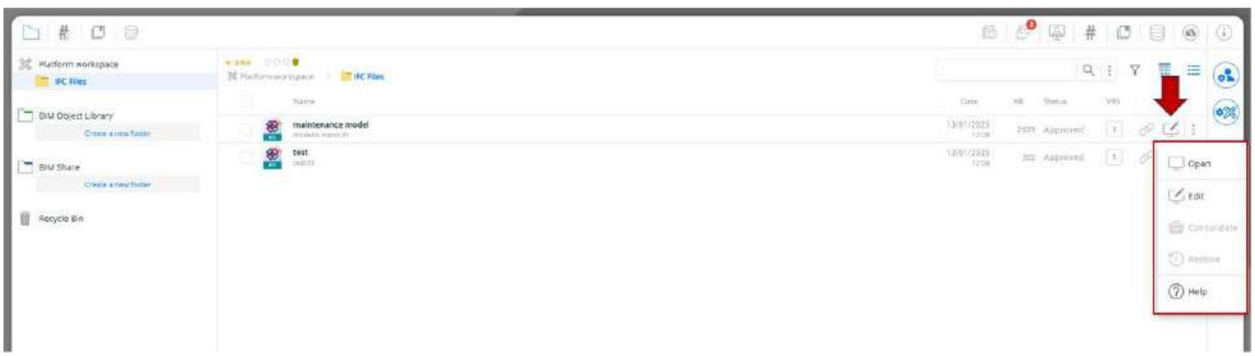

Figure *159. Open version 1*

6.3.7.3 Read-only status

The read-only status on a document is present whenever any user accesses through the "Open" function, regardless of the state in which the document is ("Consolidated" or "Draft").

In the event that access to the document is made by a "PA", "PA Delegate","BIM Manager" or "User with editing permission", the features described in paragraphs 5.4.2 and will be possible6.3.4.1.

The document is opened, instead, in read-only mode by all standard Users with the permission to "view" and/or "Upload". Once the document is accessed, it is not possible to perform any operation, among those listed below (Figure *160*):

- Managing the layer structure

- Adding #TagBIMs
- Linking Documents

Figure *160. Read-only document (user V+U)*

6.3.7.4 Managing permissions on editable formats

The Platform Admin, the Platform Admin Delegate and the BIM Manager can interact with all editable formats and in all project folders as per indications provided in the previous chapters.

Standard users, on the other hand, can create a New Document and edit it only according to the permission granted. More specifically, the User who has permission to

Loading:

- cannot creat a new document
- cannot see a document created by colleagues
- can edit, delete, consolidate documents uploaded by them

Display:

- cannot creat a new document
- cannot edit, delete, consolidate documents
- can open a document in read-only mode even if the document is in draft

Viewing and Loading

- cannot creat a new document
- cannot edit, delete, consolidate documents
- can open a document in read-only mode even if the document is in draft

Viewing, Uploading and Editing

- can create a new document
- can edit, delete, consolidate documents

These options refer to the folder where the permission is granted.

6.4 Information management: use of workflows

6.4.1 Project Workflow

Creating a new project workflow is for subscription administrators (Platform Admins and Platform Admin Delegates) and project administrators (BIM Managers) only.

By accessing the context menu "Manage workspaces" (arrow 1 Figure 161) we find the section dedicated to "Project Workflows". To access the workflows related to the Workspace in question, simply click on the usBIM.workflow icon (arrow 2 Figure 161).

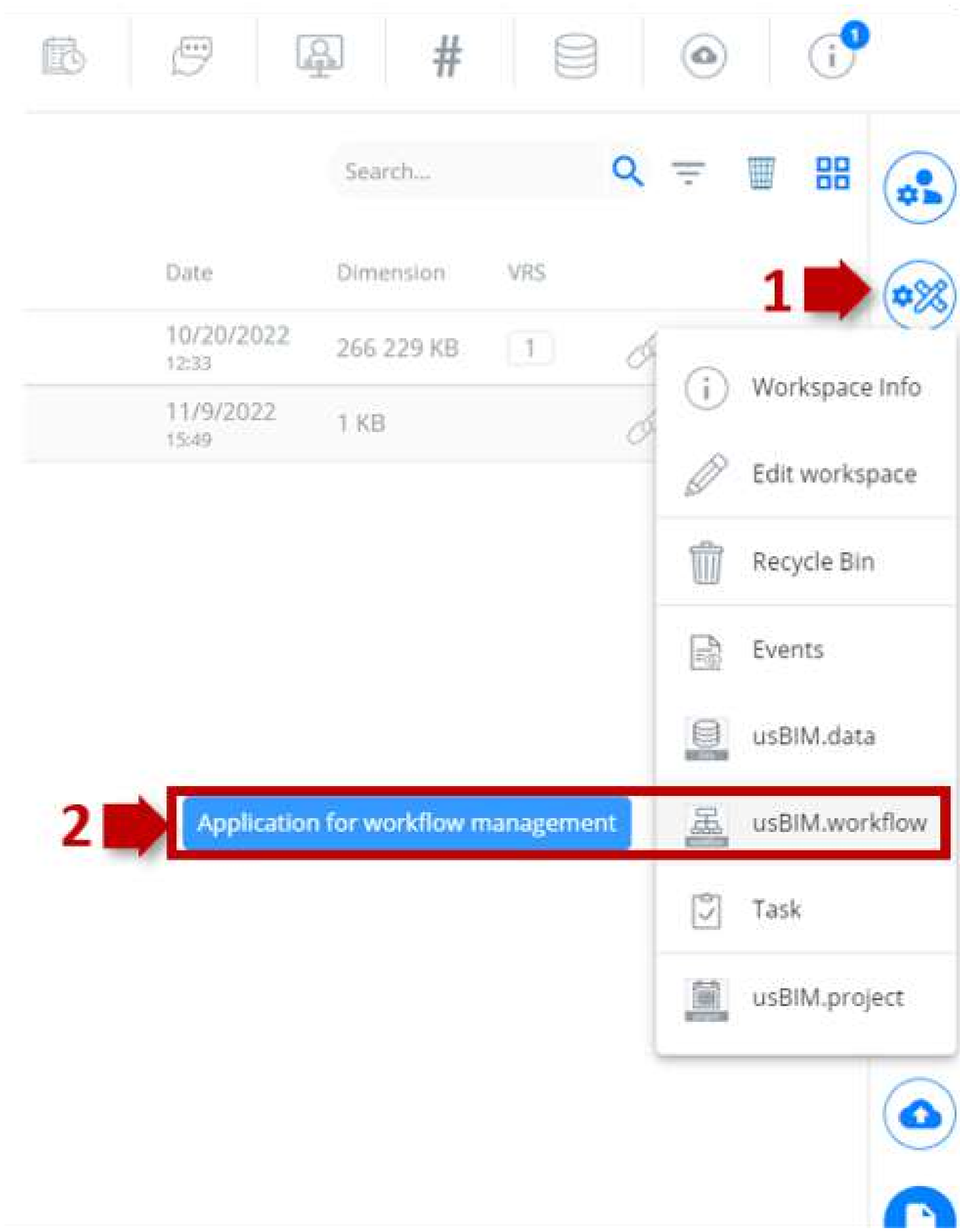

Figure *161. Project Workflow Section*

To create a new workflow directly on the project, click on the "Workflow" button (arrow 1 Figure 162). Then click on the hamburger button (arrow 2 Figure 162) and select the "Project Workflow" option (arrow 3 Figure 162).

Figure *162. New Project Workflow (a)*

In this section, click on the "New Workflow" icon (Figure 163) and a pop-up will show the two ways to add a new workflow (see par. 4).

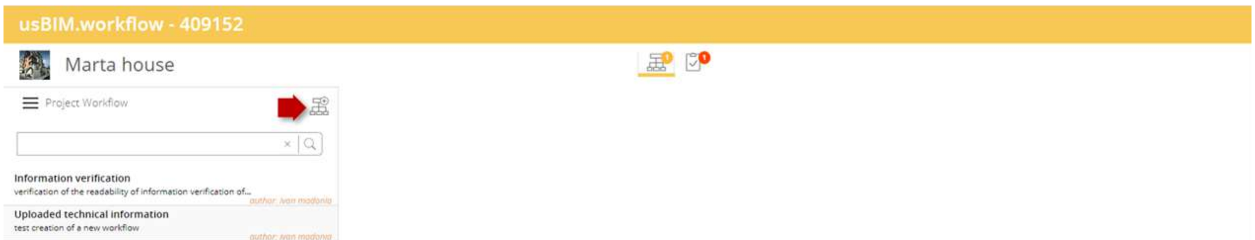

Figure *163. New Project Workflow (b)*

6.4.2 New Workflow

If you create an "empty Workflow", a modal window will open up requiring a name and a description for the new workflow. After filling in the required fields for the creation of the process, click on the "Save" button. From this point, it is possible to follow the procedure described in the "Subscription Workflow" section (see par. 4.2.1.1). Use "Task Properties" to modify information, add permissions and add annotations (see par. 4.2.1.2).

By clicking on the "Add comment" button (arrow 1Figure 164) available in both "WORKFLOW Properties" and "Task Properties", you can upload a project folder, a project file or a new file (arrow 1Figure 165). Through the "Request confirmation" option (arrow 2 Figure 165) it is possible to request that the user completing the task confirms that they have carried out what indicated in the annotation.

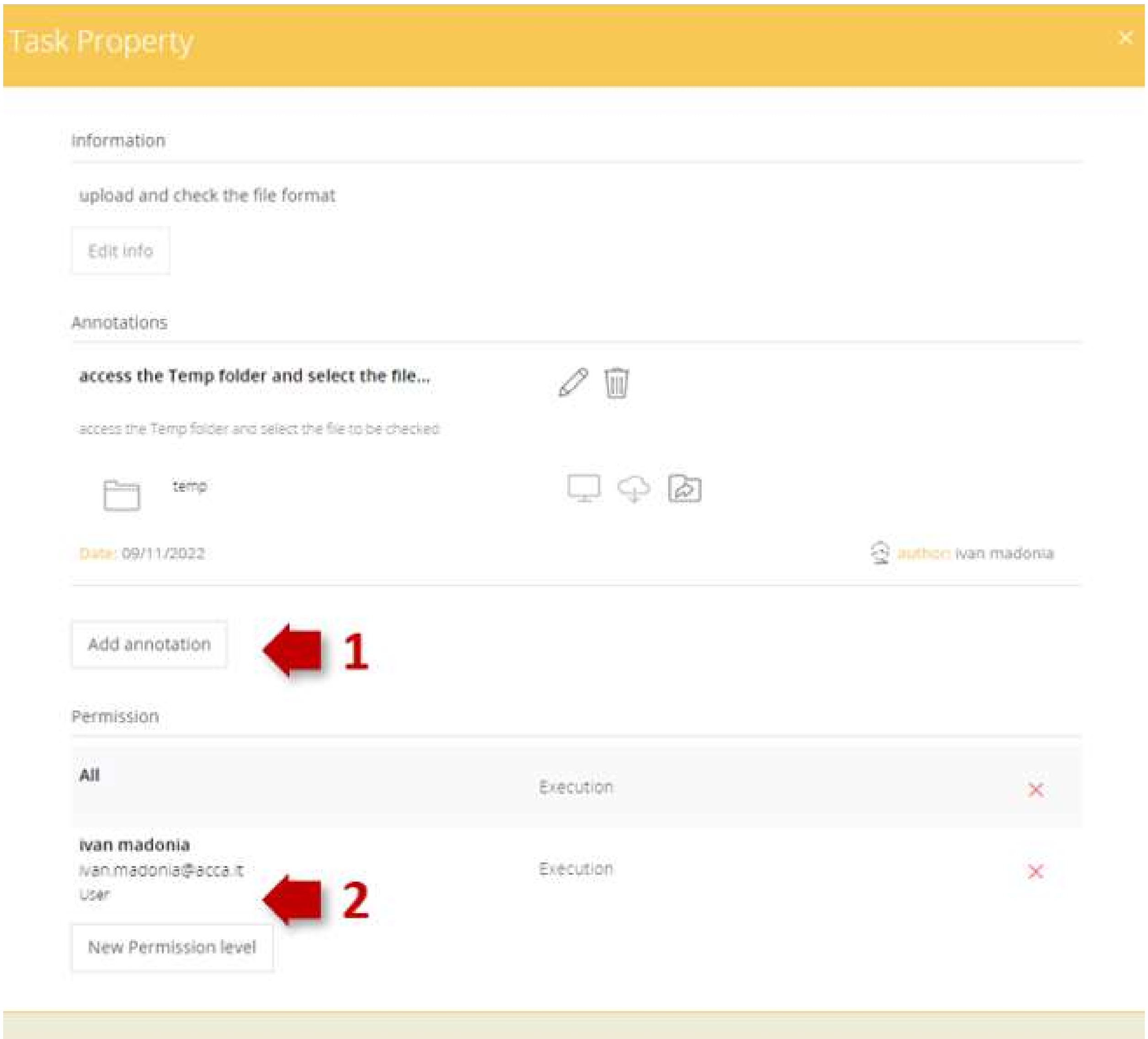

Figure *164. Task Property*

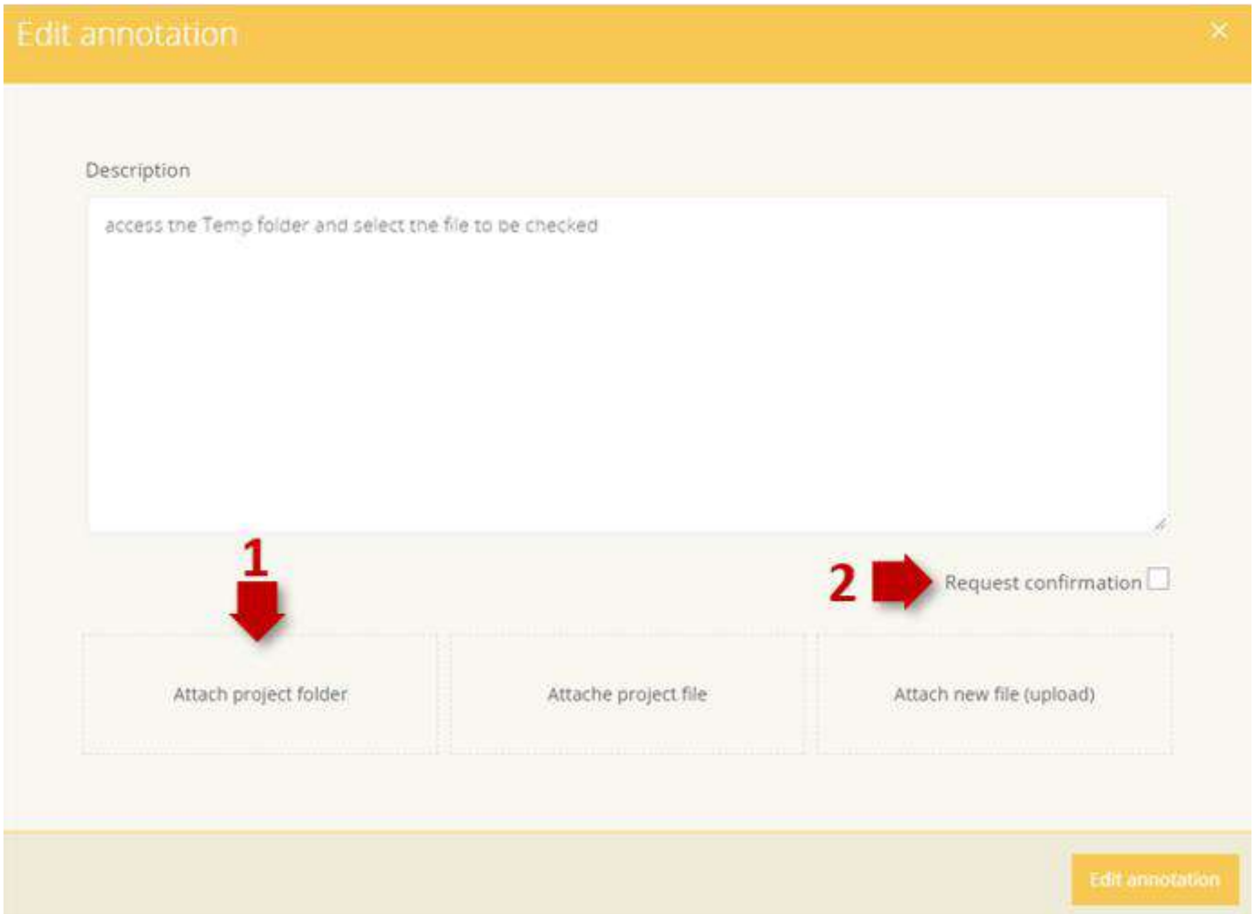

Figure *165. Add annotation*

In the "Task Properties" section, it is also necessary to assign the permissions related to the users involved in the individual task (arrow 2 Figure 164). A modal window will require the user name and the permission level Figure 166.

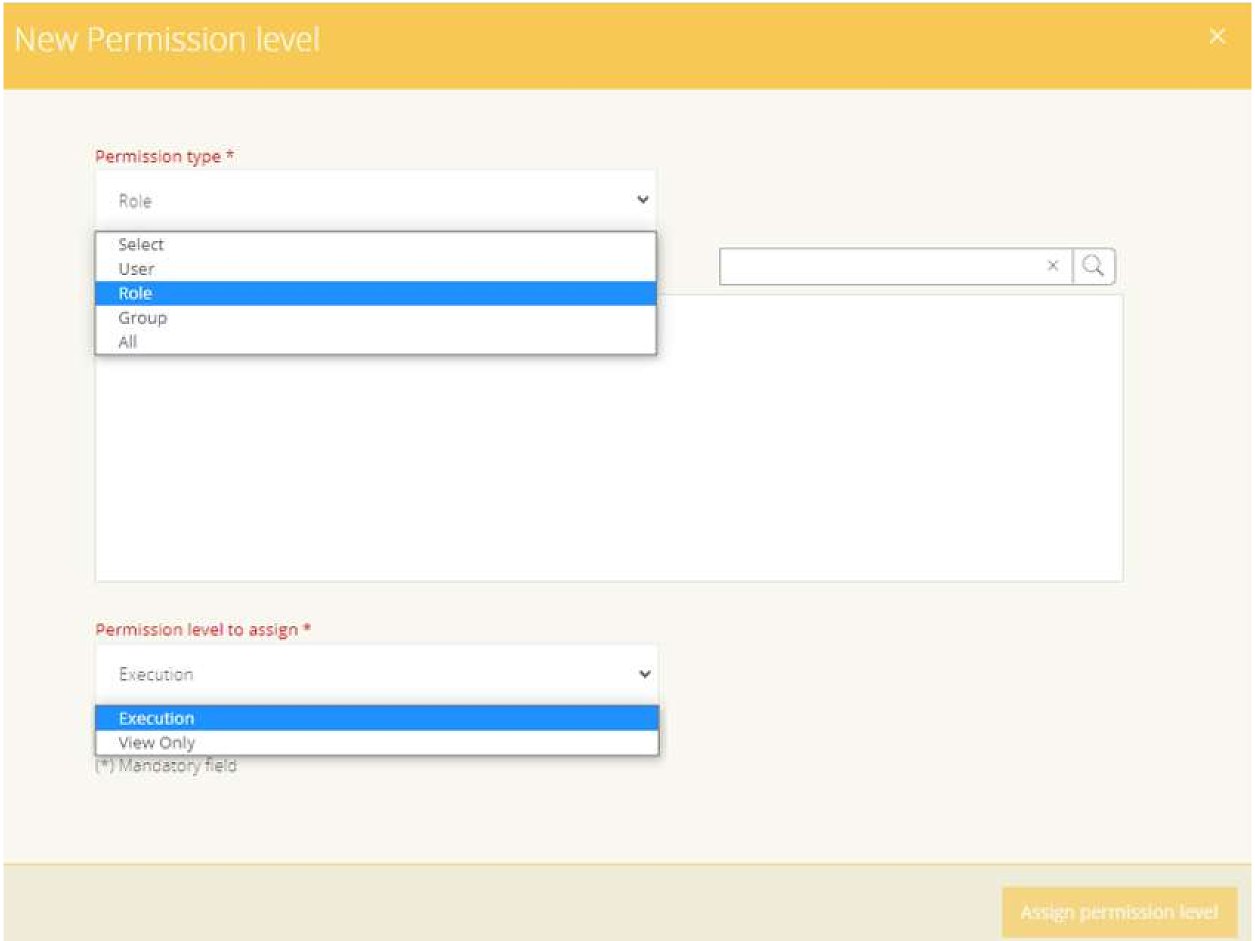

Figure *166. Allocation of permits*

6.4.3 New workflow using an existing workflow as a template

By clicking on the "Create a Workflow using an existing Workflow as a template" button (Figure 30), you can select a pre-existing workflow, either from a subscription or another project, and create a copy associated with the project you are working on.

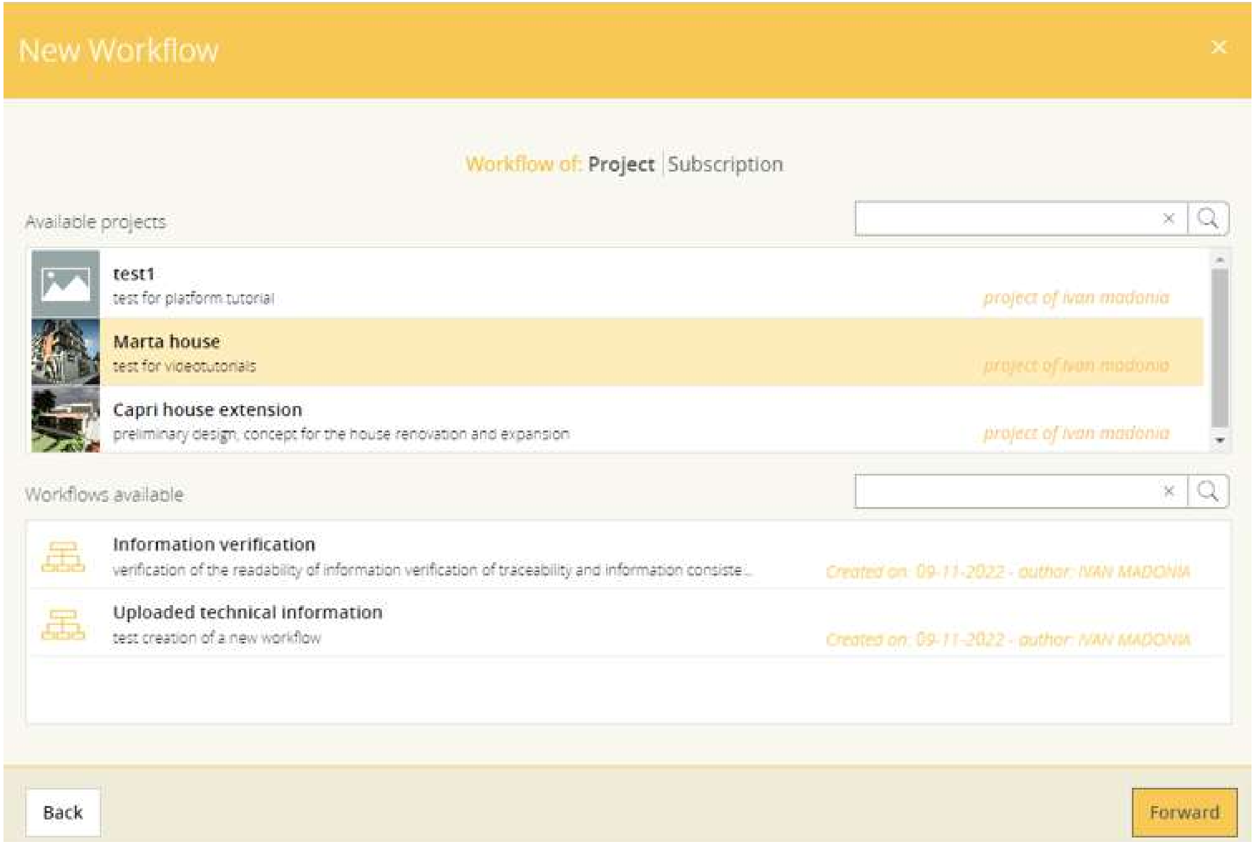

Figure *167. Modal window for selecting a workflow to use as a template*

As shown inFigure 167, you have the following two options from the drop-down menu:

- Subscription Workflow: in this case, you can access the list of recently created workflows at the subscription level;
- Project Workflow: these are the workflows used in other projects.

Once you have chosen the workflow, you can make the template effective by clicking on the "Next" button. A window opens up with the data entry form. Clicking on the "Create" button will open a screen like the one shown in Figure *32* allowing the building of the workflow, as shown in the paragraph 4.2.1.

At this point, the workflow copied to the project will appear in the "Project Workflow" section (Figure 168).

Figure *168. Copy the workflow to the available workflows section*

By selecting the workflow it will be possible to configure the process according to your needs (see par. 4.2.1.1 e6.4.2).

6.4.4 Obsolete Workflows

Obsolete workflows are processes that are archived because they are considered outdated and therefore no longer usable. Once a workflow is labeled as obsolete, it is no longer available for new use.

To make a workflow obsolete, in the "Project Workflow" section (see par. 6.4.1) you must first select it (arrow 1 Figure 169) and then click on the "WORKFLOW Properties" button (arrow 2 Figure 169)

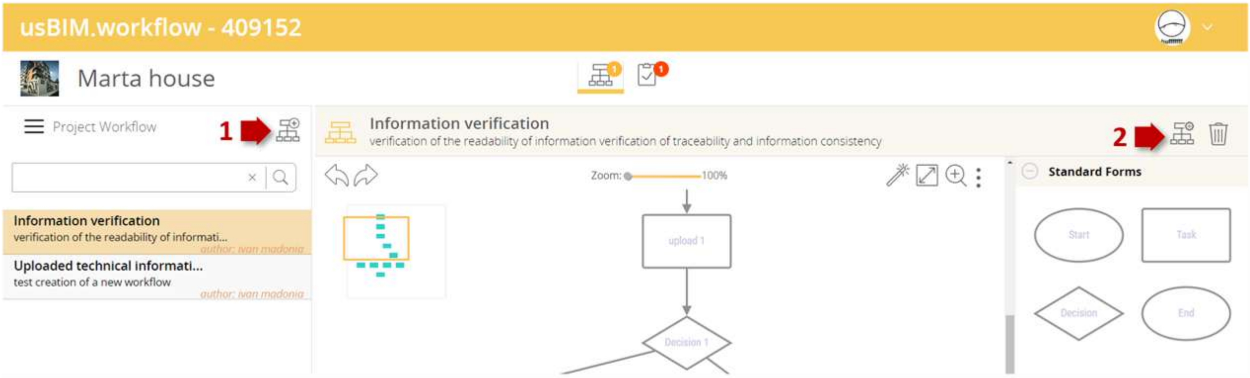

Figure *169. Making a project workflow obsolete (a)*

In the pop-up window that appears, click on the "Edit Information" button (Figure 170).

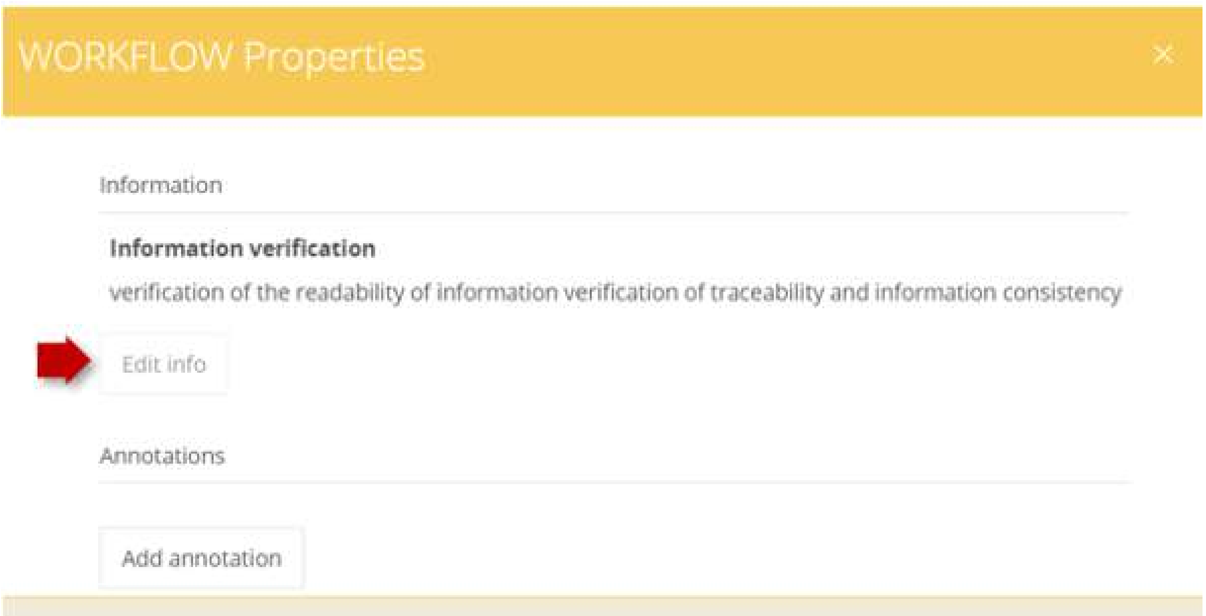

Figure *170. Making a project workflow obsolete (b)*

In the new pop-up window, simply tick the "Obsolete" option (Figure 171).

Figure *171. Making a project workflow obsolete (c)*

To view obsolete workflows, from the "Workflow" section, click on the context menu and select the "Project Workflow" option (Figure 172).

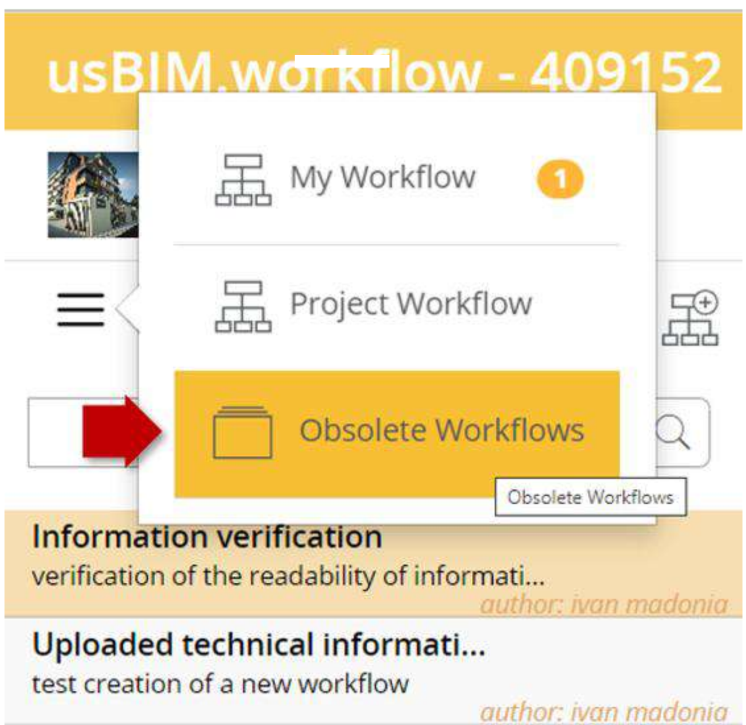

Figure *172. "Obsolete Workflows" section*

An obsolete workflow can be made available again in the "Project Workflow" section. With this objective in mind, once the workflow is selected from the "Obsolete Workflow" section, the abovementioned procedure is repeated but, in this case, the "Obsolete" option is unchecked from the "Edit information" panel of the "WORKFLOW Properties".

6.5 My Workflows

6.5.1 Starting a Project Workflow

Once you have finished structuring the workflow and assigned permissions on all tasks, it can be started. You will need to first open the "Project Workflow" section and then "My Workflows" section (Figure 173).

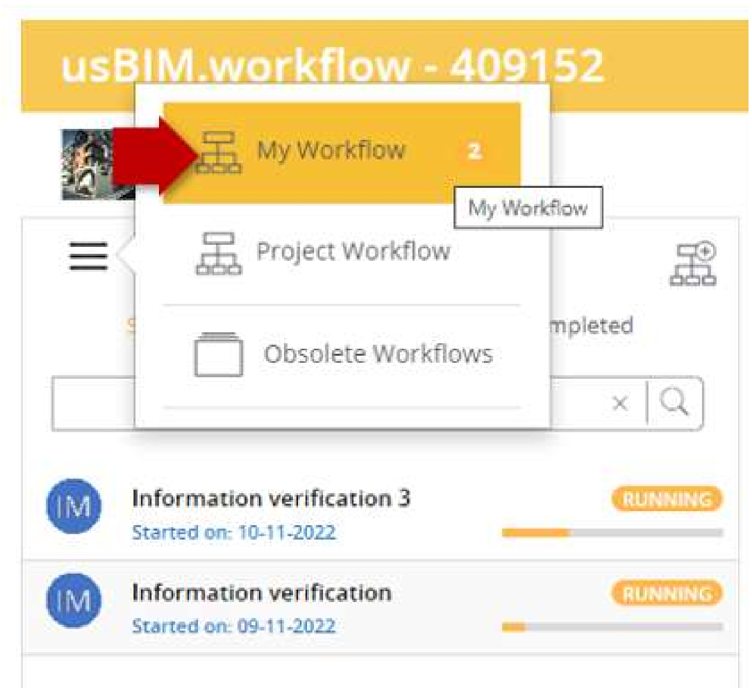

Figure *173. "My Workflows" section*

This operation, which precedes the starting phase of a workflow, allows you to see all the project workflows started (or in progress), to check their status (arrow 1Figure 174) and to create the starting instances.

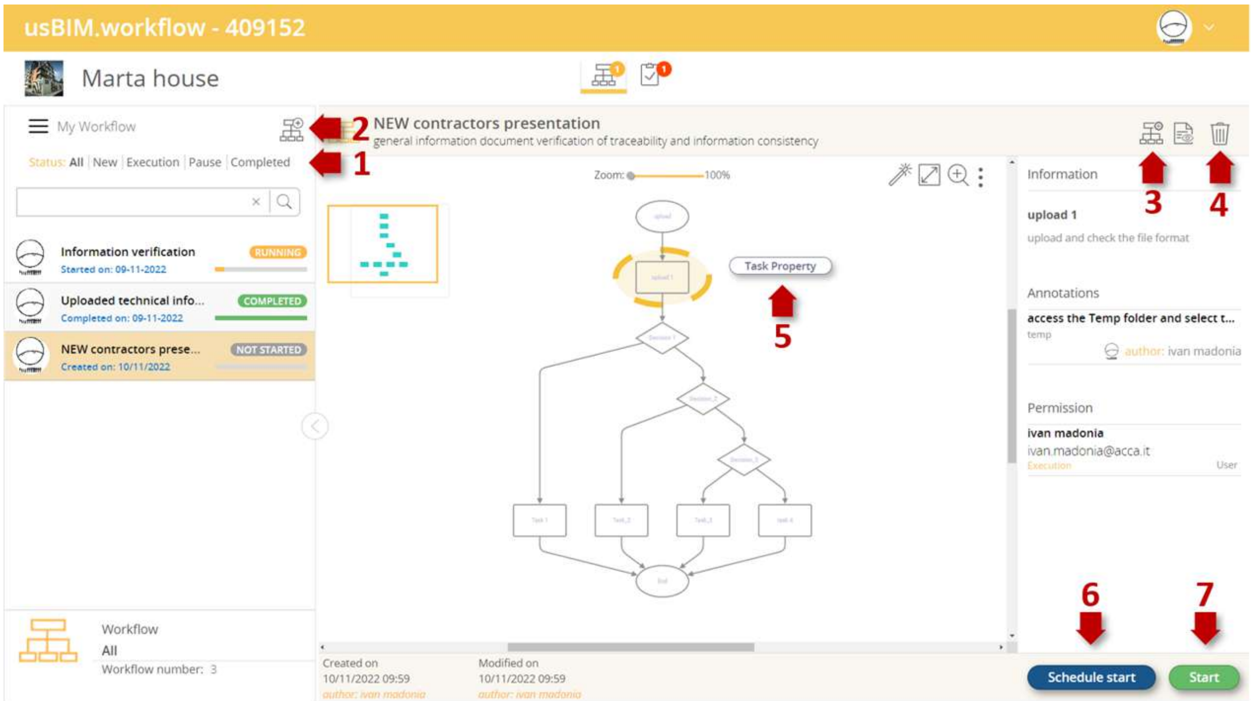

Figure *174. Section where to start or schedule the workflow*

The workflow can be started by all the members on the platform.

To start a new workflow, click on the "Add Workflow" button (arrow 2 Figure 174); in the "Add Workflow" pop-up window you can select the workflow to start by choosing from those of the project or only those that have already been executed (arrow 1 Figure 175). Once the workflow has been chosen, click on "Next" (arrow 2 Figure 175) to create the instance to be started.

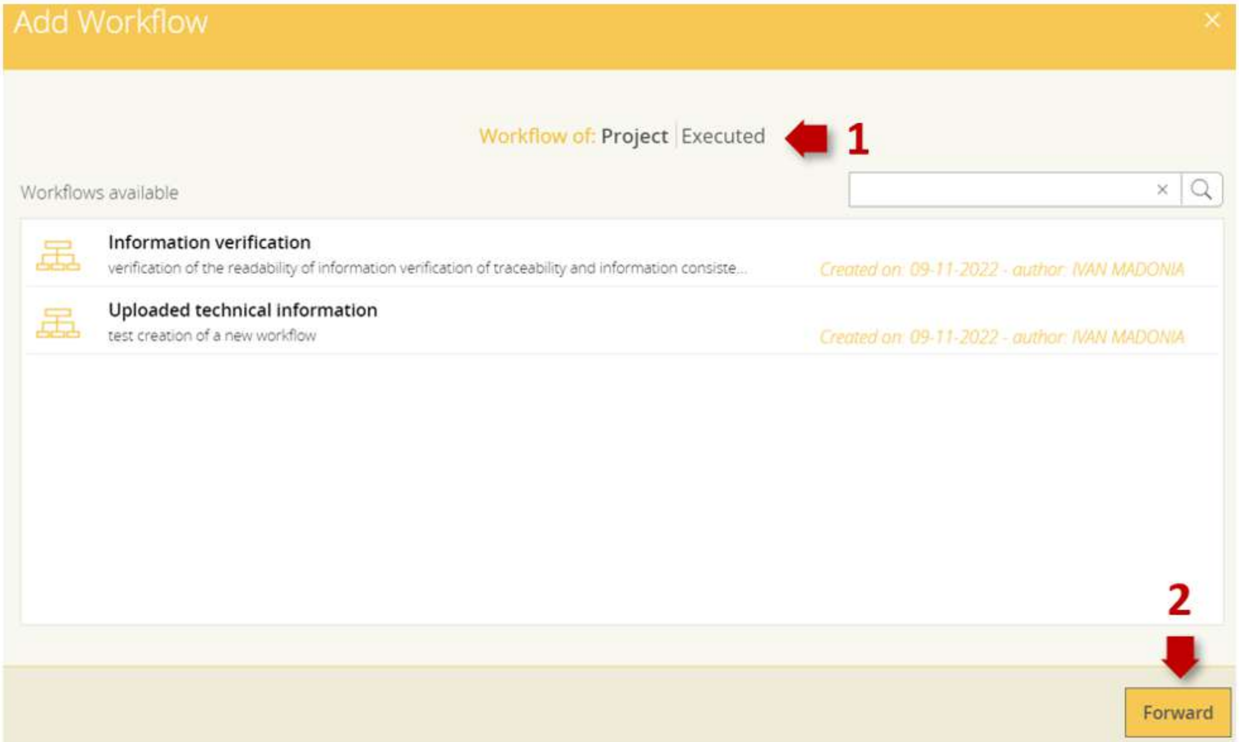

Figure *175.Starting a Project Workflow*

You can make changes to the properties of the workflow instance (arrow 3 Figure 174) or to the properties of tasks (arrow 5 Figure 174). If the status is still "Not started", you can delete the instance using the "Delete" option (arrow 4 Figure 174). To start the instance, click on "Start" (arrow 7 Figure 174). It is possible to "Schedule" the start of a Workflow by clicking on the "Schedule Start" button (arrow 6 Figure 174).

Remember that if you have not assigned permissions on all tasks, you cannot start the workflow (Figure 176).

Figure *176. Notice of missing execution permissions*

6.5.1.1 Workflow Scheduling

In the "My Workflows" section, you can "Schedule" the start of a Workflow by clicking the "Schedule Start" button (arrow 6 Figure *174*) (see par. 6.5.1). It is possible to schedule a workflow only if for each Task there is at least one "starting" permission. Alternatively, the platform will show users an information message that lists the Tasks on which there is no Execution permission (Figure 176, see par. 6.5.1).

To start the scheduling, a window will be open up to define (Figure 177):

- The Start date (including time) that is required and must be later than the current date.

You can define two scheduling frequencies:

- Once
- Daily

In the case of "Daily" planning, it is also possible to define the end date.

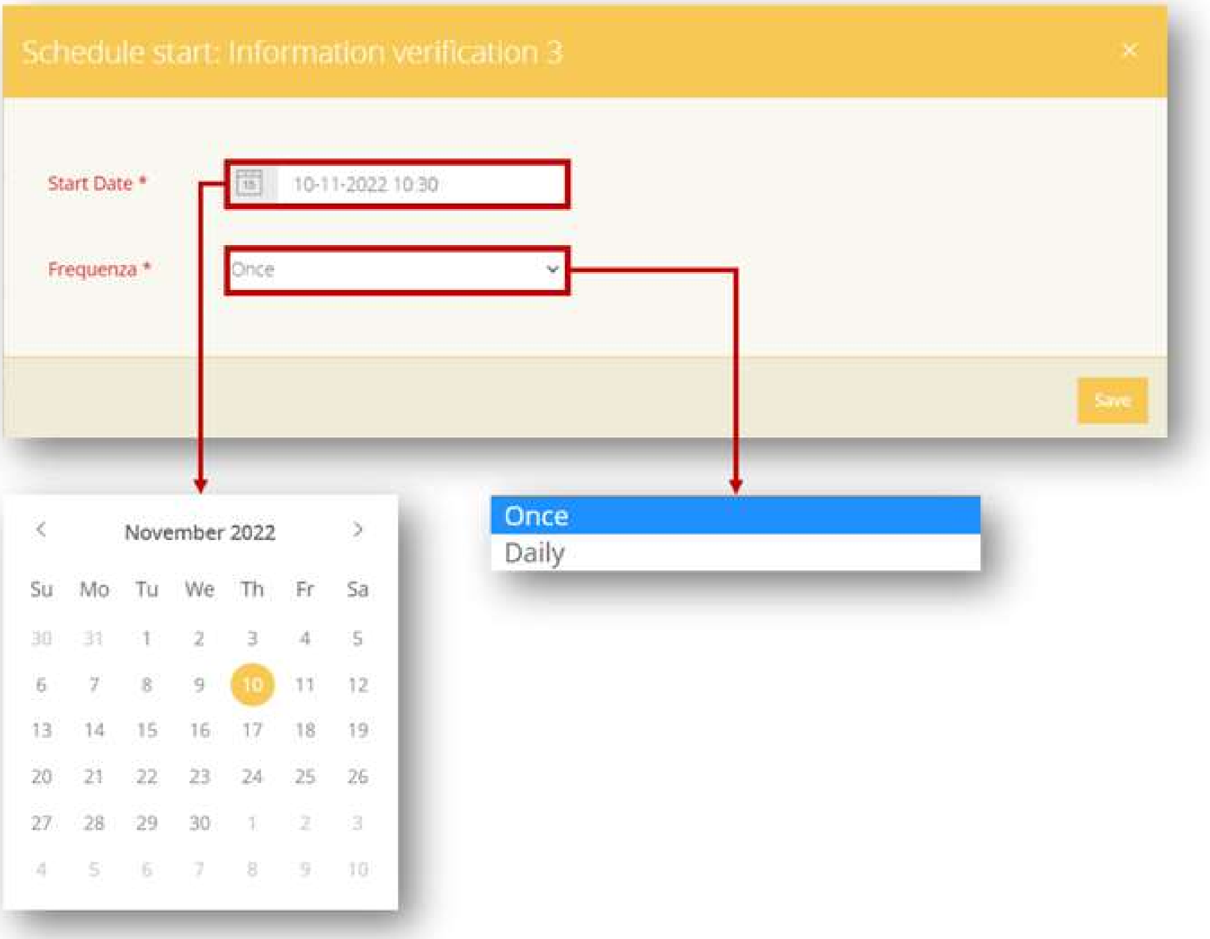

Figure *177. Workflow Schedule Window*

Once a schedule is set up, the Workflow will be marked with an icon representing the schedule (Arrow 1Figure 178).

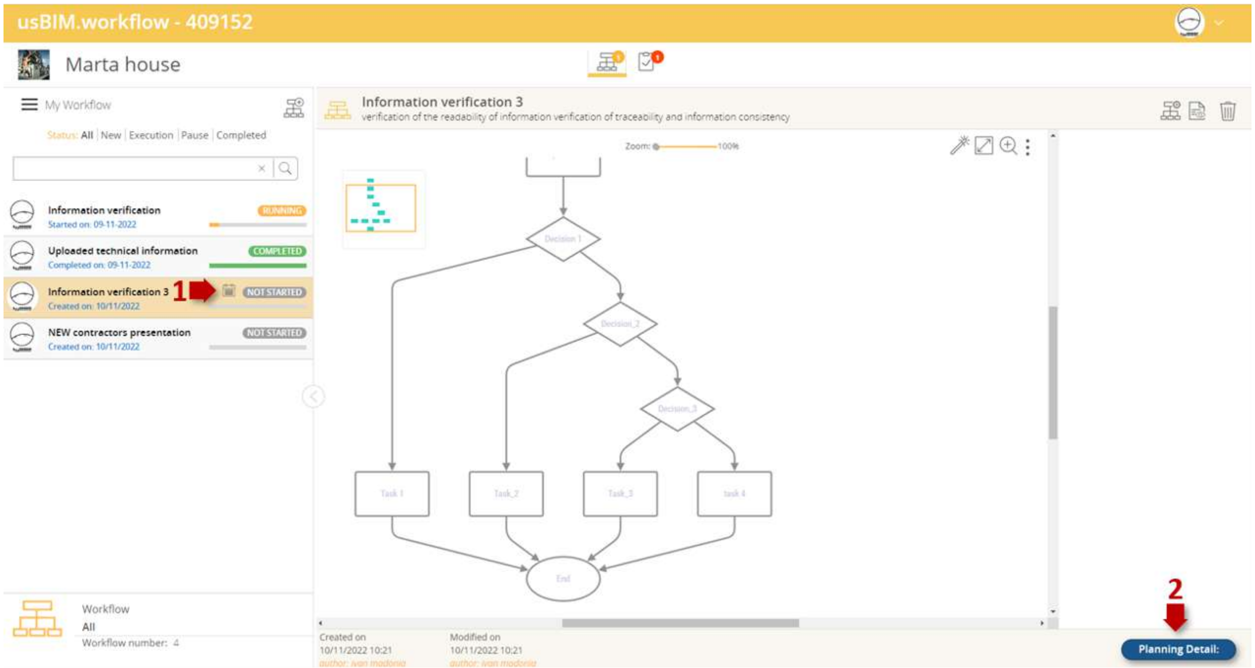

Figure *178. Schedule Detail*

To view or cancel the schedule, click the Schedule Detail button (Arrow 2 Figure 178) and a contextual window will be displayed in which (Figure 179):

- the schedule start date
- the scheduling frequency
- possible planning end date
- Using the "Stop Planning" button it is possible to delete the schedule.

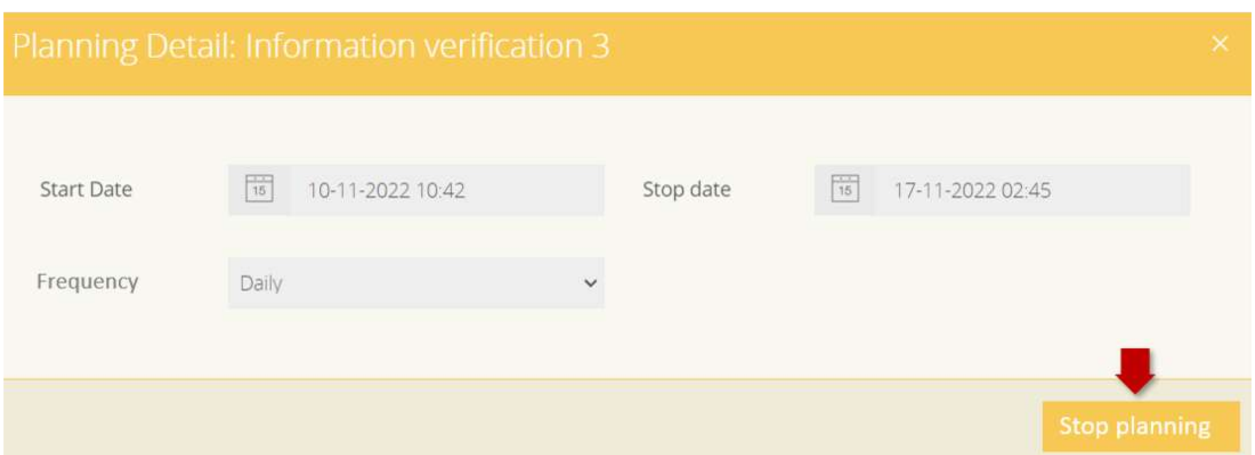

Figure *179. Deleting the Workflow Schedule*

6.5.2 Using a Project Workflow

Once the workflow has started, in the "My Workflows" section the task being executed is highlighted in yellow (arrow 1 Figure 180). The user who has been assigned an instruction on the task receives a double notification: one via email and one on the platform. The notification on the platform is, in turn, dual: a first green notification indicates that a new workflow is being run (arrow 2 Figure 180); a second red notification appears on the "Task" icon indicating that the user has been assigned an instruction on the task in progress (arrow 3 Figure 180).

The status is also indicated (arrow 4 Figure 180) next to the workflow name. There are four possible options:

- Not Started: the workflow instance was created but not started.
- Running: the workflow is active and running;
- Paused: the workflow is active but has been temporarily paused (arrow 5 Figure 180);
- Completed: the workflow is finished and no longer active.

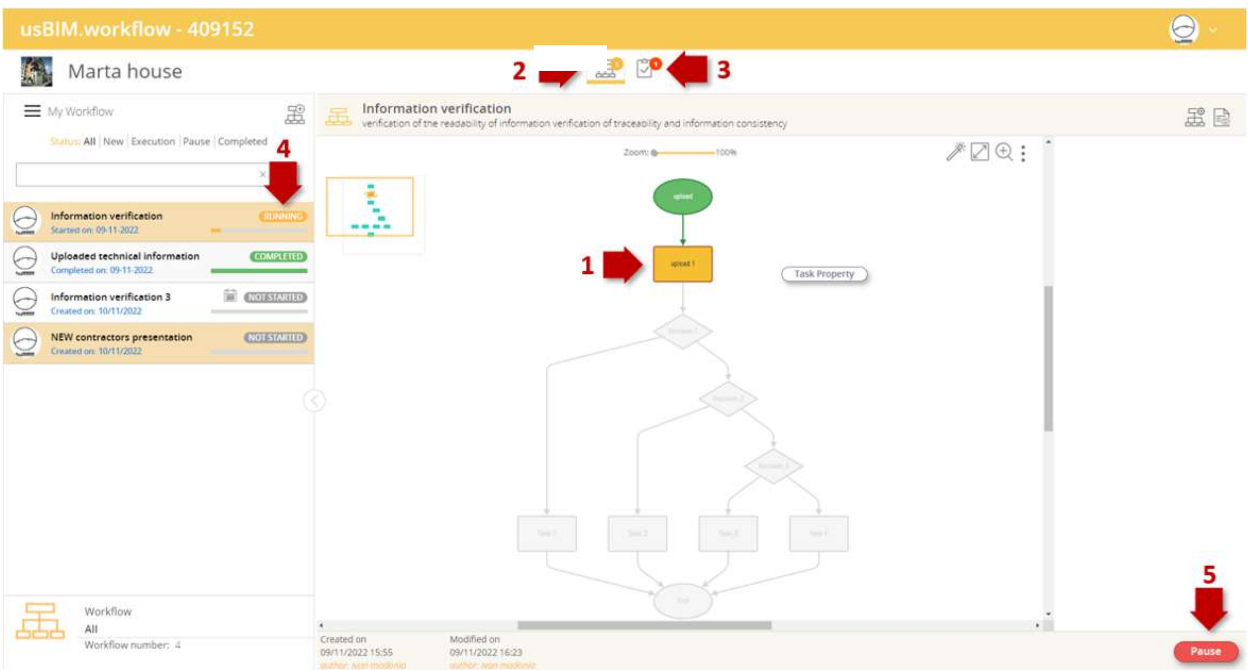

Figure *180. Running a new workflow*

By clicking on "Task Properties" (arrow 1 Figure 181), you can edit the information, add permissions on the task and add annotations. It should be pointed out that the changes made do not involve the project workflow task but the single instance task. In the right panel (arrow 2 Figure 181), when a task is selected, you can see a summary of its associated information, annotations, and permissions. If it is necessary to make changes to the information and/or add annotations, it is possible to do so through the "WORKFLOW Properties" button (arrow 3 Figure 181).

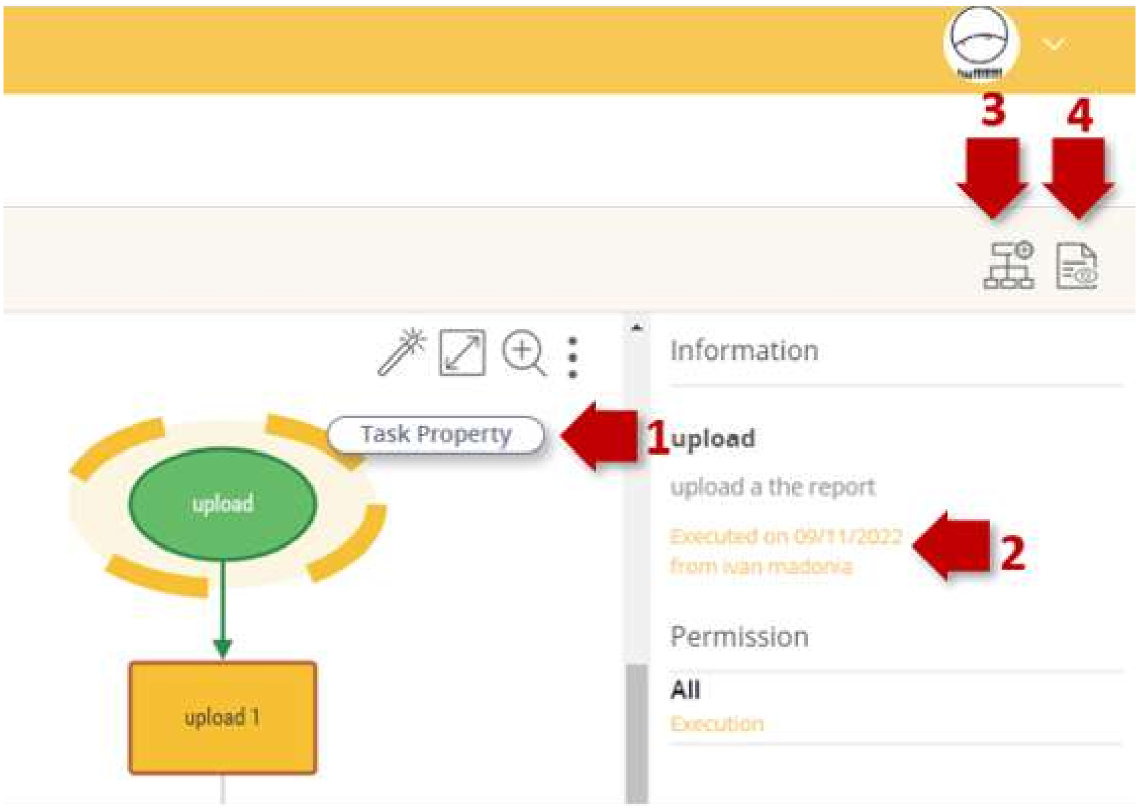

Figure *181. Editing the workflow instance*

Use the "Audit" button to access the part dedicated to workflow events (arrow 4 Figure 181). From this section, you can export the logs related to the workflow by clicking on the appropriate "Export to CSV format" button (Figure 182).

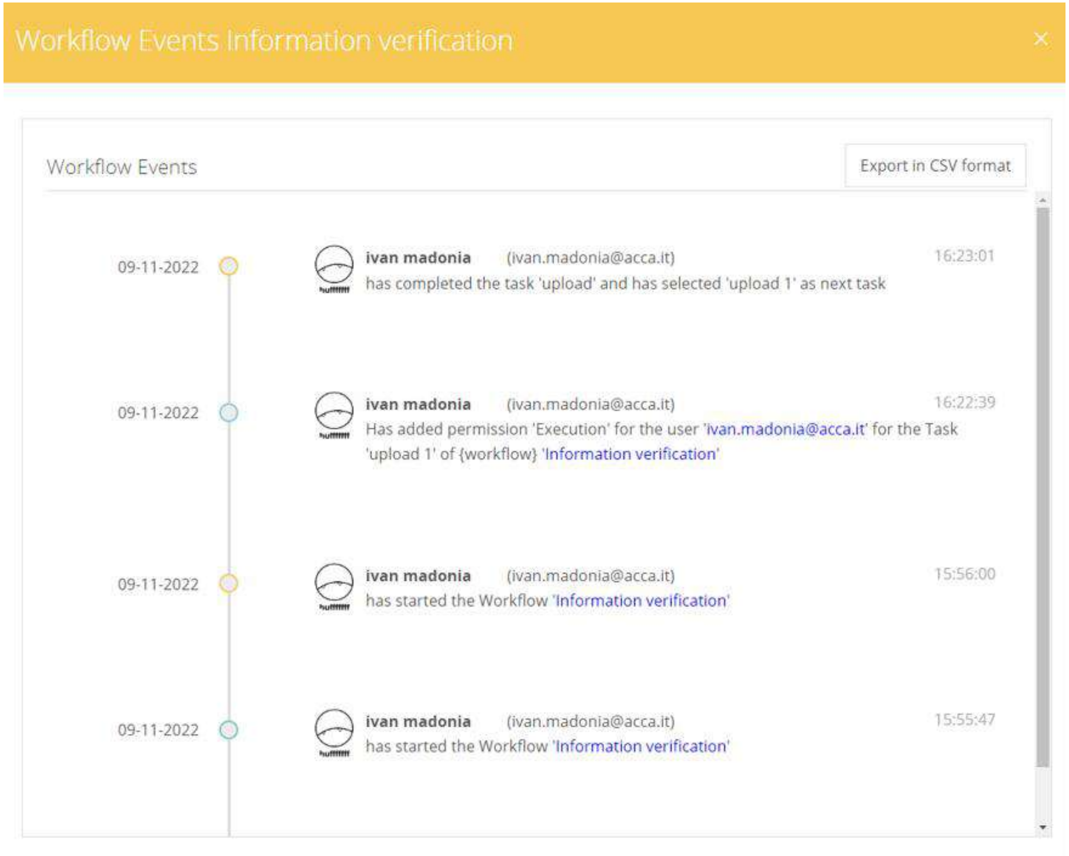

Figure *182. Workflow Audit*

6.5.3 Task

By clicking on the "Task" button (arrow 1 Figure 183), you can view and select the tasks for which the user has an assigned instruction. The left panel "My Tasks" also shows the status of the individual tasks, which can be "To be performed" or "Done" (arrow 2 Figure 183). A filter on the status of the tasks can be carried out through the options shown in the "Status" section (arrow 3 Figure 183).

Once a task is selected, the name of the workflow to which it belongs is highlighted at the top of the right panel, as well as the information defined for the specific instance (arrow 4 Figure 183). Using the "WORKFLOW Properties" button, you can edit the information and add new annotations to the specific workflow instance (arrow 5 Figure 183).

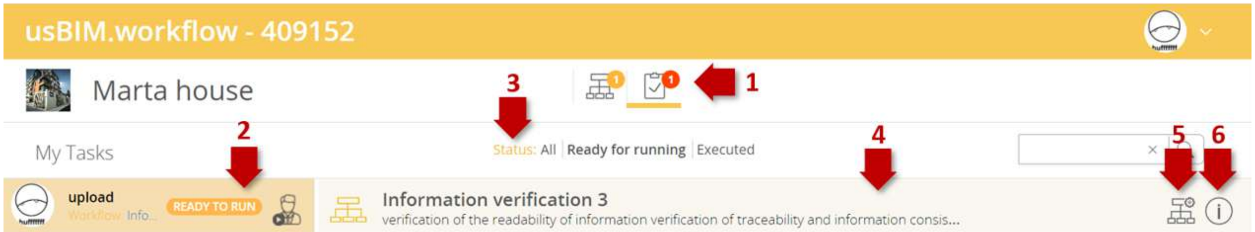

Figure *183. "Task" view*

By clicking on the "Information" button, the user can see where the selected task is located in the workflow (arrow 6 Figure 183) ; in the pop-up that opens, there is also the possibility to download the image shown in the video (Figure 184).

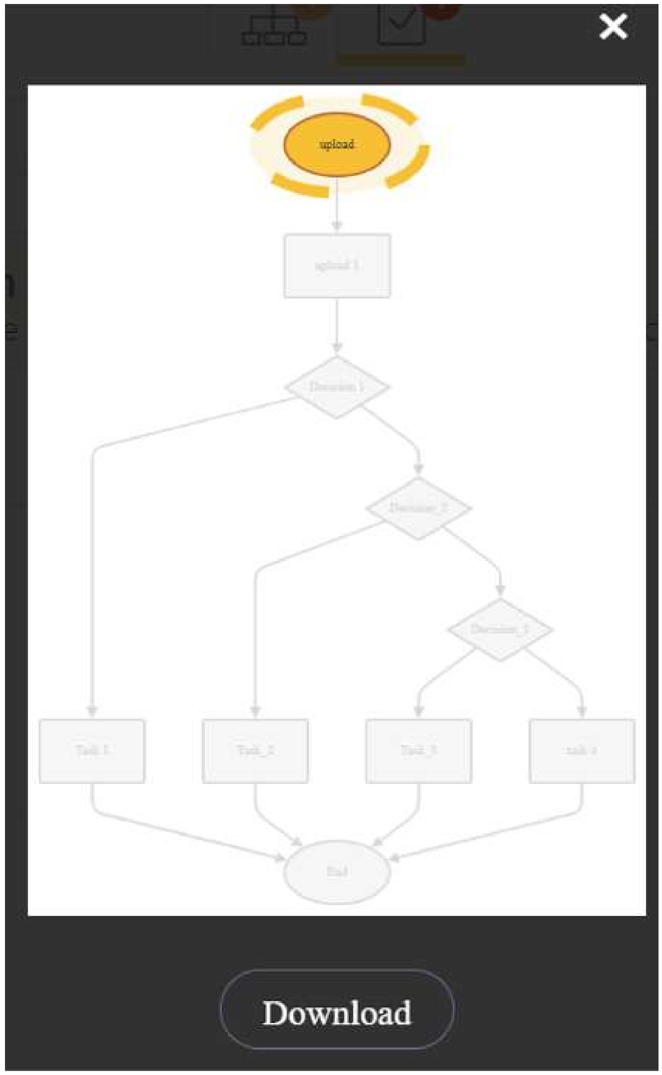

Figure *184.Task "Info" view*

6.5.3.1 "Execution" Permission

The right panel is now analyzed when, on the task in execution, the user has been assigned the "Execution" permission.

The "Information" section shows the title of the task and any general description (arrow 1 Figure 185); the "Annotations" section shows all the annotations provided in the task (arrow 2 Figure 185). If users need to add further annotations, they can use the appropriate "Add annotation" button (arrow 3 Figure 185) while if they complete what is expected, they can close the task using the "Complete Task" button (arrow 4 Figure 185).

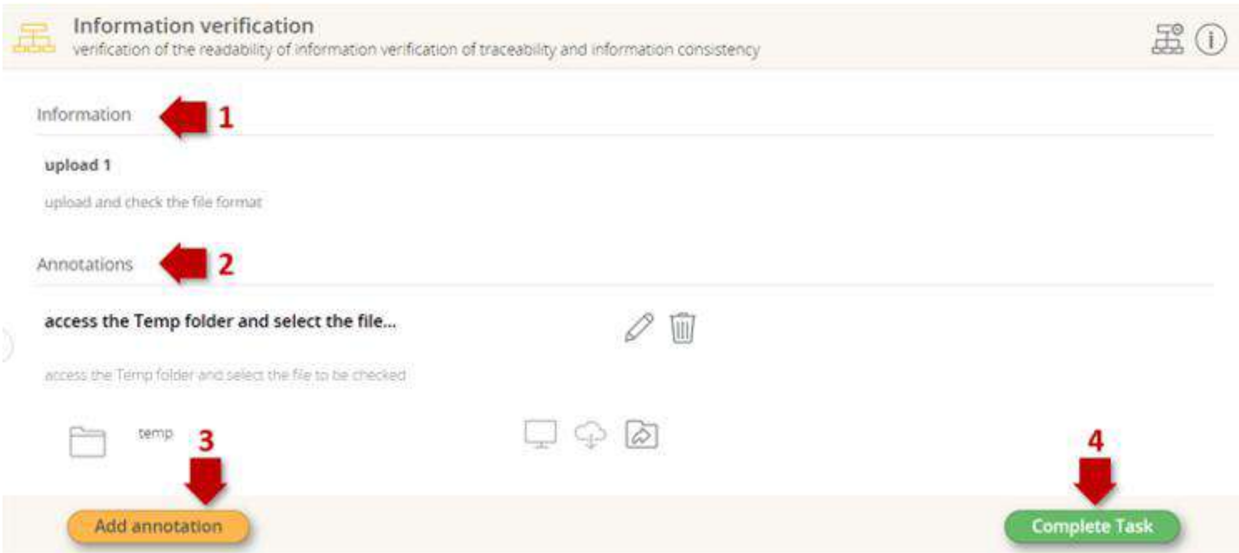

Figure *185. Description of the task panel with "Execution" permission*

By going to the "Annotations" section (Figure 185) you can view any annotations/ documents (files, project folders, project files) of the task. In the left part the annotation description is shown (arrow 1 Figure 186) whereas in the central part there is the possibility to modify the annotation through the "Edit annotation" (arrow 2 Figure 186) button or to delete it with the "Delete" button (arrow 3 Figure 186); in the right part, if confirmation of the execution has been requested, it is possible to check the confirmation (arrow 4 Figure 186).

Note: if the annotations of a task require confirmation of the execution, the "Done" flag must necessarily be checked to complete the operation and close the task; this operation is irreversible.

usBIM.platform allows you to attach documents and/or folders for each annotation. If documents supported by the usBIM.browser service are attached, it is possible to view them directly online via (arrow 5 Figure 186); if the document format is not supported then it is possible to download it on your local machine (arrow 6 Figure 186). Finally, the GoTo functionality allows the user to get directly to the source folder of the attached project document (arrow 7 Figure 186).

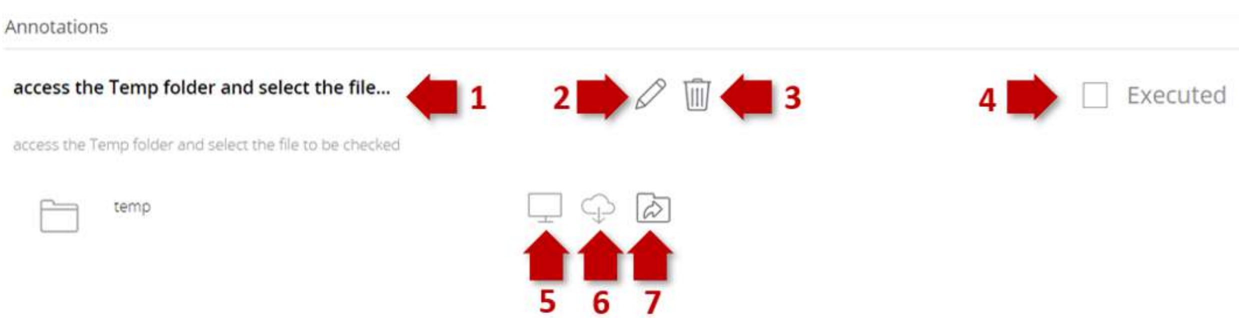

Figure *186. Functionality of the "Annotations" section*

Once the execution is confirmed, the task can be completed: a pop-up asks the user to confirm that they want to proceed with this operation, also informing them of the non reversibility of this choice (Figure 187).

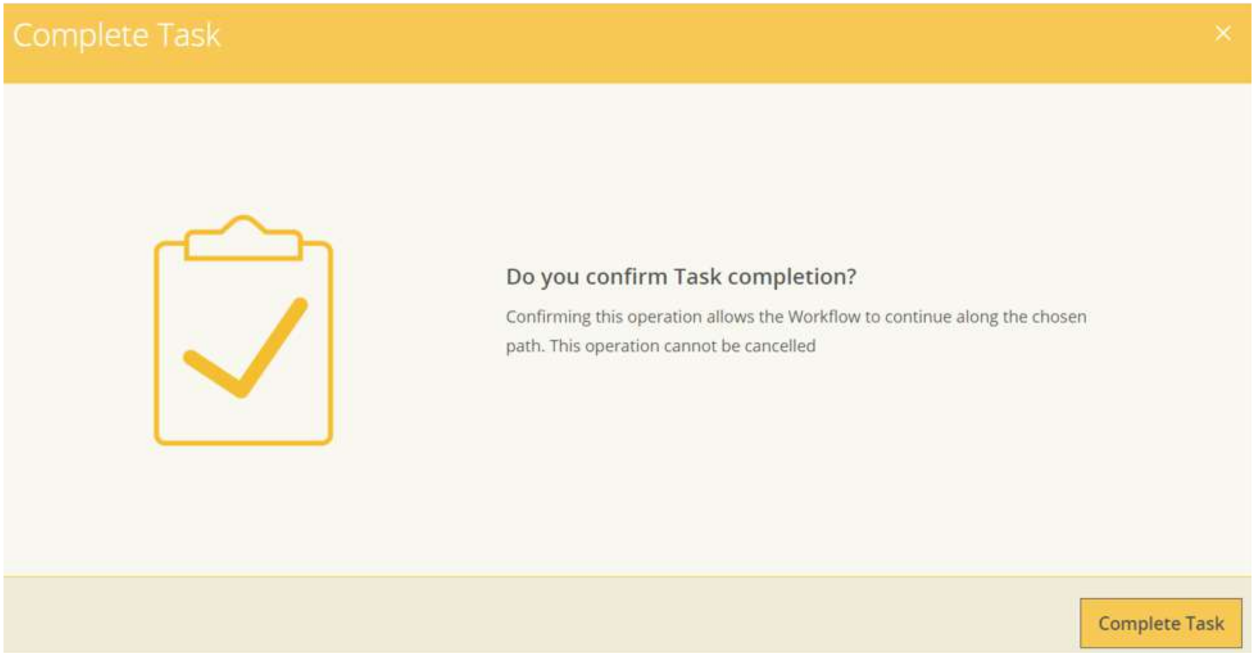

Figure *187. Confirmation that the task is complete*

Clicking on "Complete Task" proceeds to the workflow with the activation of the next task (Figure 188).

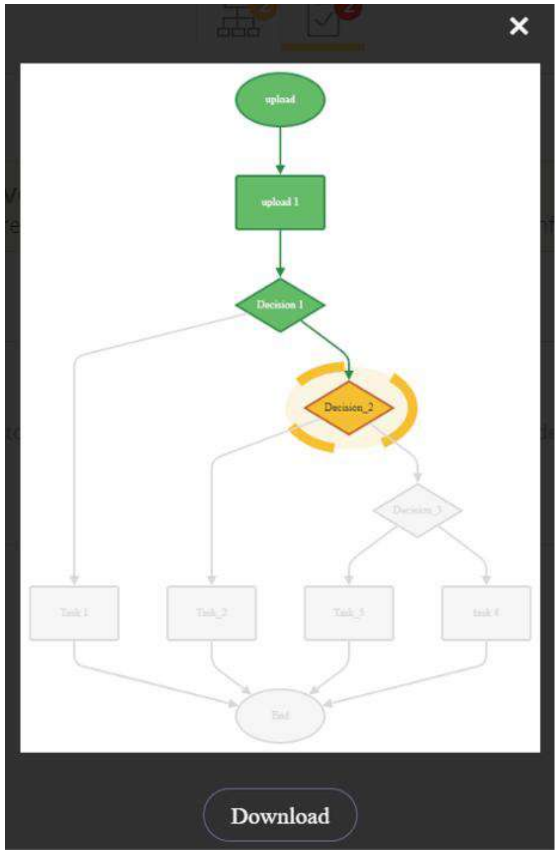

Figure *188. Activating the next task*

6.5.3.2 "View Only" permission

The panel of the running task is analyzed when the user has been assigned the "View Only" permission.

As for the user who has allowed "Execution", the "Information" section shows the title of the task and any general description (arrow 1 Figure 189) while in the "Annotations" section there are all the annotations provided in the task (arrow 2 Figure 189). Alternatively, the user with "View only" does not have the possibility to add additional annotations using the "Add annotation" button nor can he close the task with "Complete Task".

As far as the "Annotations" section is concerned, it is not possible to modify an annotation or delete it, nor is it possible to flag the confirmation of the execution in the right area (arrow 6 Figure 189). If documents supported by the usBIM.browser service are attached, it is possible to view them directly online via (Arrow 3 Figure 189). If the document format is not supported then it is possible to download locally (Arrow 4 Figure 189). Finally, the GoTo functionality allows the user to get directly to the source folder of the attached document (arrow 5 Figure 189).

Figure *189. Description of the task panel with "View Only" permission*

6.6 Project Events

In the "Manage Workspace" menu there is a special tab dedicated to the events of the project itself, as indicated by the arrow in Figure *190*.

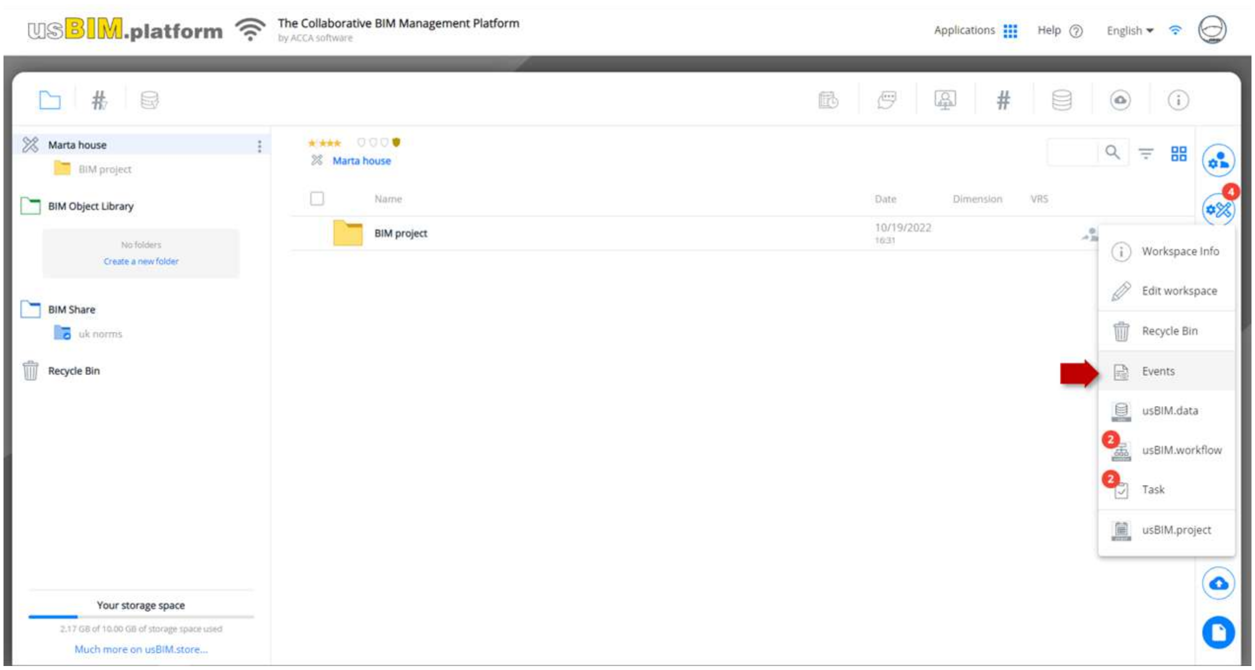

Figure *190. Accessing the Project Events Tab*

The events scheduled within a project appear as shown in Figure *191*.

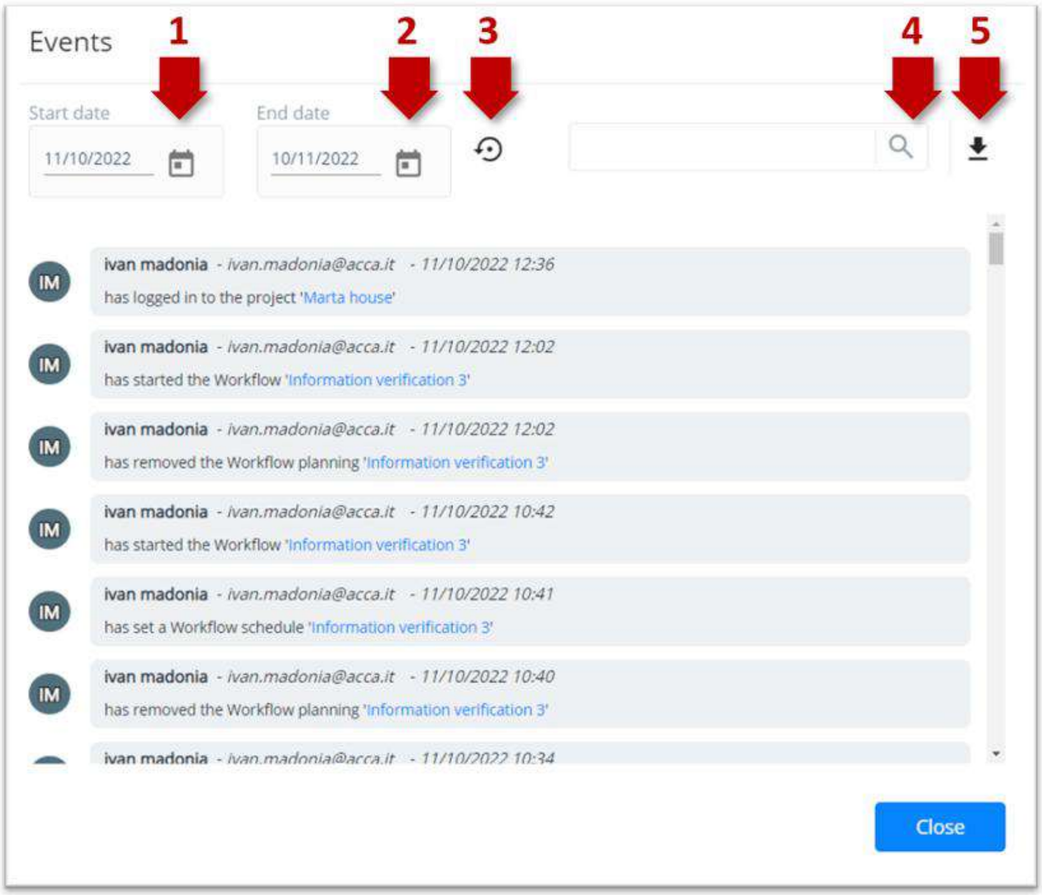

Figure *191. Project Events*

The following features are available in the events tab:

- setting a start date for defining a specific timeline (arrow 2 Figure *191*)
- setting an end date for defining a specific timeline (arrow 2 Figure *191*)
- Restore the 30 days time span (arrow 3 Figure *191*);
- text search (arrow 4 Figure *191*).
- exporting event list to CSV format (arrow 1 Figure *191*);

7 Viewing Services

7.1 usBIM.browser

usBIM.browser is ACCA's online service for viewing, browsing and managing documents shared in usBIM.

Figure *192. The usBIM.browser service*

In particular, the service allows you to:

- view and manage all data, documents and models stored in the CDE directly online, without any need to install any software;
- collaborate with users connected to the project in real time even more, thanks to an instant messaging service;
- manage critical issues to collaboratively solve potential problems encountered in the model;
- add appropriate text-based comments to resolve a problem with the IFC File directly on the model;
- browse the 3D model online with any device with a basic Internet connection;
- connect construction drawings, descriptions, technical specifications and other documentation all together;
- localize all the IFC model objects information using link associations or attribute additional information by inserting #TagBIM keywords;

- view multiple IFC models in a single view;
- select more objects both from the tree node structure and directly on the model.

When you open the model in the openBIM format, both documents stored on the platform and external links can be linked to the model objects by creating links. More precisely, all this information can be

associated with the objects contained in the model, so that these become georeferenced with all information present within the platform.

#TagBIM metatags can also be added to the various objects of the model. This means, for example, characteristics, attributes and values: therefore, the information becomes a search keyword but also works as graphical filter on the model (for example, all objects that have a certain characteristic).

Supported Formats

The platform can manage proprietary and open file formats using usBIM.browser and is fully certified by buildingSMART International for import of the IFC format, standard for the exchange of information in building processes.

usBIM.browser supports the following digital formats (shown in **Appendix A: Supported formats**) that are uploaded into the CDE: IFC, EDF, RVT, RFA, OBJ, OBJZIP, AED, 3DS, DXF, DWG, SKP, SVG. All other content formats (i.e. jpeg, Micosoft Office formats, TXT, etc.), if supported, can be viewed in standard mode through the web browser, otherwise they can be downloaded and opened with the appropriate software.

7.1.1 Activate federation

Once a model has been opened in usBIM.browser, it is possible to trace it back to a possible federation in which it is contained. To do this, click on the "Federation" buttons (Arrow 1 Figure 193) and then on "Activate federation" (Arrow 2 Figure 193) where we find the name of the federation (or federations) that contains the model.

Figure *193. Activate federation*

Clicking on the button (Arrow 1 Figure 194) "Active" will then propose the federation as a whole where it will be possible to color (Arrow 1 Figure 195) or make the models in it transparent, to differentiate them from the starting model (Arrow 2 Figure 195). With the "restore original" button, instead, you can reset the changes made (arrow 3 Figure 195).

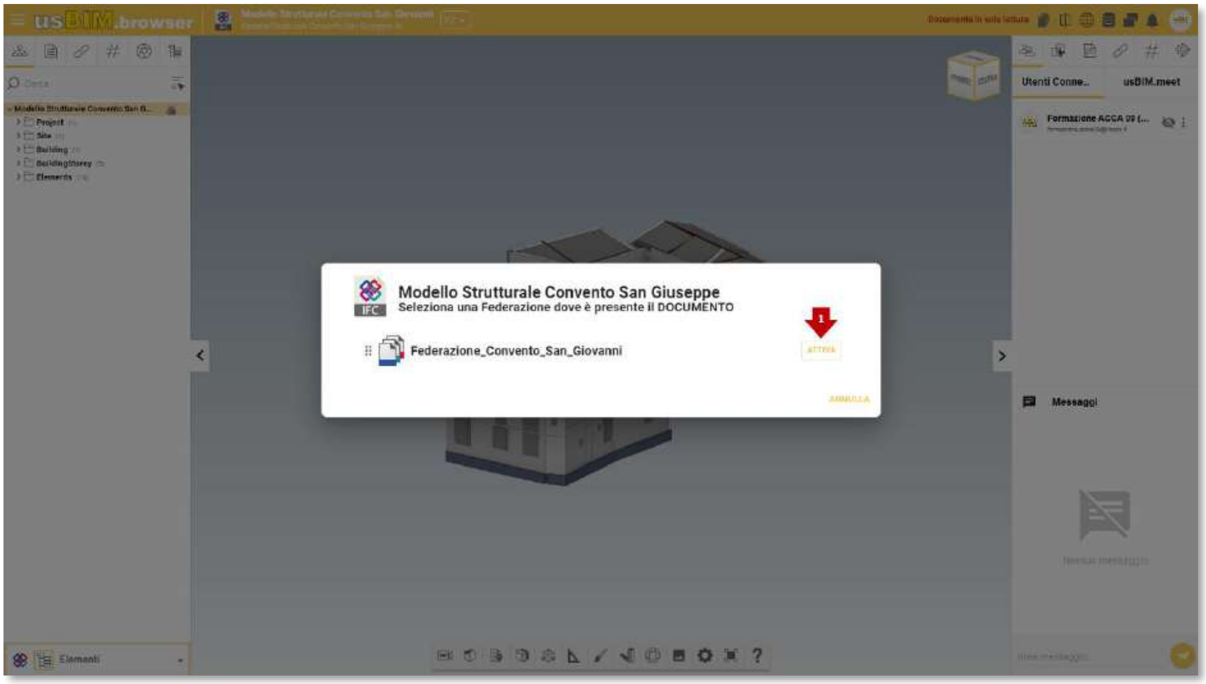

Figure *194. Federation*

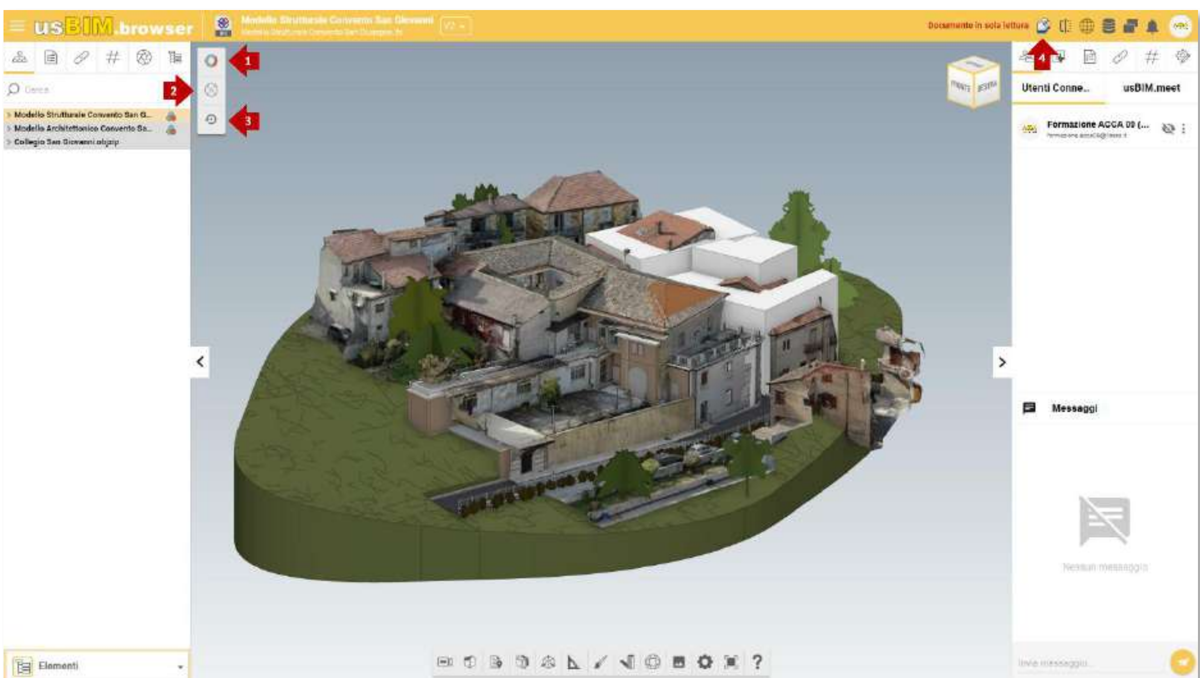

Figure *195. Display Options*

If you need to return to the single model, just click on the "Deactivate federation" button (arrow 4 Figure 195).

7.1.2 Compare Document

By opening a template in usBIM.browser you have the possibility to compare it with other files to get a response. This feature can be accessed from the toolbar (arrow 1 Figure 196) at the top right.

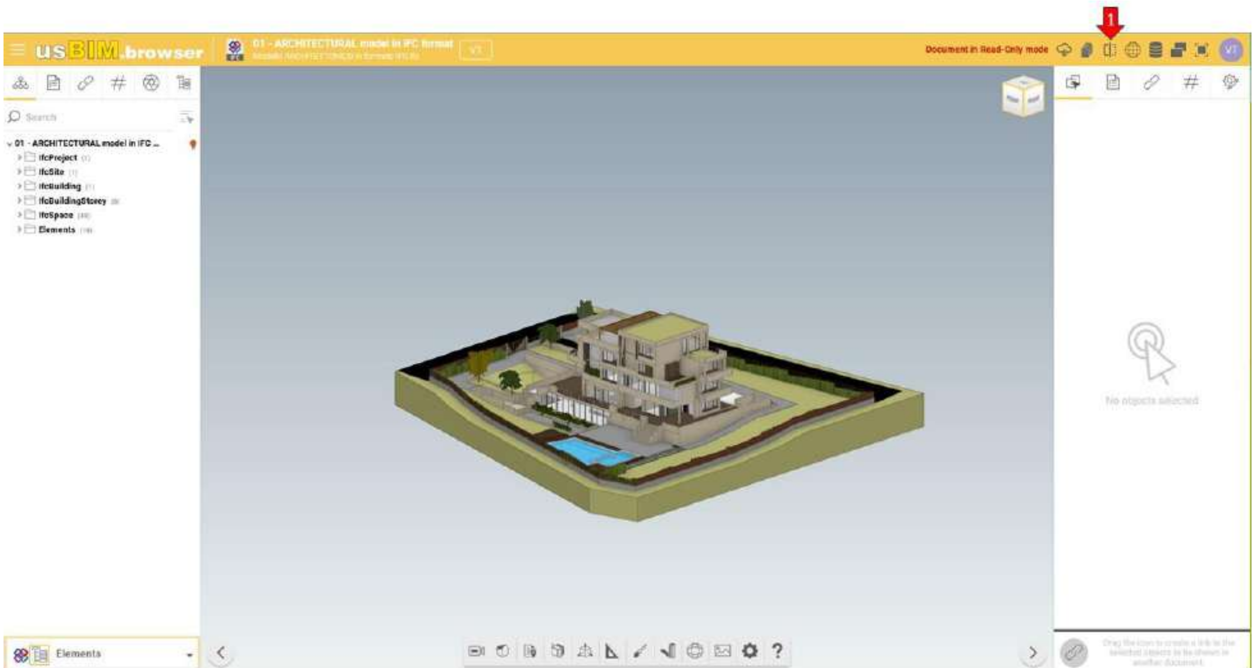

Figure *196. Compare Document*

Clicking on the "Compare Document" button will open a window where you can import a document for comparison, or choose whether to upload a previous version of the file in question (Figure 197).

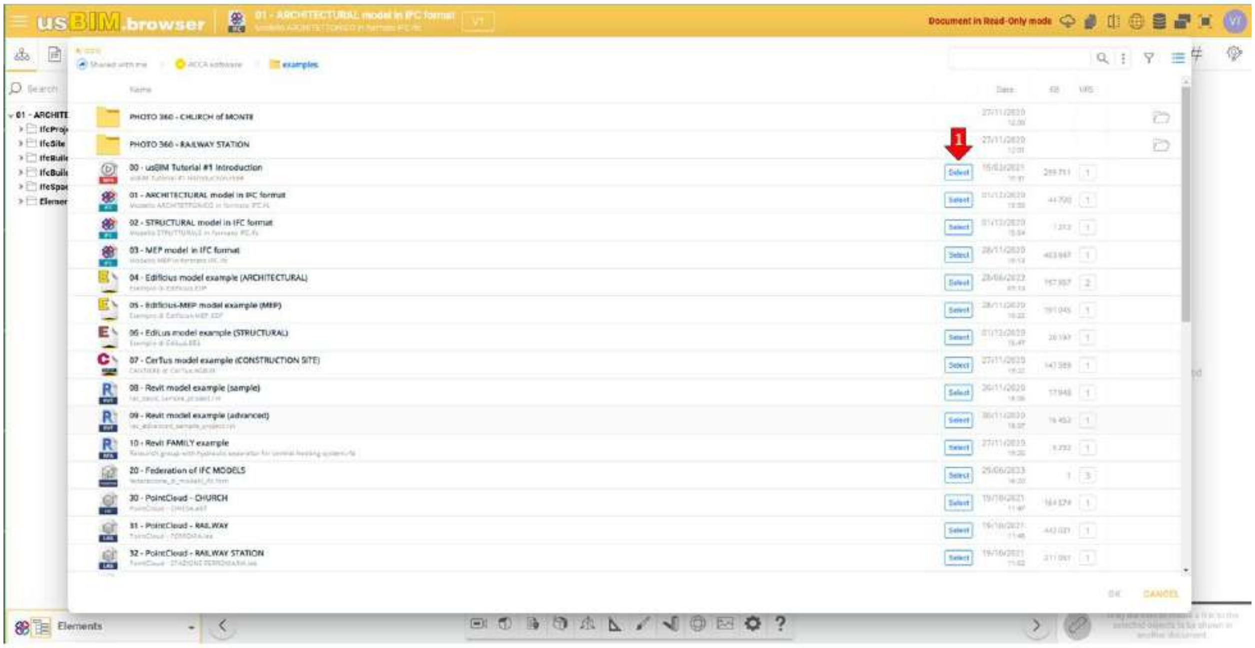

Figure *197. Selection of design*

By clicking on the "Comparison mode" button (arrow 1 Figure 198) we find two types of view:

- "Overlay" view with overlapping models (arrow 2 Figure 198)
- "Side by Side" view with models side by side (arrow 3 Figure 198)

Figure *198. Comparison mode*

The "Compare Document" feature has other options such as unlocking the view of the models to make them independent of each other (arrow 1 Figure 199), or changing the field of view (FOV) (arrow 2 Figure 199) and finally applying transparency to the compared model (arrow 3 Figure 199).

Figure *199. Customize the view*

If the models are not aligned, with the "Copy Camera" button (arrow 1 Figure 200) you have the possibility to get a uniform view, choosing whether to copy the view of the right side (arrow 2 Figure 200) or left side of the screen (arrow 3 Figure 200)

Figure *200. Copy camera*

7.1.3 Georeferencing

When it comes to georeferencing a BIM model, one of the fundamental aspects to take into account is the coordinates defined by a reference system.

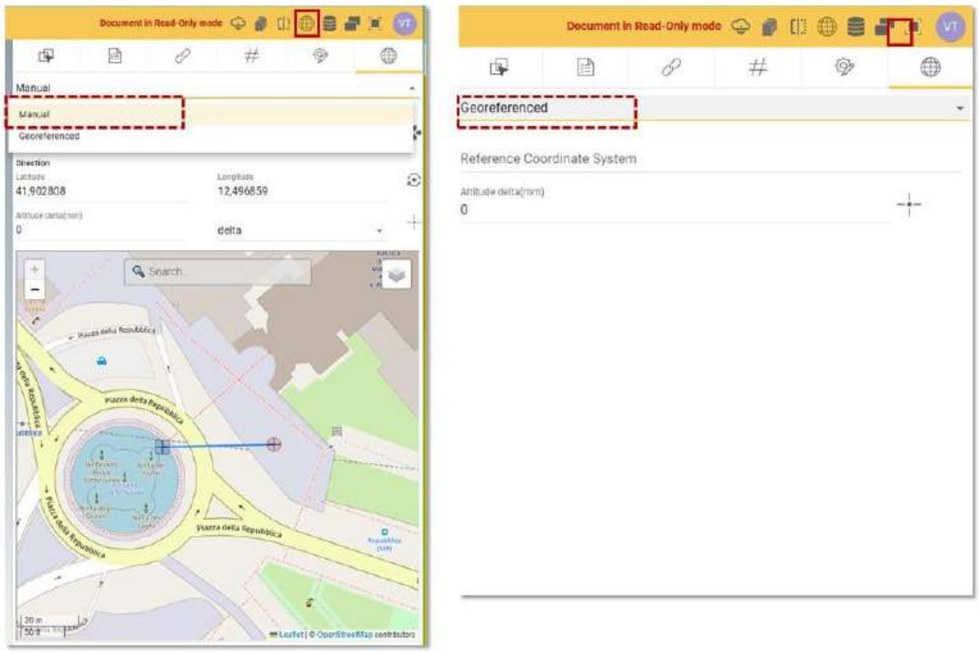

Figure *201. Georeferencing Mode*

The position of a model within a territorial system can be defined in different ways. This requires that a spatial reference system is chosen and that there is a relationship between the chosen system and that of the map. The choice of the reference system is linked to the application needs and is calibrated on the types of users who use it (cartographers, real estate managers, designers, etc.), on the detail of the information required and in compliance with the provisions of national indications or regulations.

Among the tools made available to the platform we have the possibility to correctly position, according to a reference system, our project. In the following paragraphs we will see how, to correctly insert the model in the territorial context, two different procedures can be used: *georeferenced* or *manual* (Figure *201*).

7.1.3.1 Georeferenced

Georeferencing means the attribution to a datum of information relating to its geographical location, in relation to a particular geodetic reference system. A georeferenced model is therefore understood as a model that contains the useful information to position it correctly. When this document type is placed on the map it will carry this information with it, so we will simply select the coordinate system used during its creation.

The operation of choosing the reference system takes place directly through the integrated browser. Therefore, by clicking on the screen icon (arrow 1 Figure *202*), the model is displayed.

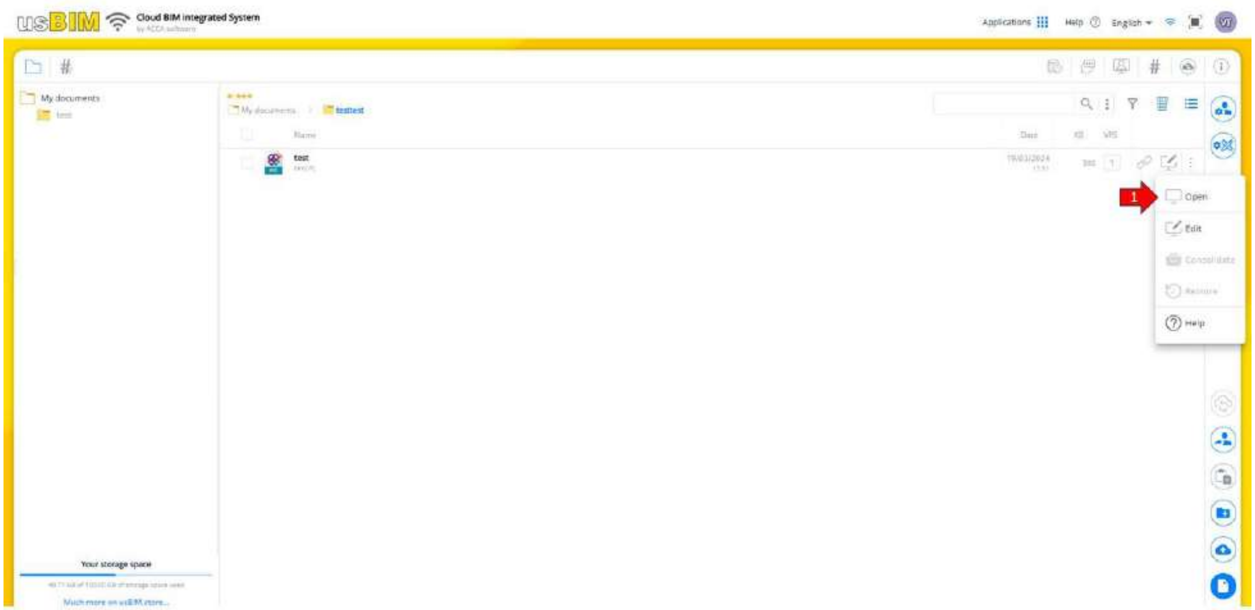

Figure *202. View the Model*

Once the model has been opened via browser, by accessing the "Georeferencing" section (arrow 1 Figure *203*), to insert it in the geospatial context, write the reference coordinate system to be used in the appropriate line. The method of entering the reference system must be done in the format "epsg:"*ReferenceCode*where the reference code is one of those present in the EPSG (European Petroleum Survey Group) repository, e.g. "*epsg:4326*" (arrow 2 Figure *203*).

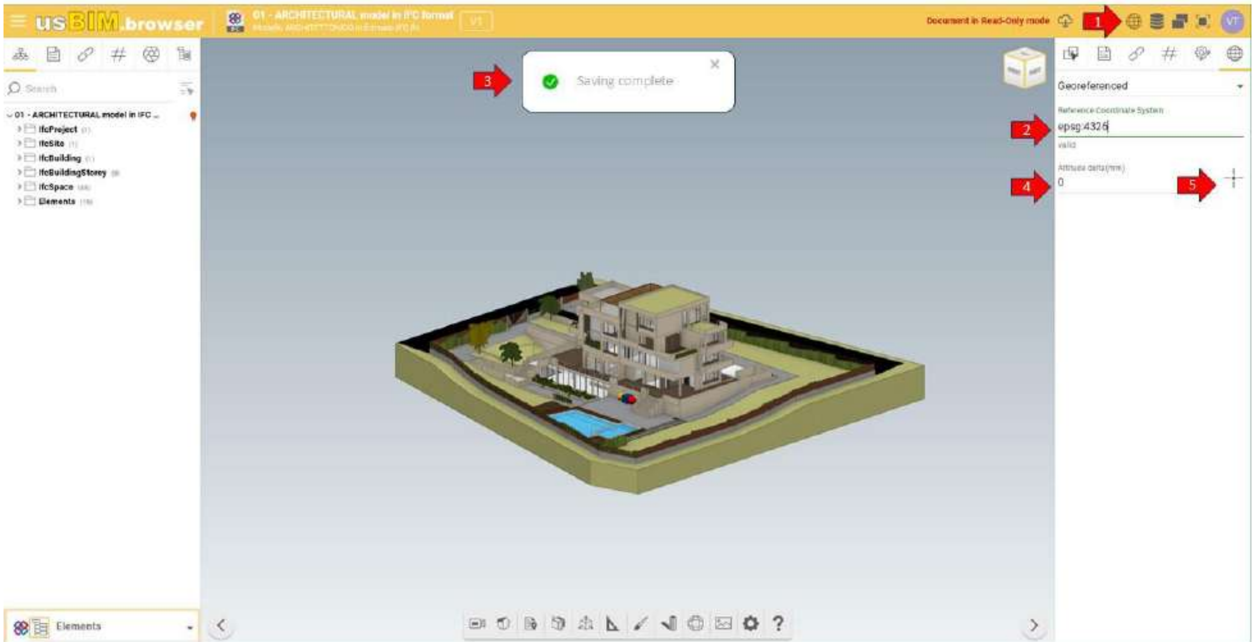

Figure *203. Georeferenced model*

If the reference system entered is valid, a "Save completed" message will appear as shown in Figure *203* arrow 3, otherwise when an incorrect reference system is written, a message will warn us that the insert system is not valid. In addition to the reference system, in this phase, it is also possible to define the delta altitude (arrow 4 Figure *203*) or reposition the survey point on the model (arrows 5 and 6 Figure *203*).

7.1.3.2 Manual

The other procedure for georeferencing a BIM model is based on manually entering (arrow 2 Figure *204*) the Latitude and Longitude coordinates (arrow 3 Figure *204*). Before entering this information, however, it is necessary to identify the survey point (blue cube) and its orientation (red sphere) on the model (arrow 7 Figure *204*). These two information are represented on a 2D map through a blue square and a red circumference (arrow 6 Figure *204*).

It is therefore necessary to proceed as follows:

1. Select "Reposition the survey point" (arrow 5 Figure *204*) and click with the left mouse button at the point in the model where you want to place it
2. Orient the survey point by clicking on the red sphere and then releasing it, in a point of the model

Afterwards, you can always reposition the two points by clicking with the left button on the cube or ball and using the handle.

At this point, established vertex and orientation on model, you must position them on the map to georeference them. There is a double option:

1. Enter Latitude and Longitude manually (at the Survey Point and in the Direction) (arrows 3 and 4 Figure *204*)
2. Click on the blue square (Survey point) on the map and, holding down the left mouse button, bring it to the desired point. In the same way, proceed with the red circle (Direction) (arrow 6 Figure *204*). To facilitate the positioning of the points, you can zoom in with the scroll of the mouse or search for the desired address using the appropriate bar.

In this second case, the information relating to Latitude and Longitude are updated automatically.

Figure *204. Manual Georeferencing*

7.1.4 Data management

By accessing the data management context menu (Figure 205), we have various functions that allow you to:

- copy data from an inactive version: #TagBIM, links, annotations, visibility, transparency and colours;
- delete the data added to the model: #TagBIM, links, annotations, visibility, transparency and colors;
- export data added to the template in CSV or Excel format.

When it comes to #TagBIMs it is possible to export them grouped or in full.

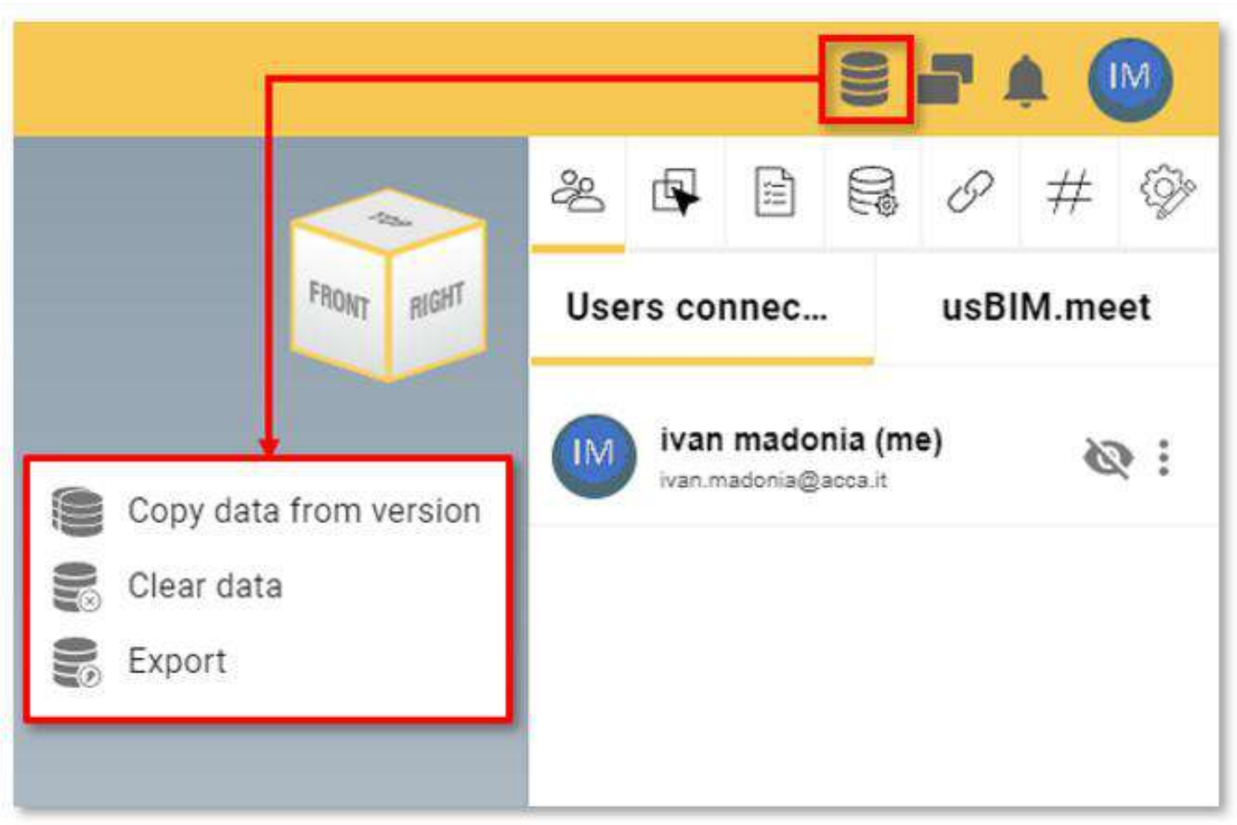

Figure *205. Data Management Menu*

7.1.5 #TagBIM on BIM model entities

It is also possible to define, associate and filter the #TagBIM metatags in usBIM.browser, thus being directly associated with the objects of the IFC model becoming information that enriches the 3D model enabling powerful graphical filters.

Figure *206. Inserting #TagBIM metatags in usBIM.browser*

The procedure for inserting #TagBIM keywords into the 3D model consists of selecting the #TagBIM function (arrow 1 Figure 206) from one or more objects selected in the model: in this regard, the object selection can be made directly on the model. By holding down the Ctrl key, we can select a group of entities or by referring to the IFC tree node structure, we can select one or more groups of objects by holding down the SHIFT key. Just like for the #TagBIM metatags on documents, you can also define new #TagBIMs (arrow 2 Figure 206) or edit them (arrow 3 Figure 206).

Figure 208 displays the appearance and operation of the Tag Filter section. This section provides the user with a list of #TagBIMs defined during the editing phase. In this way, the same value assigned to the Tag becomes a search key, so it allows to find and select the objects of the model tagged in the same way.

Figure *207. Tag Editor pop-up Window*

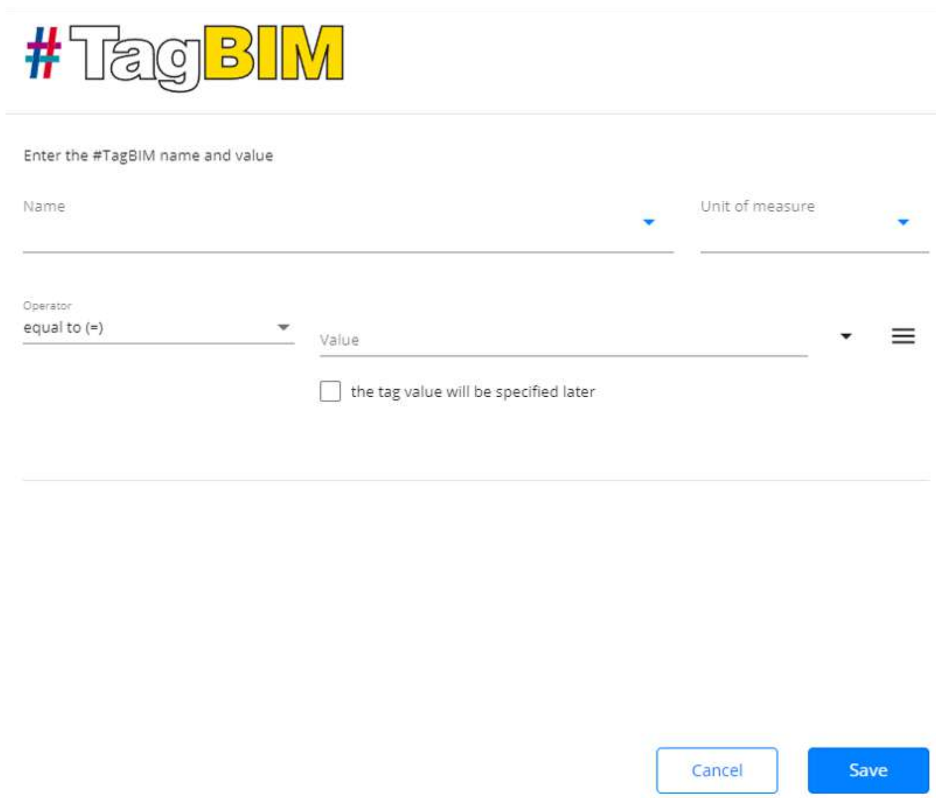

Figure *208. Inserting a new #TagBIM*

Figure *209. #TagBIM Filter*

7.1.6 Adding links to the BIM model

The use of open formats preserves the use of information over time and allows to update the model during any phase of the process of creation or maintenance of the asset. In particular, it is possible to add information directly to the model or even within technical drawings. These options allow you to create logical links between the digital model and the documentation on the platform or with material from outside or to associate additional information.

7.1.6.1 Links to documents

Here are the steps to associate links to documents that are located within the platform with the objects of the model displayed in usBIM.browser. As a first step, you must select one or more elements in the model with which you want to associate relevant documents4. After completing this first step, you can go to the usBIM.platform document that you want to link and use the Drag & Drop (Figure 210) function.

[4]If no objects are selected in the 3D model, when the document link is dragged, the system will return the message "To associate a link you must first select an object".

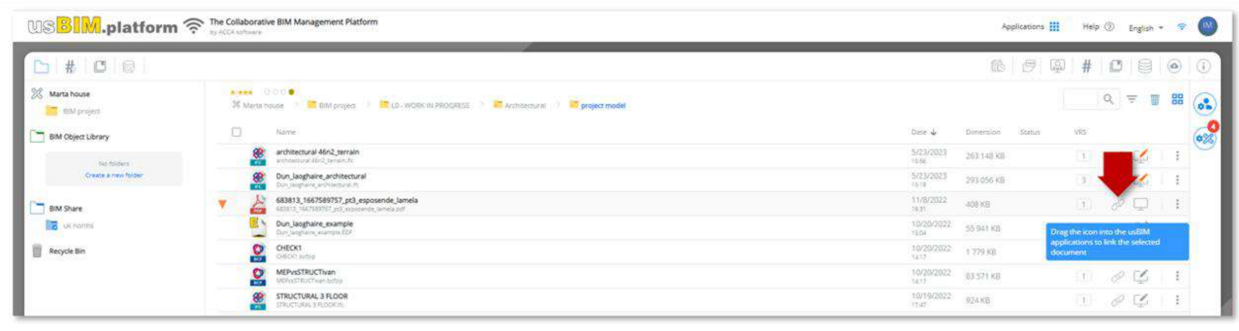

Figure *210. Drag & Drop to link documents in usBIM.browser*

After dragging the document to the dashed area shown in Figure 211, the document is then associated with the selected objects. By hovering the mouse cursor over the attached document (in the example, a PDF file) a preview is shown (arrow 1 Figure 212). The attached document can be renamed (arrow 2 Figure 212) or even disassociated from the template object (arrow 4 Figure 212); finally, through the GoTo function (arrow 3 Figure 212) the linked document can be located within usBIM.platform (Figure 214).

Figure *211. Dragging and Dropping a document*

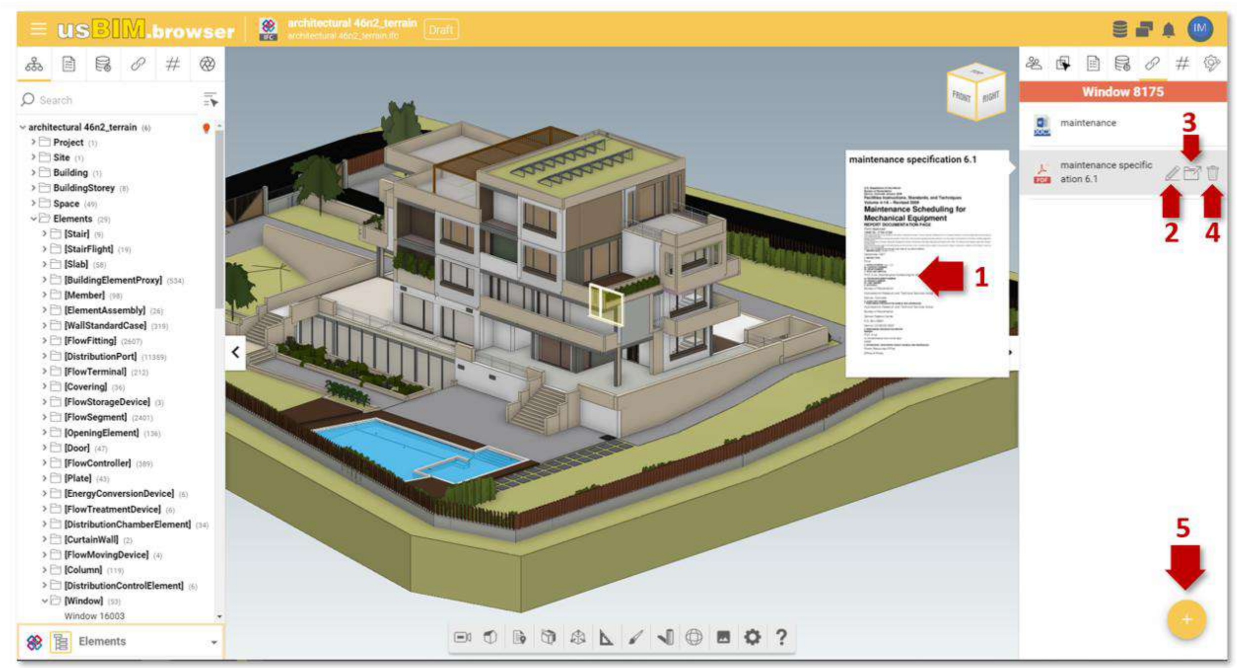

Figure *212. Document associated with objects in the 3D model*

It is also possible to associate a new link to the object by selecting the button on the right of the screen (arrow 5 Figure 212). At this point, two options are possible:

1) Add from usBIM.platform (arrow 1 Figure 213): this will open a window that shows the project folders in which the documents are stored. You must select the folder and document and then click Open.

2) Add from web link: it consists of copying the link of the document to be attached in usBIM.platform; then, in usBIM.browser the IFC entities will be selected. Finally, go to the "Documents" tab (arrow 13 Figure 233) 7.2.1, described in par., and press the "Link document" button (arrow 2 Figure 213): in the pop-up you can name and paste the URL. This second option does not directly link the document, but only the URL of the document uploaded to usBIM.platform.

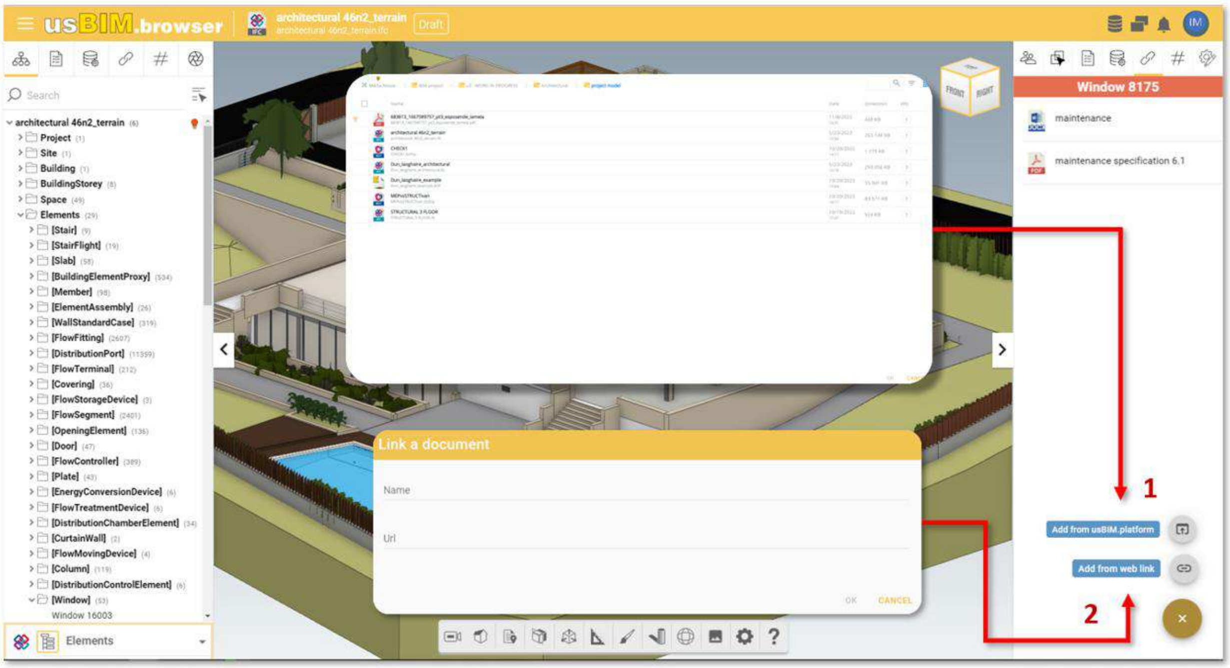

Figure *213. Adding Links from the web and from usBIM.platform*

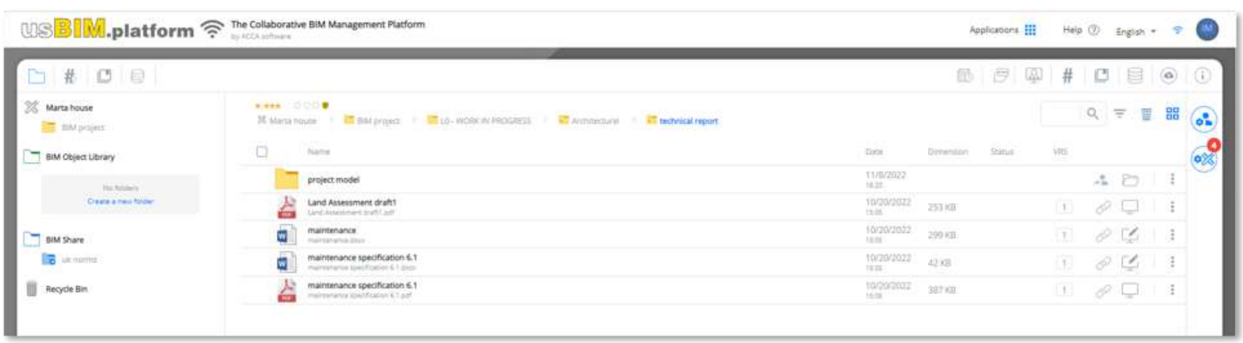

Figure *214. Document localization in usBIM.platform for which a link has been created in the 3D model*

7.1.6.2 Object Links

Using links allows you to dynamically trace both the three-dimensional entities and the information attached to them. For example, by opening the structural model and selecting a column (Figure 215), it is possible to trace the reinforcement details processed in the form of a technical drawing (Figure 216).

By opening the reinforcements details it is possible to connect the digital model entity to the construction drawings in a two-way connection by simply using the Drag & Drop function.

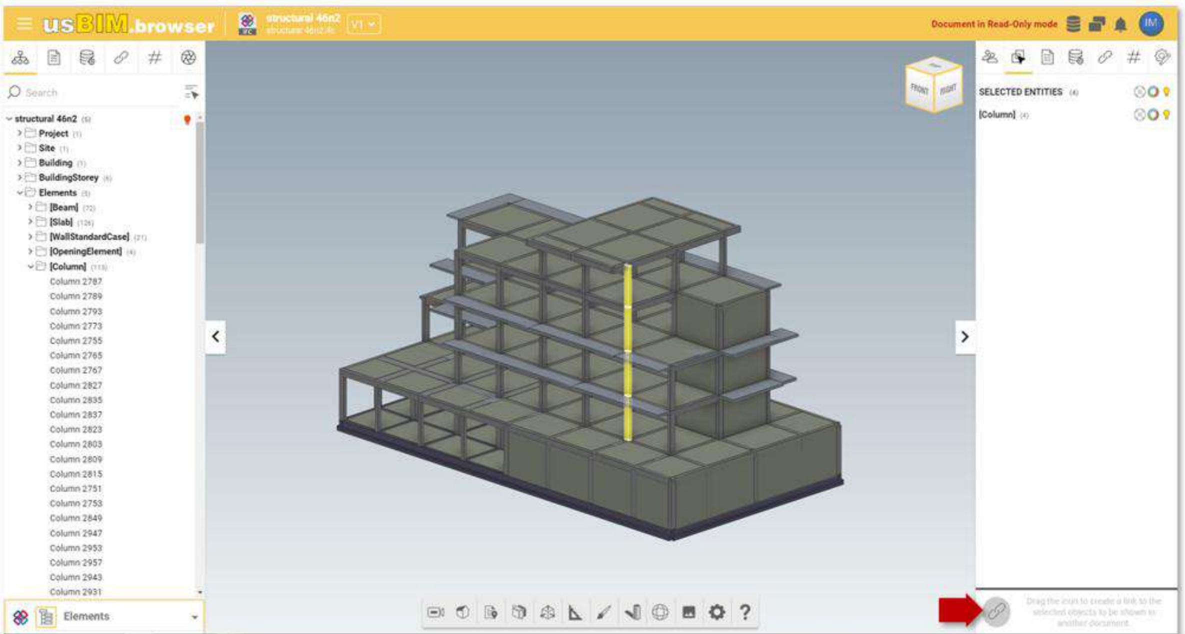

Figure *215. Drag & Drop to associate model entities with the construction drawings*

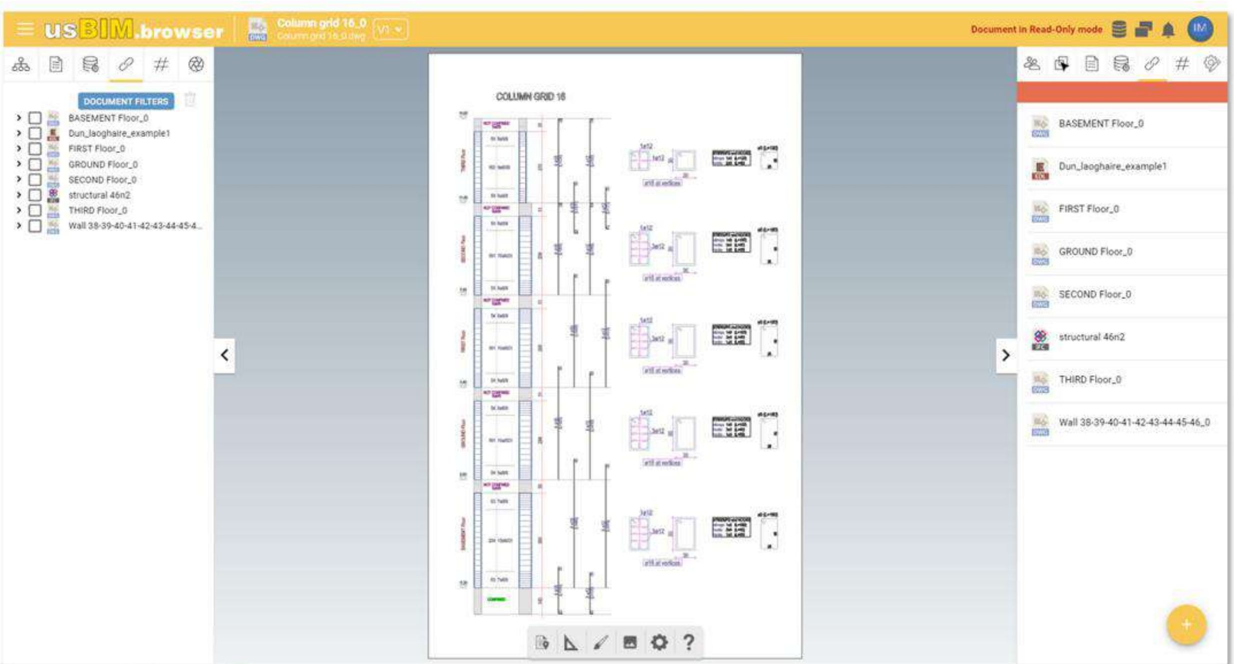

Figure *216. Detail of the column connected to the entity of the digital model*

You can now see that the reinforcement detail is connected to the digital model. By clicking on the structural model (arrow Figure 216) we can go directly to the model entity (Figure 217). In this way, with a few clicks you can browse and navigate the model from multiple angles.

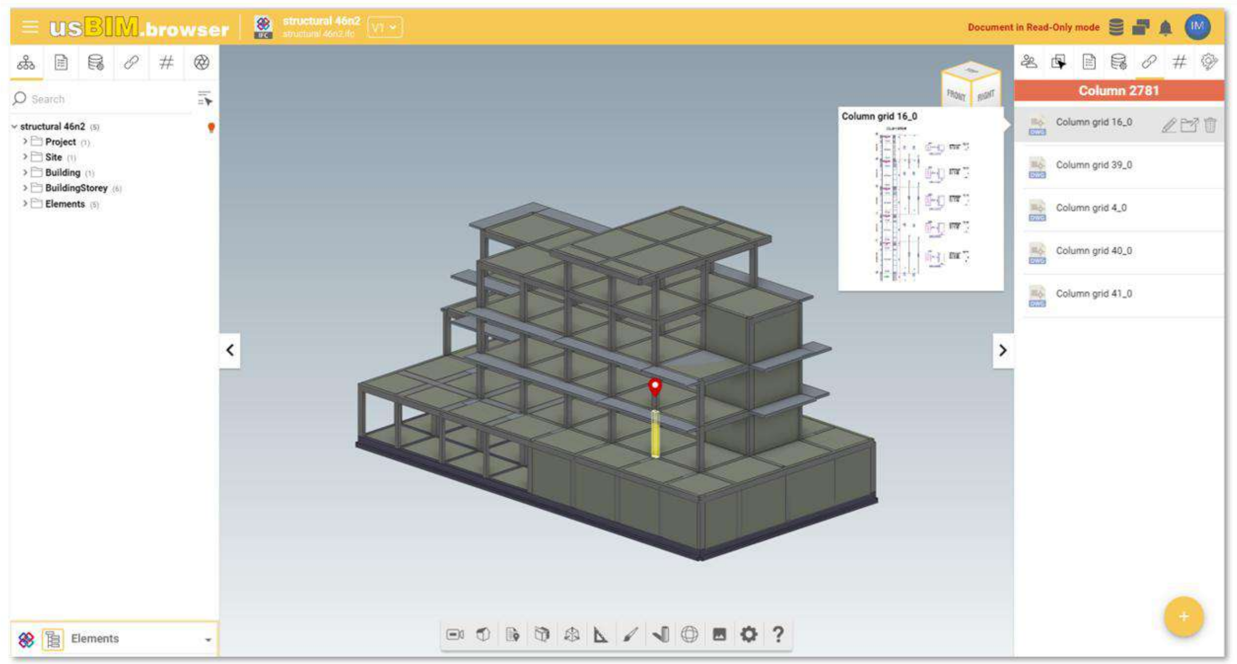

Figure *217. Model entity linked to the construction documents*

7.1.7 Direct link to the model

Starting from a web page, select the URL within the browser and drag it directly into the 3D model: usBIM.browser then uses different markers depending on whether they are generic links or video links (e.g. youtube). As shown in Figure 218, it is also possible to delete the annotations entered using the specific function.

Figure *218. Links within the model*

7.1.8 Management of observations

In usBIM.browser, we have an extensive set of collaborative working features that are available to users connected simultaneously on the same project in order to work together on a shared document on the platform. These collaborative working and simultaneous access operations give the possibility to optimize the production of a model.

The main page is composed as described in Figure 219.

[1] usBIM.resolver: function for highlighting any problems encountered within the design documents or for adding textual notes or graphics indicative of an activity to remember.
[2] Connected Users: it displays users who are connected to the project at the same time.
[3] Messages: direct communication with users collaborating on the project.

Figure *219. Features for collaborative work of usBIM.browser*

7.1.9 usBIM.resolver

Creating tasks to manage critical issues found on documents or models within usBIM.browser offers the opportunity to collaboratively solve project documents. By opening the context menu (arrow 1 Figure 219) we find the section dedicated to usBIM.resolver (arrow 2 Figure 219).

For each issue found, it is possible to open task dedicated to its resolution. Clicking on the “Add Task” button (arrow 1 Figure *220*) will open a window where you can add a Title to the Task (arrow 1 Figure *220*), a description, a possible due date and index it according to Step, Status and Priority.

For these activities it will be possible to:

- assign a status (arrow 2 Figure *220*), which can be
    - **DRAFT:** the Topic/Task is being processed;
    - **TO DO:** the Topic/Task is to be considered to be resolved;
    - **IN PROGRESS:** Topic/Task is being processed;
    - **COMPLETED:** Topic/Task completed and awaiting verification;
    - **CLOSED:** Topic/Task completed and verified.
- assign a priority (arrow 5 Figure *220*)

- critical
- urgent
- high
- average
- low

- define a due date by which to the Task should be completed (arrow 3 Figure *220*);

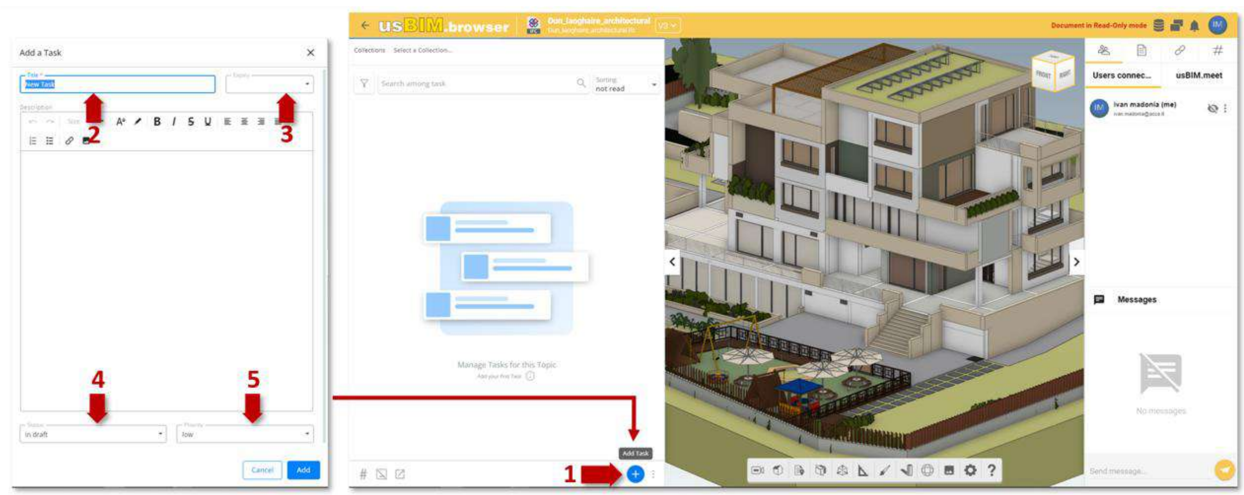

Figure *220. Task Section*

usBIM.browser also allows you to enrich Task descriptions with graphical annotations. In fact, using dedicated tools (arrow 1Figure *221*), you can insert text markups or shapes, for example to describe the instructions to be followed on the graphical model or highlight an exact point where to intervene.

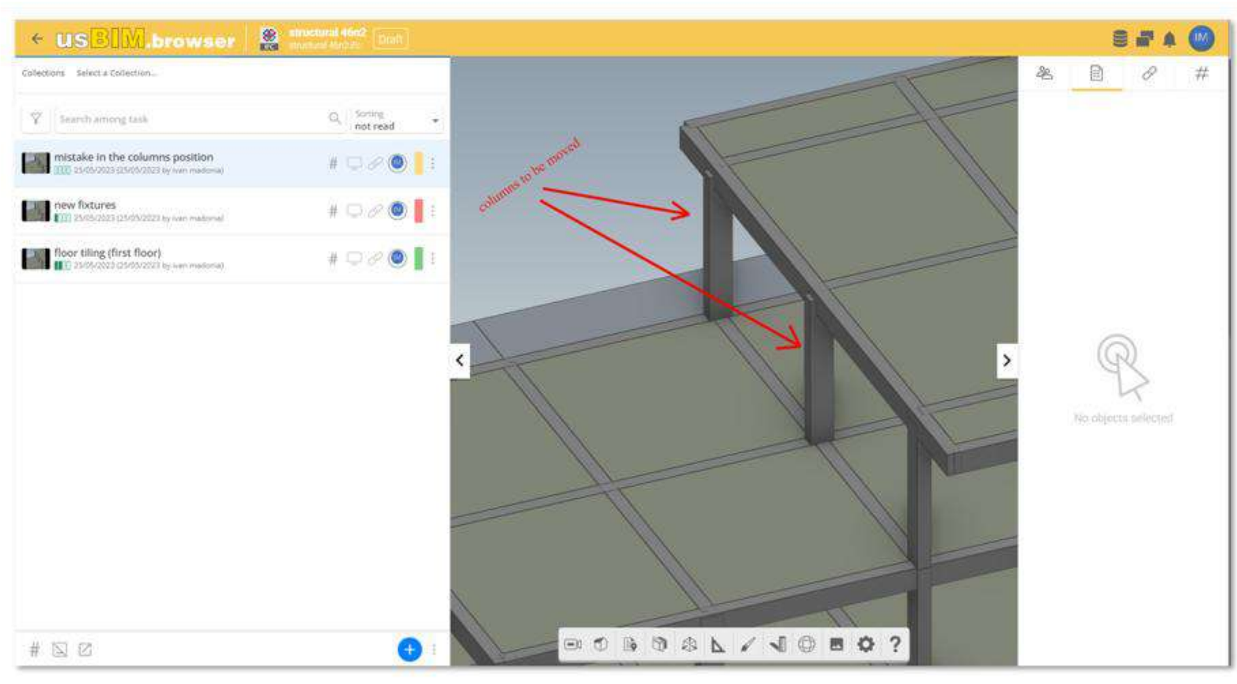

Figure *221. Task creation scene*

Once the Task has been created, you can assign its resolution to a colleague. To add new participants, click on the "Participant Management" button (arrow 3 Figure *222*) accessible from the context menu of the Task and enter, in the appropriate bar, the email address of the user we intend to add.

You can also edit the Task at any time, from the same context menu click on "Edit Task" (arrow 2 Figure *222*). To delete the Task click on the “Delete” button (arrow 5 Figure *222*). In addition, clicking on the Chat button (arrow 4 Figure *222*) will open a modal window dedicated to the Chat associated with the Task (Figure *224*).

The user views the Task details (arrow 1 Figure *222*) and finds all the information necessary to perform the document verification task, with descriptions and comments.

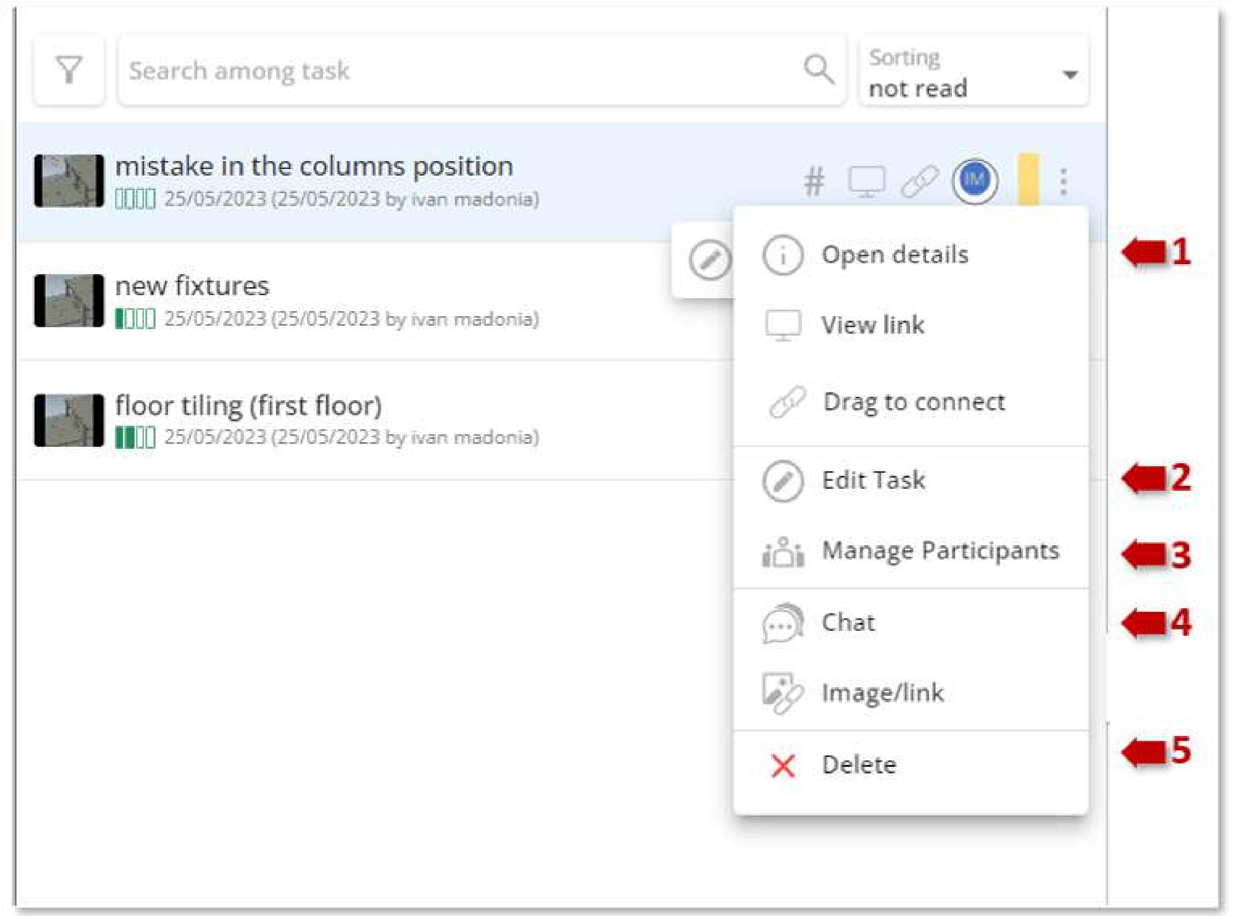

Figure 222. *Task Context Menu*

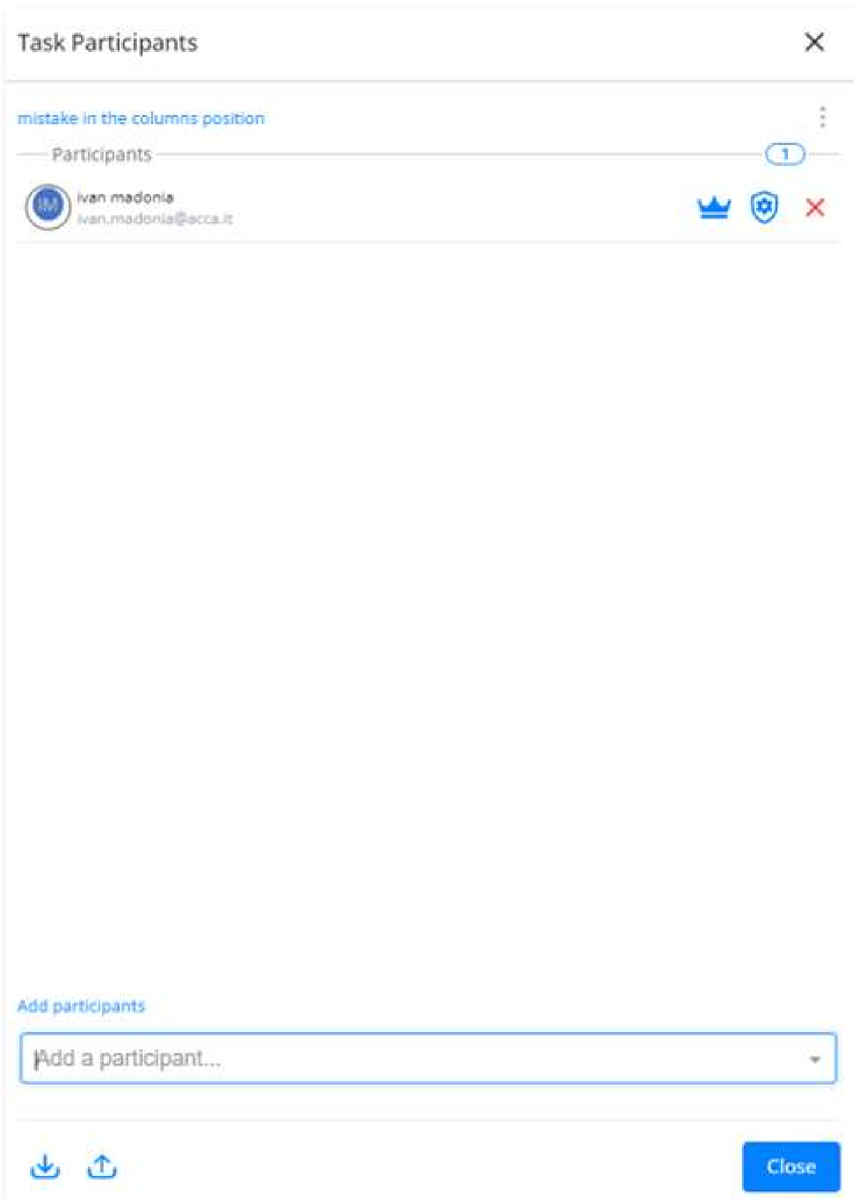

Figure *223. User Management*

Figure 224. Chat

7.1.10 Collaborative work

Thanks to this feature, other users connected to the document can work on the same model after receiving the notification of the user connected to the document Figure *229*. These same users will have the ability to work simultaneously. By clicking on the menu, (Arrow 1 Figure 225), you can show your avatar to other colleagues connected to the same document. After enabling the avatar, the grey eye icon will turn to red (Arrow 2 Figure 225).

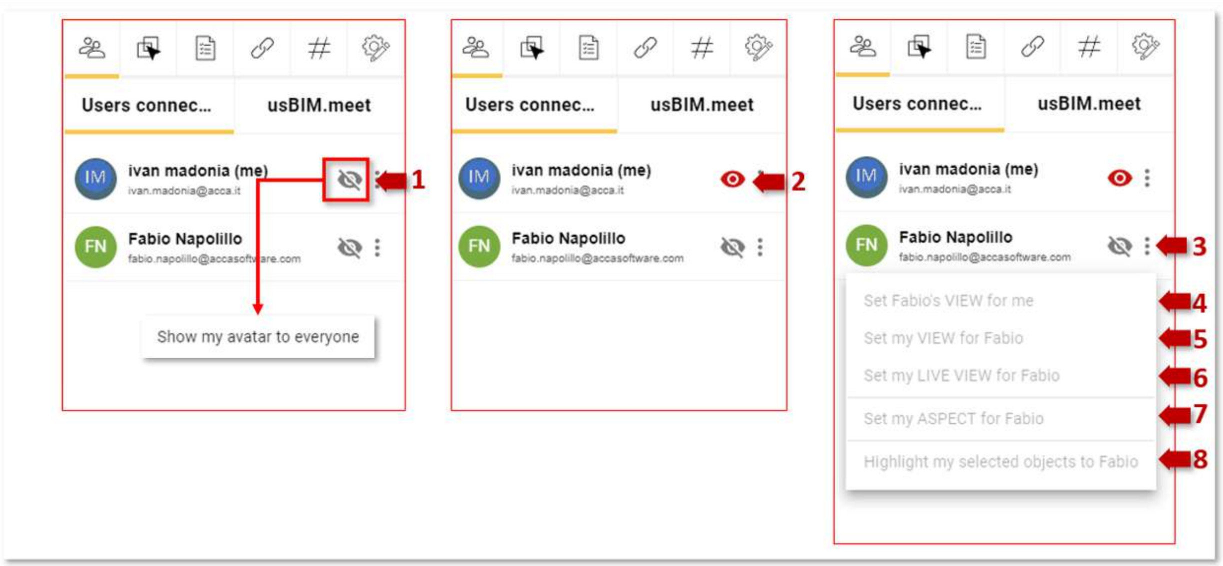

Figure *225. View my avatar*

With the avatar enabled, from the menu (Arrow 3 Figure 225) you can do a number of things.

- set the other connected user's view (Arrow 4 Figure 225);
    - in this mode, you can set your view as per the connected user's model view
- Configure your own view for the connected user (Arrow 5 Figure 225);
    - In this mode, the connected user can see the collaborator' shared viewpoint of the model
- Set your own Live view also for the other connected user (Arrow 6 Figure 225);
    - In this mode, the connected user can see a Live view of the the model being shared
- set the model appearance in other users view (Arrow 7 Figure 225).
    - In this mode, connected users can see the graphical appearance (e.g. changing object colours) of the shared model Figure 226
- highlight selected objects in other users view (Arrow 8 Figure 225);
    - this mode allows you to share the view of the selected objects on the model also to other connected users, Figure 227

Figure *226. Set my view*

Figure *227. Highlight my selected items*

7.1.10.1 Logged in users

Multiple users can be connected to the same project at the same time. The user is displayed on the screen specified in Figure 219 Arrow 2.

7.1.10.2 Messaging

Thanks to the instant messaging service in the browser (arrow 3 Figure 219), you can also communicate to have an immediate comparison on the work with all the users connected to a project. To facilitate collaboration, it is possible to use the features provided by usBIM.browser for the visibility and coloring of model entities (cfr. par. 7.2.1 Figure 234).

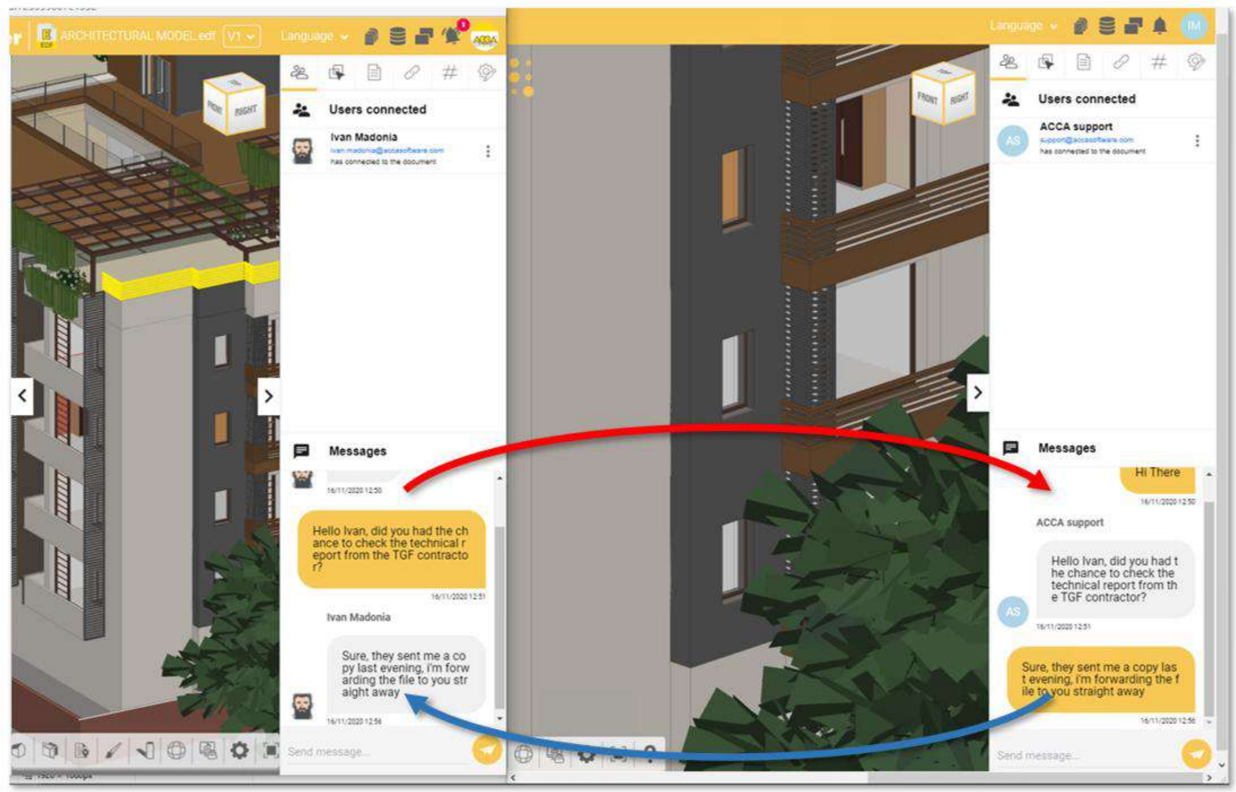

Figure *228. Instant Messaging*

7.1.11 Notifications

By accessing this section (Figure 229), the users connected to the project view the notifications related to all the operations carried out on the model through the usBIM.browser service (e.g. connection or disconnection from the model, addition of a topic, etc.). The system indicates the progressive number of notifications by reporting it on a red badge and simultaneously issues an audible notification.

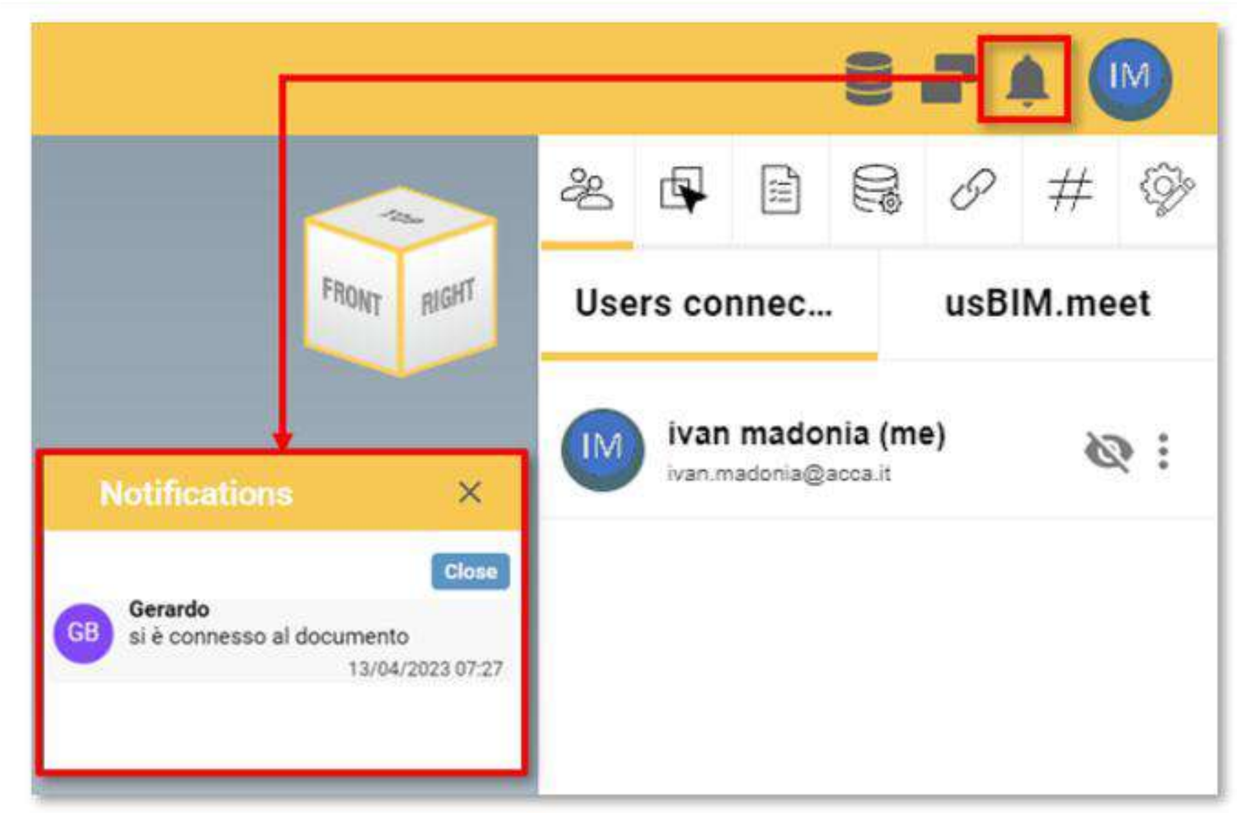

Figure *229. Notification in usBIM.browser*

7.1.12 Applications

Using the "Applications" tab (key 5Figure 233) you can create API links (acronym for Application Programming Interface) to allow you to connect the model with other products or services. For example, it is possible to connect the real-time video transmission of the physical webcam located in the same position as the webcam object in the model. This could be for video surveillance reasons or to manage the building's home automation.

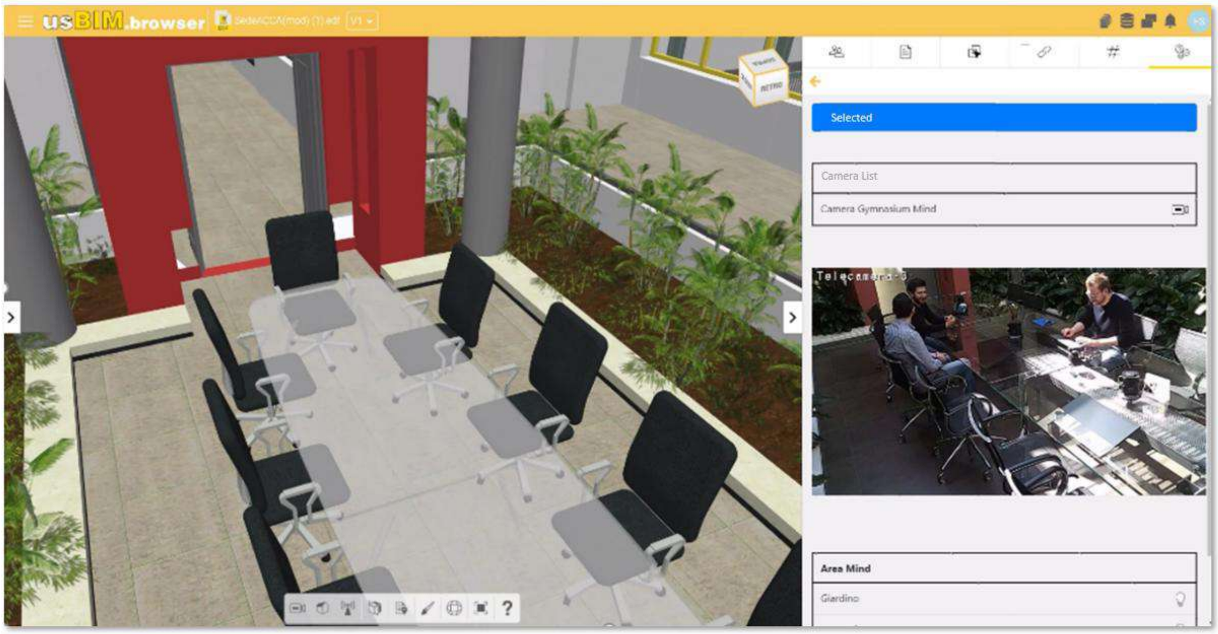

Figure *230. Example of API connection with an IFC model (a)*

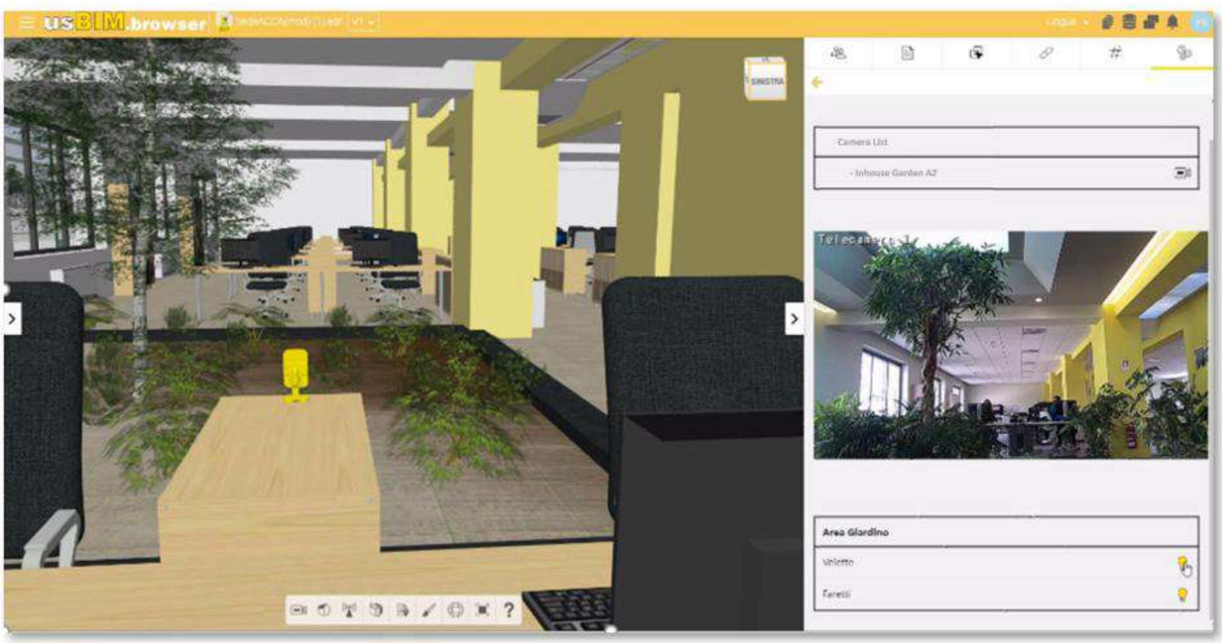

Figure *231. Example of API connection with an IFC model (b)*

7.2 IFC Format

7.2.1 Opening an IFC file in usBIM.browser

From the screen that shows the project documents grid, by clicking on the view button (Figure 232), you can open documents in the various formats managed by usBIM.browser, as described in the previous paragraph.

The main page is composed as described in Figure 233.

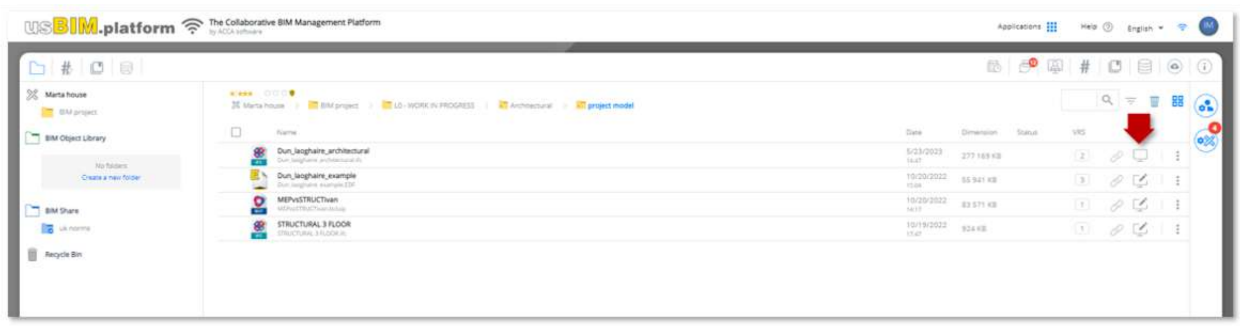

Figure *232. Project Documents Sheet*

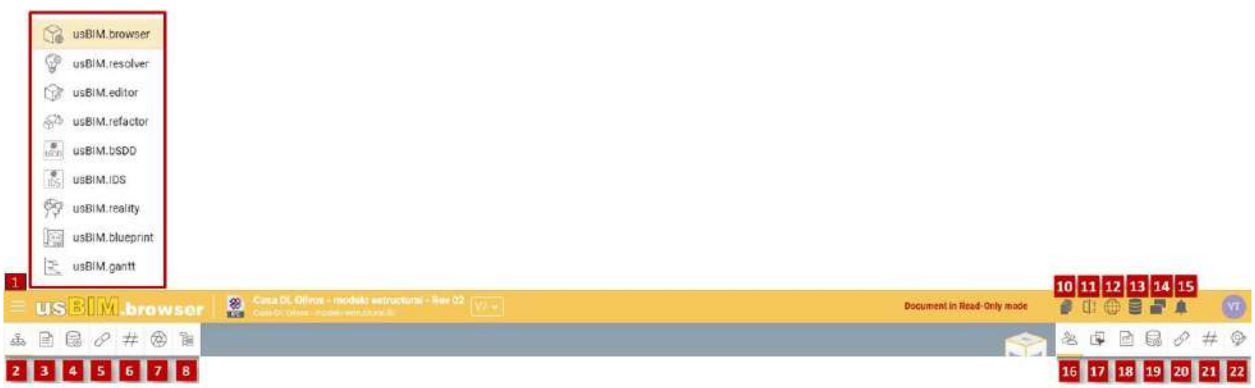

Figure *233. Home of usBIM.browser when opening a model*

[1] **Menu**: allows access to applications that can be integrated into the CDE
[2] **IFC Structure**: it shows the IFC tree structure.
[3] **Property Filter**: it allows you to filter model entities through IFC properties.
[4] **usBIM.data filter:** from here you can set search filters based on usBIM.data sheets.
[5] **Document filters**: it allows you to view document links associated with the model.
[6] **Tag Filter**: from here you can set the search filters based on the #TagBIMs entered.
[7] **View:** saves the model views.
[8] **Selection groups:** allows you to create selection groups to filter the entity in the model.

[9] **Version management:** from here you can change the version of the opened model. This operation is not applied to the folder where the document is stored.
[10] **Federations**: allows you to select a federation where the document is present.
[11] **Compare document**: allows you to import a document and compare it with the one displayed.
[12] **Georeferencing**: allows you to attribute to a model information relating to its geographical location, in relation to a particular geodetic reference system.
[13] **Data management**: it allows you to manage all information added and changes made to the document thanks to the use of usBIM.browser.
[14] **Duplicate Screen**: this feature allows you to open multiple browser screens at once.
[15] **Notifications** icons: it shows new notifications to be read
[16] **Connected users**: specifies the number of connected users on the project.
[17] **IFC Properties Tab**: This section shows the IFC properties of the selected objects.
[18] **Property Tab**: it shows the selected IFC entities.
[19] **usBIM.data tab**: section for associating data with the document.
[20] **Documents Tab**: section that highlights the presence of any links associated with the objects and that allows you to add information to the model itself by associating links to documents that are present both inside the platform and outside.
[21] **#TagBIM Tab**: section for inserting #TagBIMs on 3D model objects.
[22] **Applications**: Section for creating API links (acronym for Application Programming Interface) to connect the model with other products or services.

Figure *234. Viewing the IFC Tree structure and Object Properties*

The Figure 234 shows how the IFC file tree structure (arrow 1 Figure 234) and the IFC model properties (arrow 3 Figure 234) are displayed. As specified by arrow 1 (Figure 234), in the IFC tree you can enable/disable the display of IFC objects in the 3D model, change the transparencies and change the colors; in the right section, indicated by arrow 3 (Figure 234), after selecting an IFC model object, you can consult its properties. The usBIM.browser "Features Panel" (Arrow 2 Figure 234) is the section dedicated to the various features made available by the service, described below; By clicking on the section at the bottom left (Arrow 4 Figure 234) you can change the type of display of the IFC structure of the model.

Figure *235. Viewing Features Panel*

Opening a model with usBIM.browser (Figure 235), we immediately find the usBIM.browser functionality panel Service composed as follows:

Camera: Orbit, First Person. With the "Orbit" function you can rotate the model around a point, while the "First Person" option allows you to navigate the model in all its parts both with the mouse buttons and with the keyboard arrows. To use the "First Person" mode, select the perspective view (point 2).

[2] **Camera Projection**: Orthographic, Perspective.

[3] **Annotations**: View All, Hide All, Links, Videos, Delete Annotations.

[4] **Sections**: None, Plan X, Plan Y, Plan Z. Possibility to create sections directly on the model

[5] **Box Section:** None, Box. Ability to create sections directly on the model

[6] **Measurements**: a function for linear measurements, angle measurements and surface measurements.

[7] **Appearance**: Geometry, Bounding Box, 2D Geometry.

[8] **Shadows**: Current date and time, Calendar, Clock, Compass, Latitude/Longitude. Using "Current date and time" the date and time used to cast shadows on the model is shown; with "Calendar", you can change the date while with "Clock", you can simply adjust the time. Using "Compass", the orientation of the model is adjusted and so is geolocation with "Latitude/Longitude".

[9] **Model rotation**: this function rotates the IFC model with respect to the axes.

[10] **Scene settings**: allows you to set the type view, either in 3D or in 2D.

[11] **Internal Screen Mode**

[12] **Help**: shows the basic commands for navigating the model with both the orbit function and the first-person function.

7.3 PDF Format

7.3.1 Opening an IFC file in usBIM.browser

From the screen that shows the project documents grid, by clicking on the view button (see par. 7.2.1 Figure 232), you can open documents in the various formats managed by usBIM.browser, as described in the previous paragraph. The main page is composed as described in Figure 236.

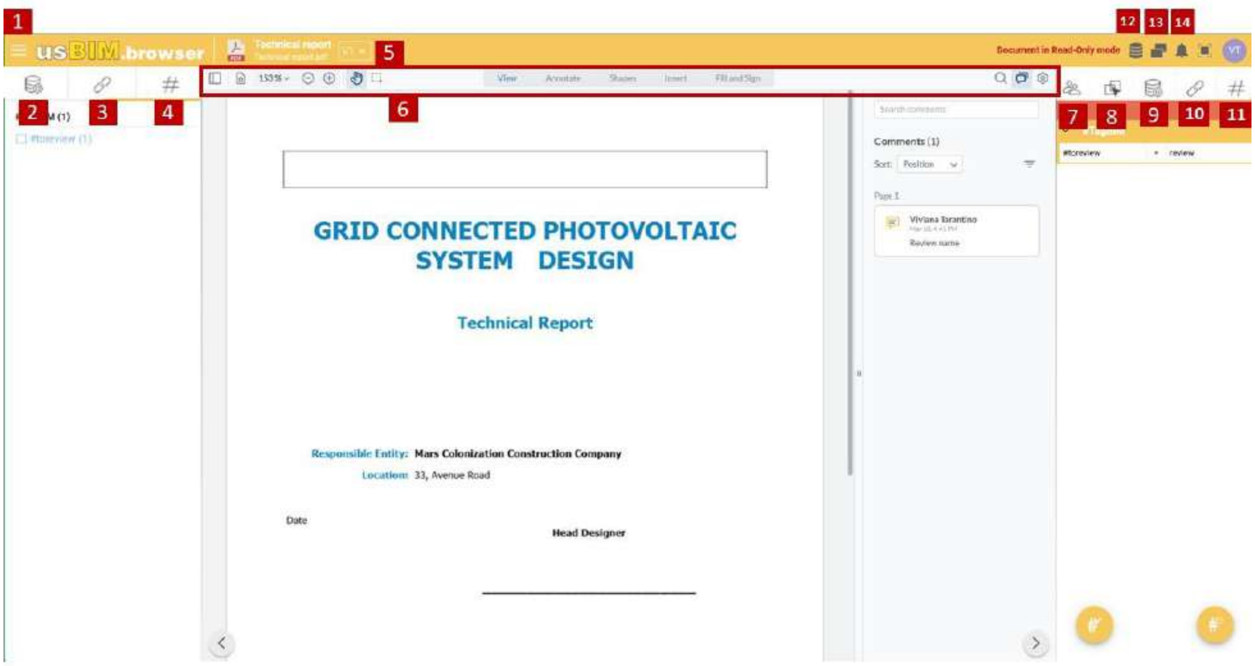

Figure *236. usBIM.browser page opening a PDF file*

[1] **Menu**: allows access to the usBIM.browser applications menu in PDF file format

[2] **usBIM.data filters**: allows you to view the search filters based on the forms within a model

[3] **Document filters**: allows you to view the links of the documents associated with the template.

[4] **Tag Filter**: from here you can set the search filters based on the #TagBIMs entered.

[5] **Version management:** from here you can change the version of the opened model. This operation is not applied to the folder where the document is stored.

[6] **Features panel: Features** panel of the usBIM.browser service with a PDF file

[7] **Connected users**: specifies the number of connected users on the project.

[8] **Selection**: gives the possibility to manage the display modes of the selected objects

[9] **Tab usBIM.data:** section that highlights the presence of any forms associated with the objects and that allows you to add data to the document itself by associating custom models to documents that are present within the platform

[10] **Documents Tab**: section that highlights the presence of any links associated with the objects and that allows you to add information to the model itself by associating links to documents that are present both inside the platform and outside.

[11] **#TagBIM Tab**: section for inserting #TagBIMs on 3D model objects.

[12] **Data management**: it allows you to manage all information added and changes made to the document thanks to the use of usBIM.browser.

[12] **Duplicate Screen**: this feature allows you to open multiple browser screens at once.

[14] **Notifications**: indicator of new notifications.

Figure *237. Features panel of the usBIM.browser service with a PDF file*

When opening a PDF document with usBIM.browser (Figure 237), a toolbox shows the following options:

[1] **View PDF structure**

[2] **Change display settings**

[3] **Change the zoom setting on the document**

[4] **Zoom out.**

[5] **Zoom in**

[6] **Pan.**

[7] **Area selection.**

[8] **View document.**

[9] **Annotate:** Create new annotations on the document.

[10] **Shapes:** Add new shapes to the document.

[11] **Insert:** Add new shapes to the document.

[12] **Signature:** Add new shapes to the document.

[13] **Search: Search** for words within the document.

[14] **Notes:** Create annotations and comments in the document .

[15] **Settings:** Customize PDF Viewer settings.

7.3.2 Managing the Index from Word Files

In order for a PDF file to be viewed and indexed in usBIM.browser, it must be saved properly. More specifically, user must use the styles provided by Microsoft® Word® to create an index within the text document (Figure 238).

Figure *238. Create the index in Microsoft® Word® using styles*

Once the writing phase has been completed, the user must first click on the "File" tab of the ribbon and from here press on "Save as" (Arrow 1 Figure 239); specified the path where he/she intends to save the document (as well as its title), he/she must set the extension (*.pdf) as the saving format (Arrow 2 Figure 239) and, subsequently, click on the "Options..." button. (arrow 3 Figure 239); in the pop-up that appears, first tick "Create bookmarks using" and then the "Headers" option (arrow 4 Figure 239); finally, click on "Save" (arrow 5 Figure 239).

In this way, the index section created in Microsoft® Word® (Figure 238) will be visible in full in the PDF document opened in usBIM.browser (Figure 240): this index allows you to switch from one paragraph to another dynamically, without the need to view the document in full.

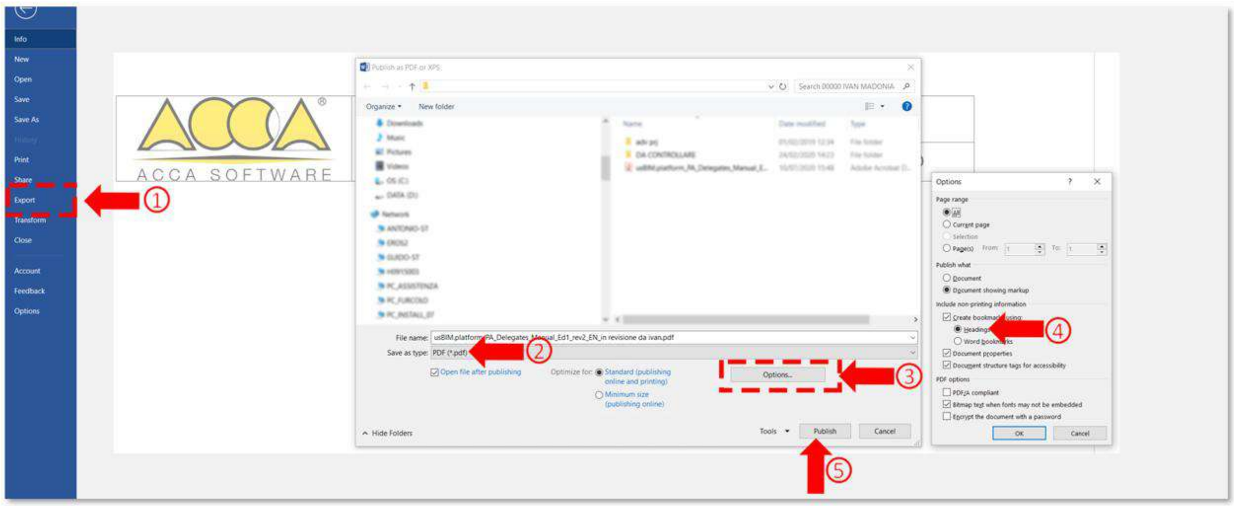

Figure *239. Saving a PDF with index from Microsoft® Word®*

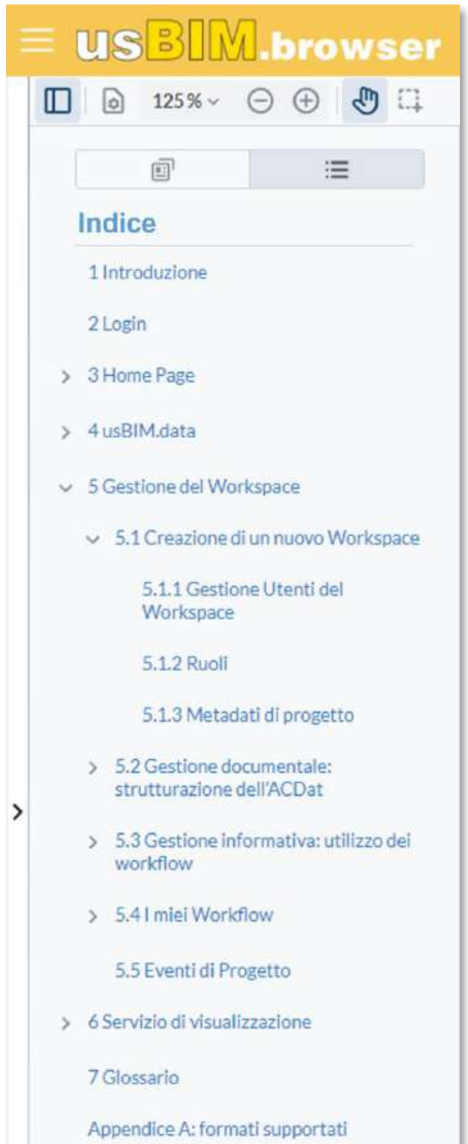

Figure *240. Index of the PDF document in usBIM.browser*

7.3.3 Comment creation

When managing documents in PDF format, usBIM.browser allows to create bookmarks on the document. A bookmark can be seen as a dynamic shortcut that allows you to quickly move from one section of the document to another, regardless of the structure of the index. It is also used to highlight the paragraphs, phrases or keywords of the document, which need to be easily accessible for the management and consultation of the document.

However, the usBIM.browser comment is not only a highlight of a part of the document but a real object that can, therefore, be equipped with #TagBIMs (see par. 7.3.4), be linked with other design documents on the platform (see par. 7.3.5).

In the features panel, you must select a shape, from those available, to add a comment. The comment created will be visible from the clipboard section (arrow 14 Figure *237*).

In the clipboard panel (Arrow 1Figure 241) , the list of all comments created in the document appears. Here you can make a comment selection (Arrow 2 Figure 241) in order to link a document (Arrow 3 Figure 241) or even assign them a common #TagBIM (Arrow 4 of Figure 241); using the keys (Arrow 5 of Figure 241) you can open the clipboard, edit it in the style or delete it.

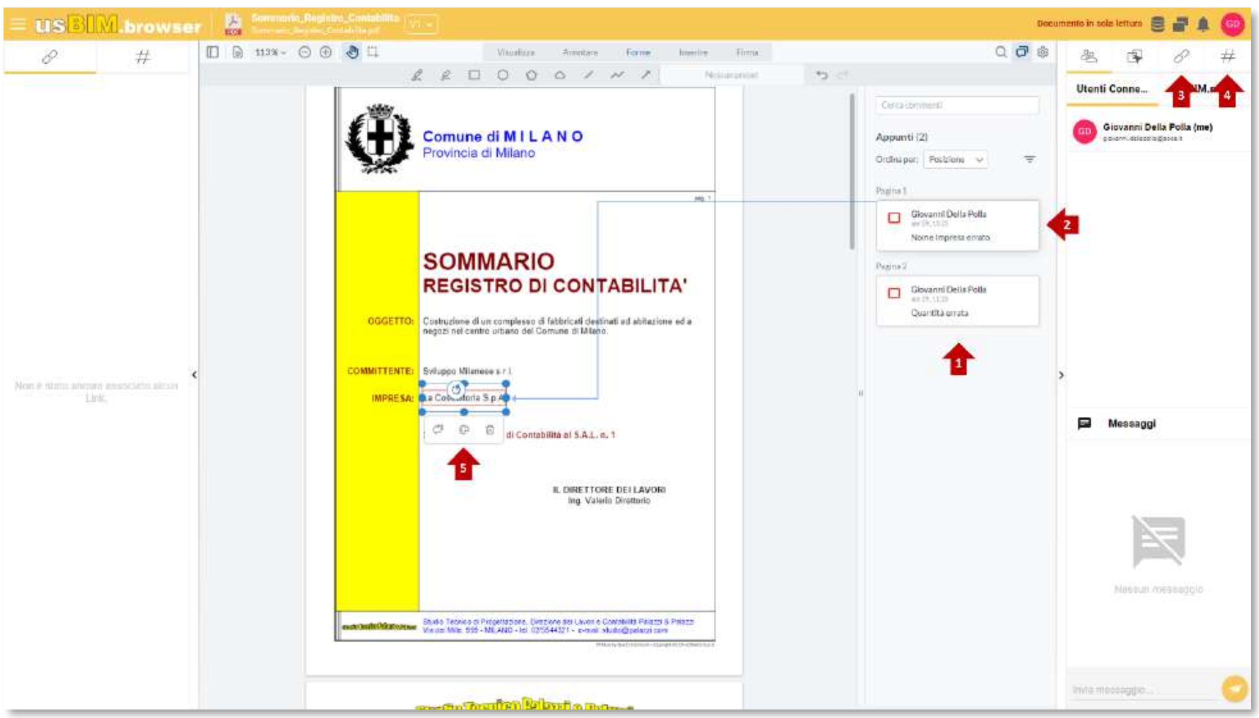

Figure *241. Editing a comment*

7.3.4 #TagBIM on PDF document and comments

In the same way as for an IFC document (see par. 7.1.5), it is also possible to define, associate and filter the #TagBIM keywords within the document itself and on the bookmarks created by the user, thus providing information that enriches the PDF.

The procedure for inserting the #TagBIM on a PDF document consists of selecting the #TagBIM feature (arrow 1Figure 242). Like #TagBIMs on documents, you can define new #TagBIMs (arrow 3Figure 242) or edit them (arrow 2 Figure 242).

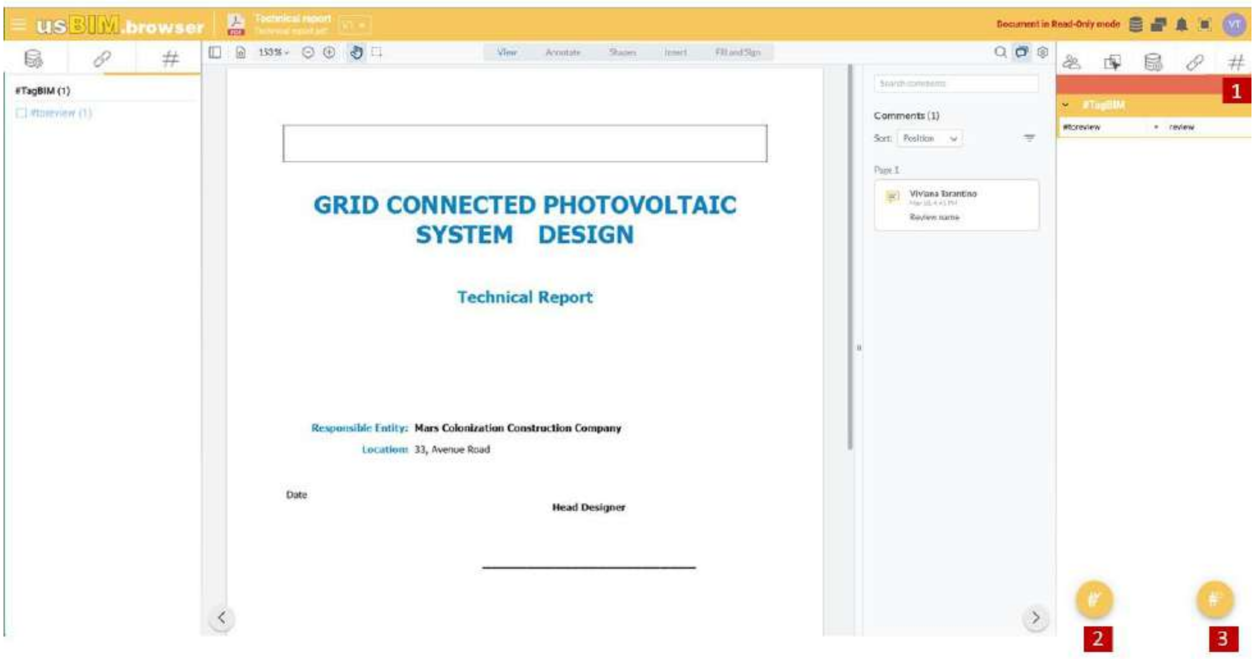

Figure *242. Creating #TagBIM sets of keywords within a PDF document*

The procedure for inserting the #TagBIM on the bookmarks (Figure 243) of the PDF document consists of selecting one or more bookmarks from the corresponding panel (arrow 1 Figure 241); from here you move to the #TagBIM section and proceed in the same way as said for the #TagBIMs on the document.

For a description of the appearance and operation of the Tag Filter section, please refer to content as described in chapter 7.1.5.

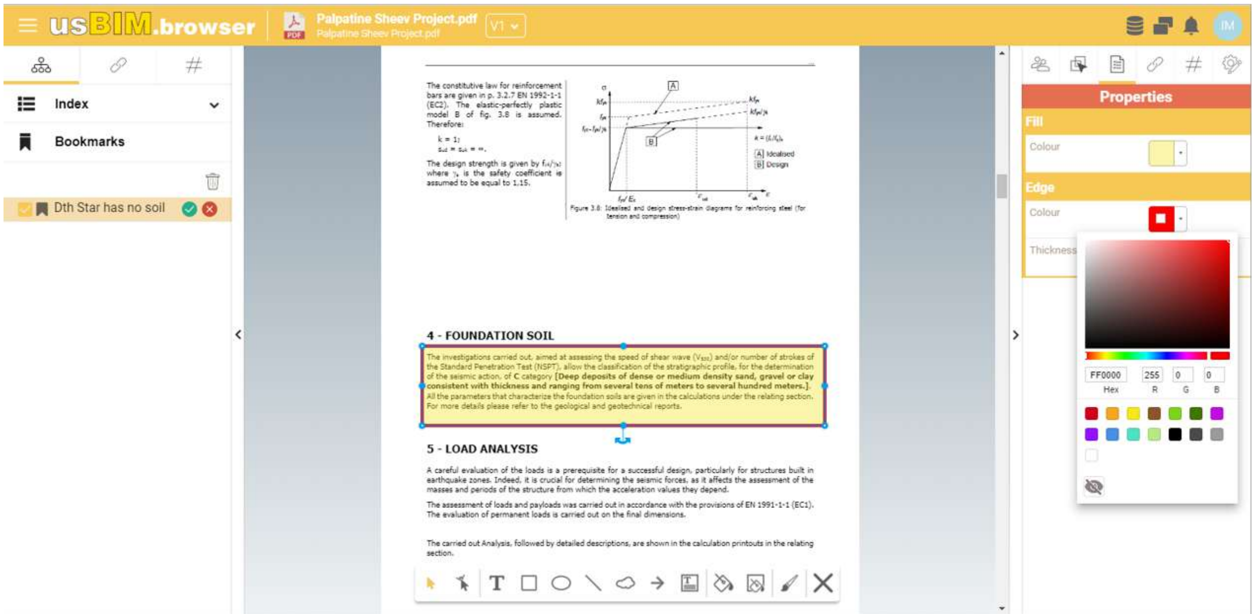

Figure *243. Creating #TagBIMs on a PDF document bookmark*

7.3.5 Adding links to the PDF document

7.3.5.1 Comments link

The following describes the procedure to associate a bookmark with links to documents, templates that are located within the platform and URLs, internal and external to usBIM.platform. As a first step, similarly to what is described in the paragraph 7.1.6.1, you must select one or more bookmarks in the PDF document. After the selection, you can go to the usBIM.platform document that you want to link and use the Drag & Drop function.

After you drag the document to the dashed area as shown inFigure 244, the document is associated with the selected bookmark. Hovering the mouse arrow over the attached document (in the example, a PDF file) activates a preview. The attached document can be renamed or even disconnected from the model entity; finally, using the GoTo function, the linked document can be located within usBIM.platform.

A second way to link documents to objects is to copy the link of the document to be attached; then, select the relevant bookmark and go to the "Documents" tab (arrow 13 Figure 236), described in par.7.3.1, and press the "Link document" button (arrow Figure 244): in the pop-up you can name and paste the URL. This second mode does not directly link the document, but the URL of the document uploaded to usBIM.platform.

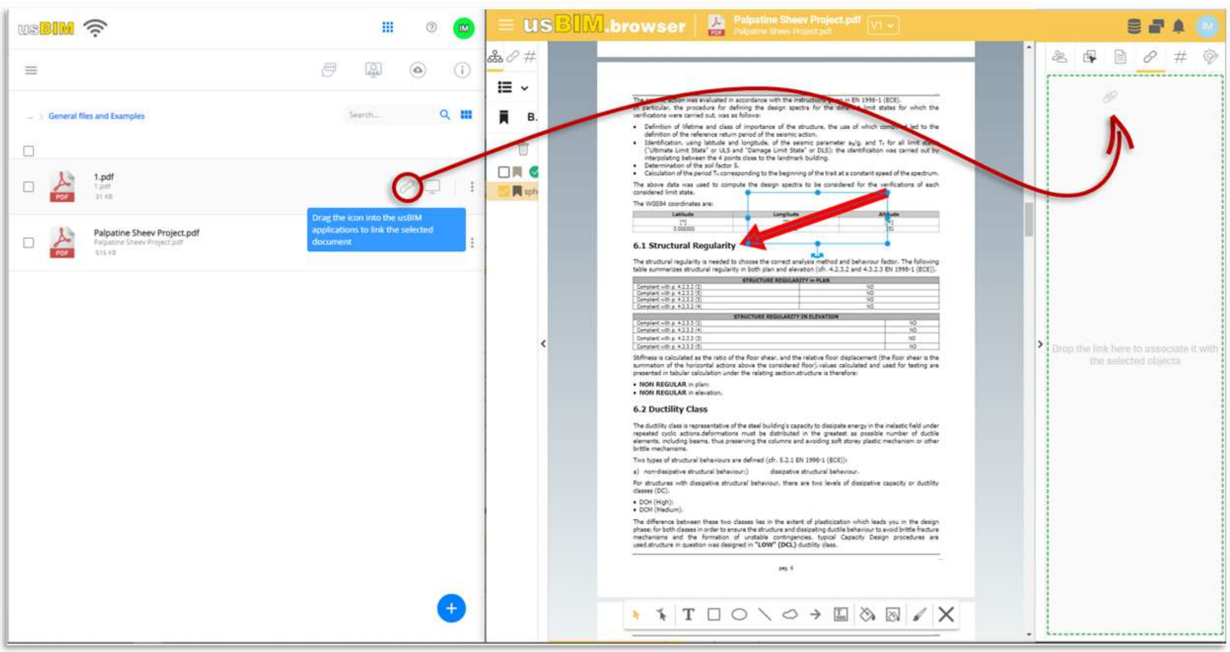

Figure *244. Link to a PDF document comment*

7.3.5.2 Direct link to the document

Similarly to what we have seen in the previous paragraph, links can be added to a PDF document, along with models that are located within the platform and website URLs. In this case, simply go to the usBIM.platform document that you want to link, and use the Drag & Drop function or paste the link URL (Figure 245).

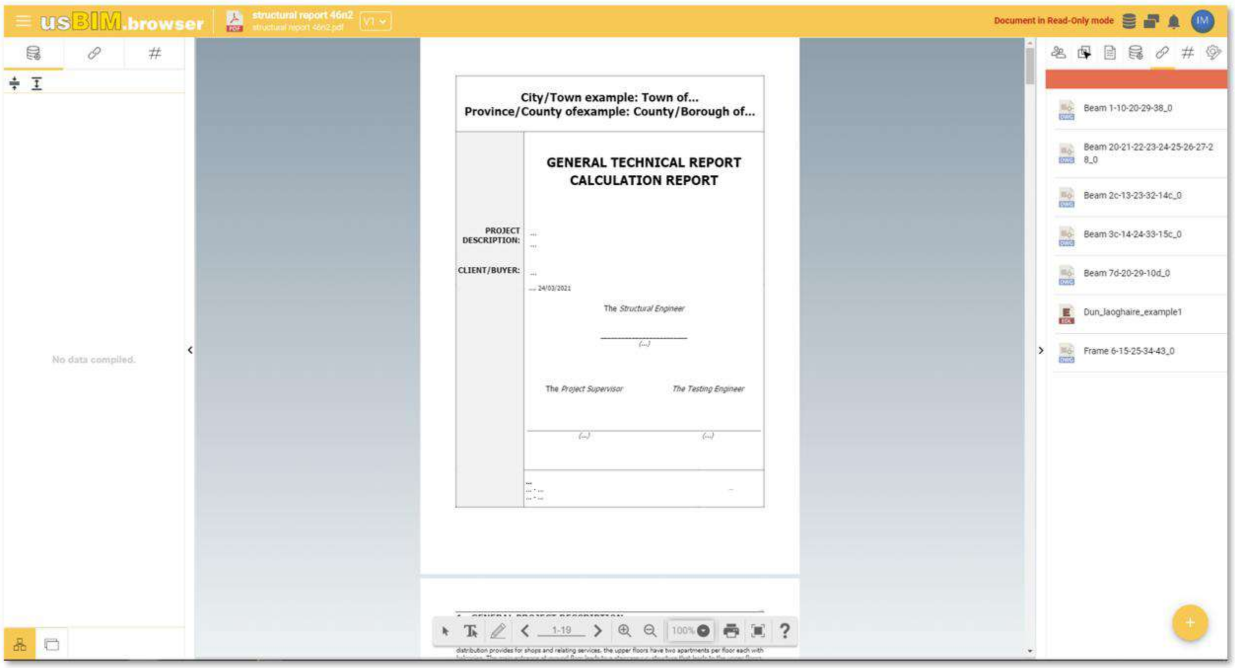

Figure *245. Direct link to a PDF document*

8 usBIM.sync

usBIM.sync is an advanced service offered by **ACCA Software** that allows the user to choose which files to synchronize on their PC by choosing from all the files stored in the **cloud**. Thanks to this feature, users can always have an up-to-date copy of their documents without the need to manually download files. Synchronization is bidirectional and the choice of content to be synchronized takes place both through the **usBIM** platform and through a dedicated application installed locally. This application manages the bidirectional update process, ensuring that any changes made to the cloud or local device are immediately reported and the user can align local content to and from the cloud. This system ensures a smooth and continuous workflow, optimizing collaboration and data sharing within project teams.

8.1 Before starting

Before starting with the synchronization, you need to download the desktop application and install it on your PC. In case the desktop software is already installed on your PC, you will need to start it.

To start the software or download it, you can use the usBIM.sync **command** on the lower right side of the screen (*Arrow 1* Figure *246*).

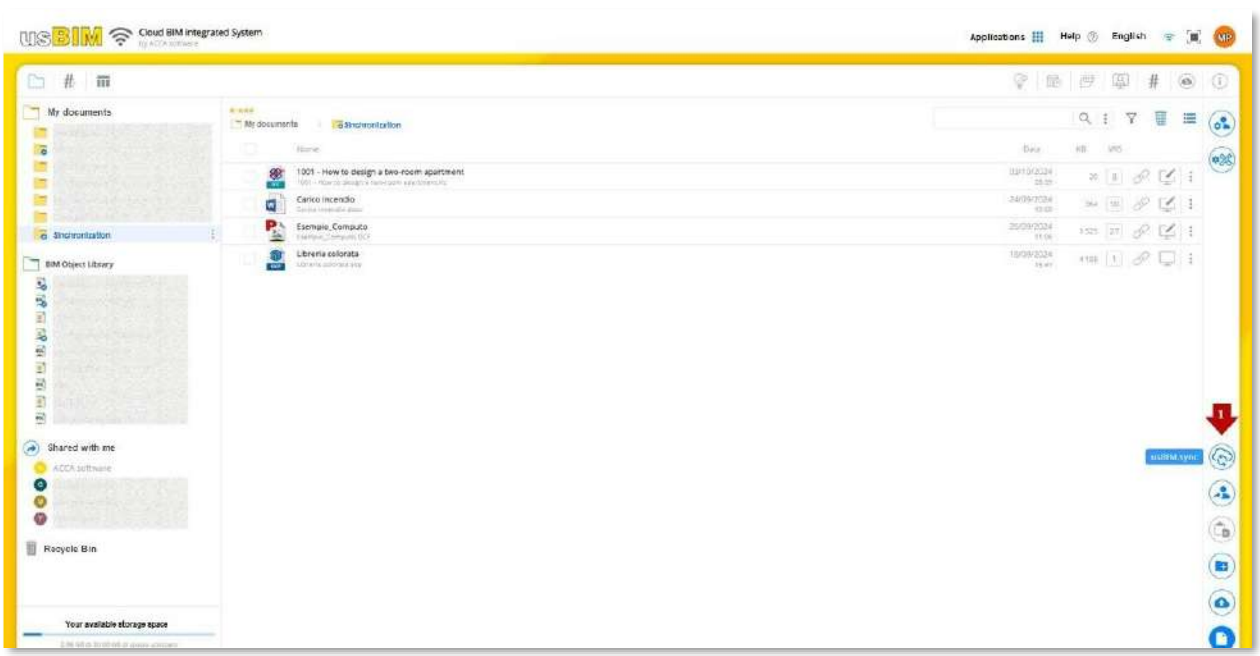

Figure *246. Direct Access to usBIM.sync*

In case the software has not already been installed, a message will appear as per Figure *247*.

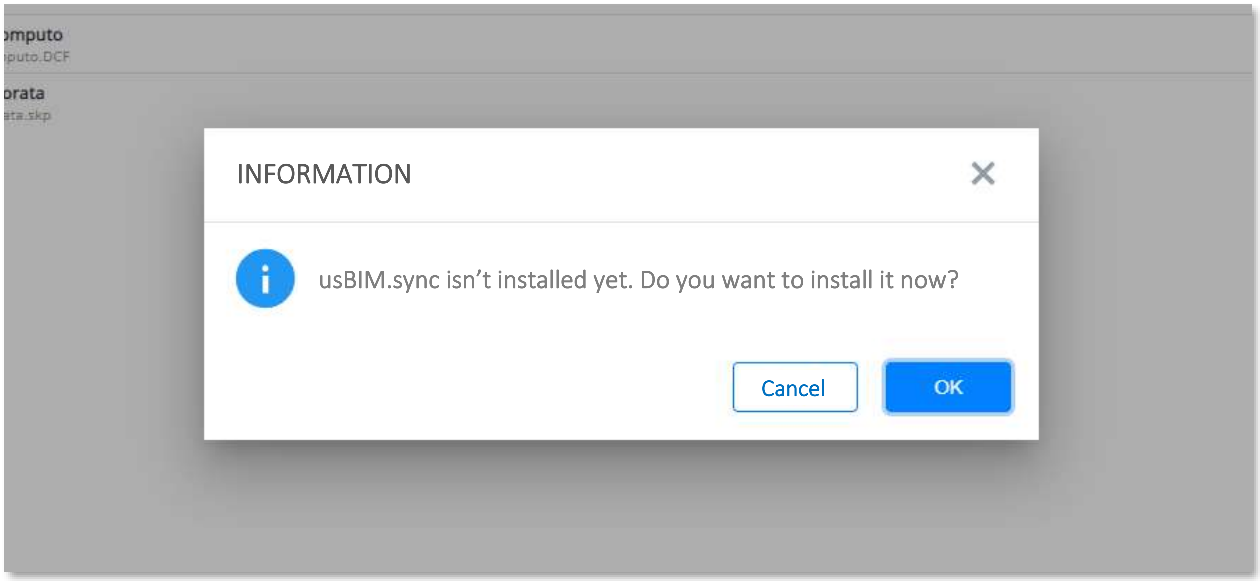

Figure *247. Message alerting you to the possibility to download the software*

Clicking on "OK" will open the page of the ACCA site where you can download the software (Figure 248).

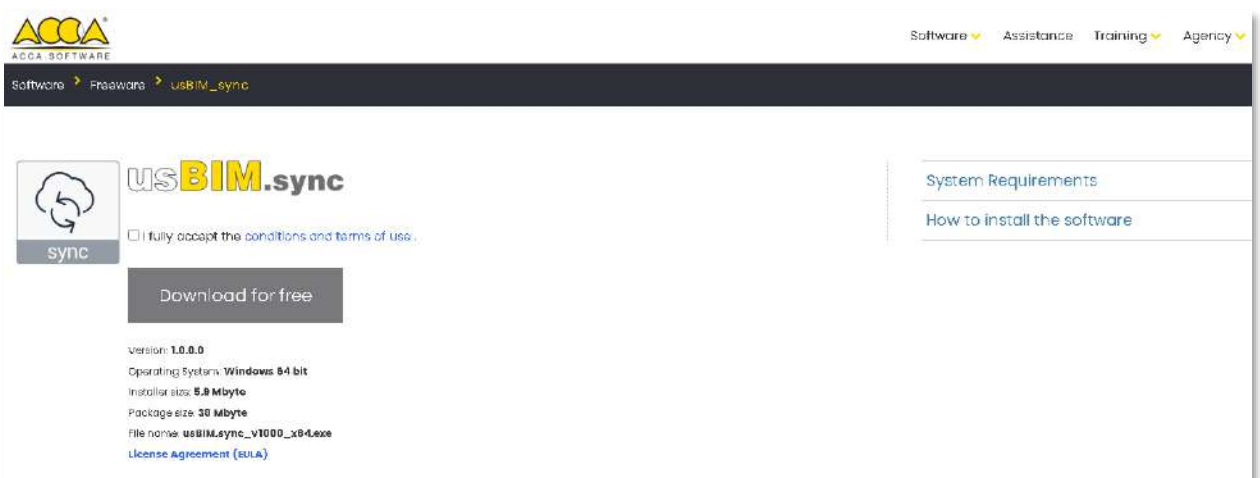

Figure *248. ACCA webpage where you can download usBIM.sync*

As soon as the software is installed and/or started, you can continue with the synchronization.

8.2 Start the Sync process

Synchronization takes place directly on usBIM in two different ways.

8.2.1 Sync to this PC

This mode is used to start the file synchronization already present on usBIM (uploaded directly by a specific user in the past, or maybe shared by a colleague, etc.). Then, to proceed, you need to first select the file of interest and click on the "**Sync to this PC**" command.

This command can be used from two different points:

- in the context menu (Arrow 1 Figure *249*)
- in the information screen on the right (Arrow 2 Figure *249*)

An important thing to specify is that the this previously seen function is the only one that you can use when synchronizing multiple files.

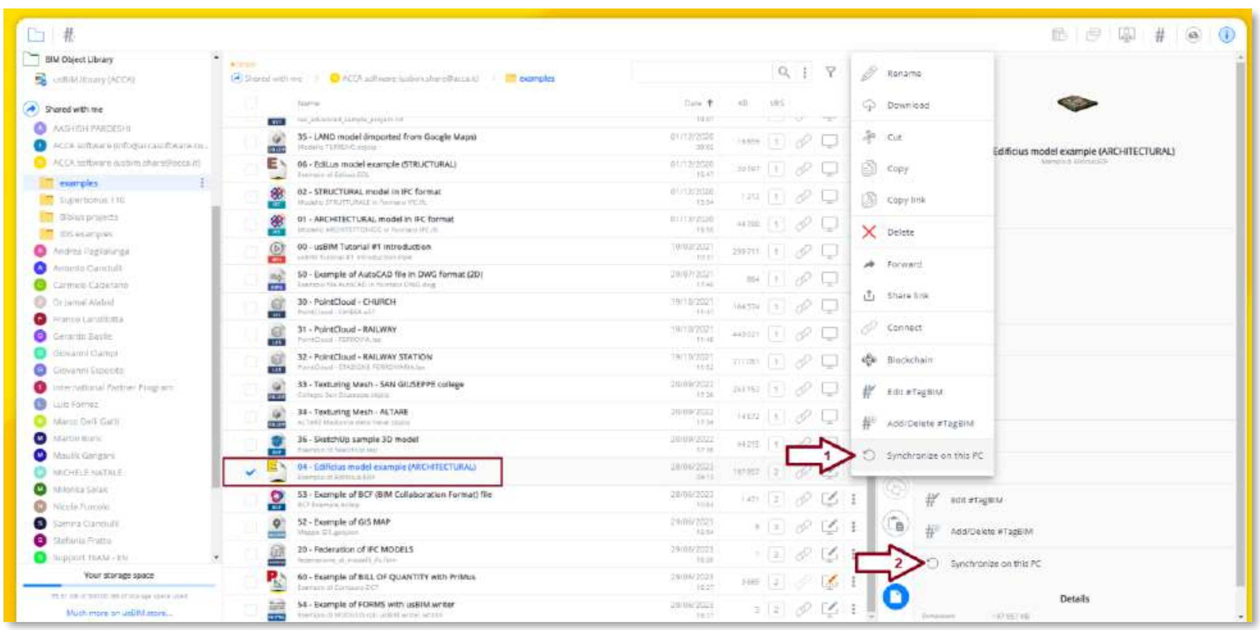

Figure *249. Sync to this PC*

8.2.2 Upload and sync to this PC

This second method is intended to speed up the synchronization of a file that is not yet present in the cloud. In fact, instead of first uploading the file to the cloud from your PC and starting the synchronization later, you can perform the two operations simultaneously.

To proceed with this functionality, you must first click on the "Upload file" command (Arrow 1 Figure *250*) and then choose the "Upload and sync to this PC" item (Arrow 2 Figure *250*)

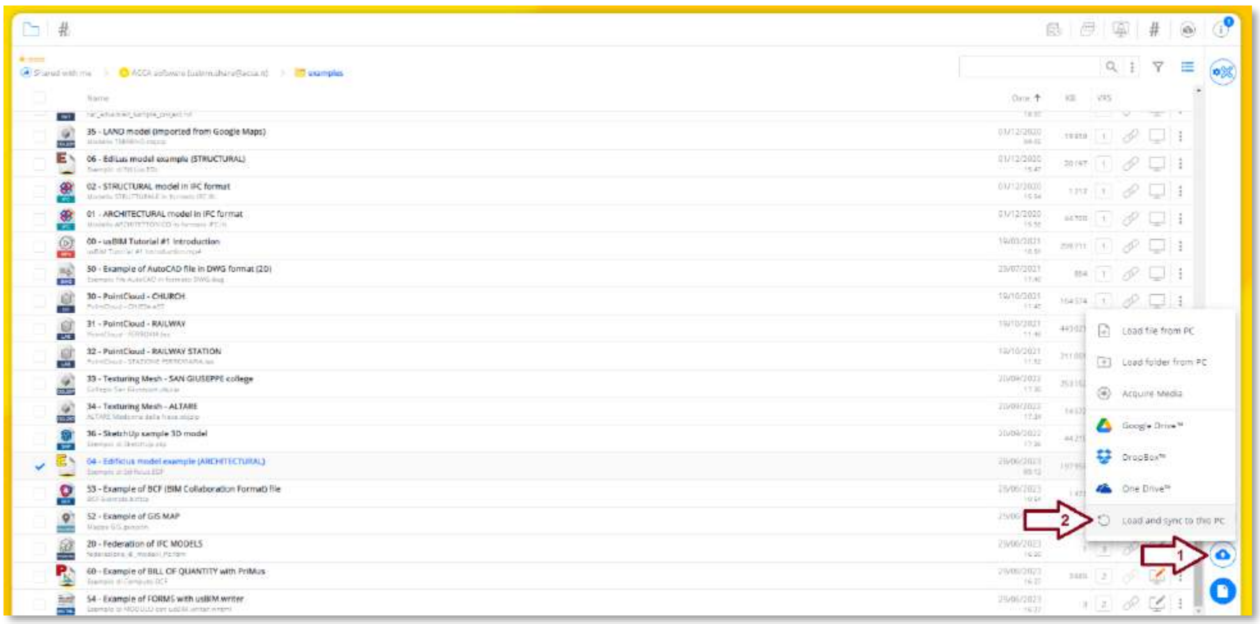

Figure *250. Upload and sync to this PC*

8.3 PC folder selection

Regardless of the procedure adopted at this point, you must declare the folder on your PC where the synchronized files will be placed (Figure *251*). On this screen it is also possible to create a new folder and use it for synchronization (Arrow 1 Figure *251*).

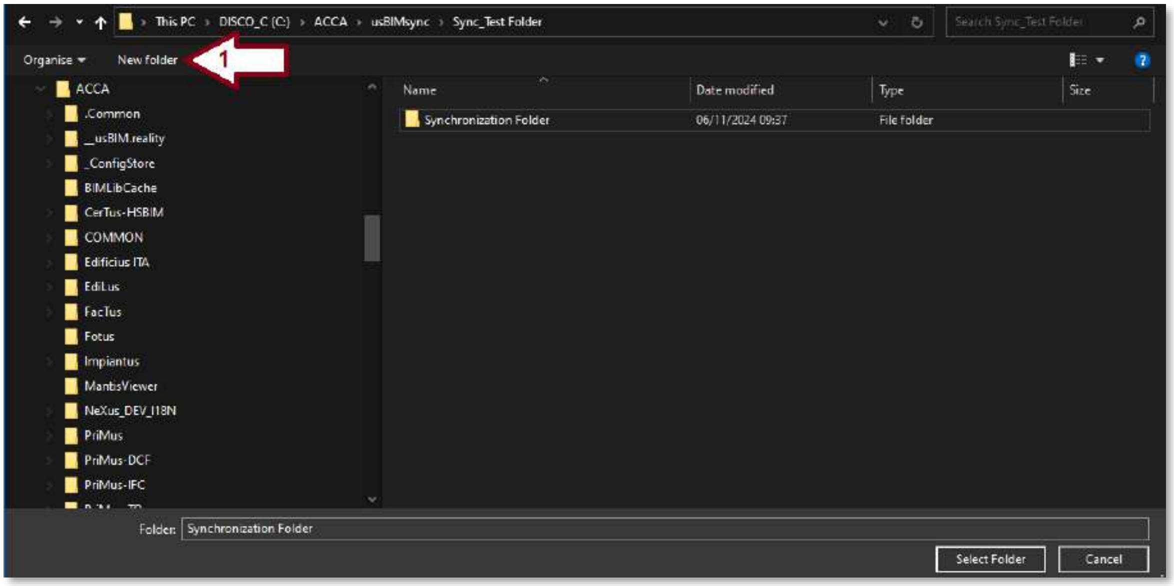

Figure *251. Folder Selection*

At the end of the process, it is possible to verify that the synchronization operation has been successful thanks to the presence of a symbol (a green dot) that appears on the right side of the screen on the same line as the file (Arrow 1 of Figure *252*).

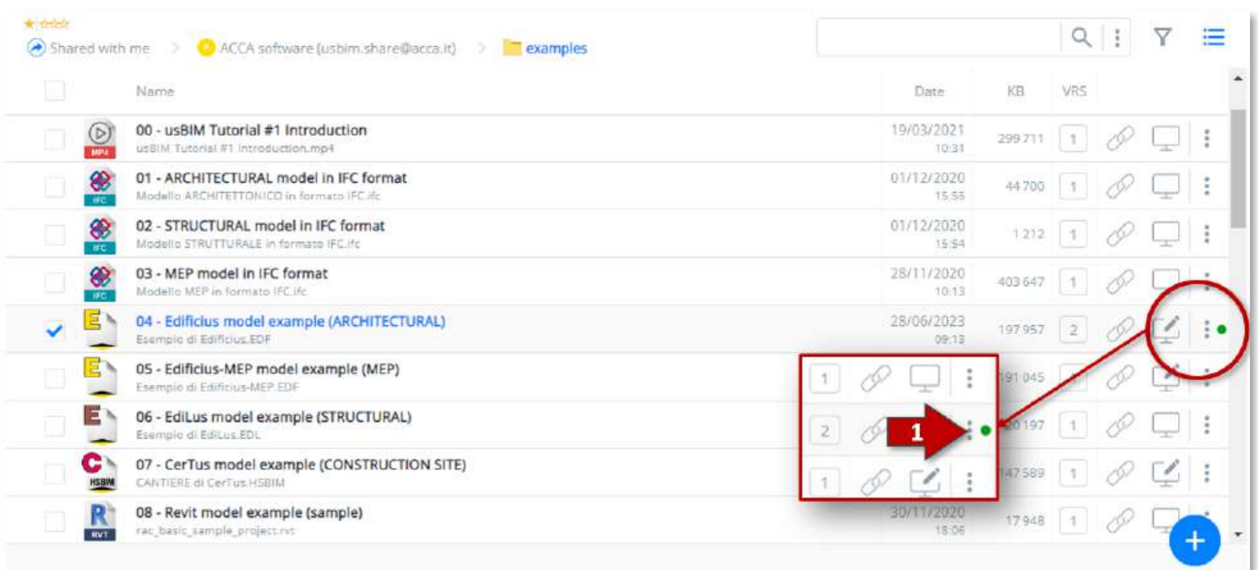

Figure *252. Symbol identifying files that are synchronized*

8.4 Synchronization status legend

In relation to the operations that are carried out and the state of synchronization, different similar ones can be displayed as those listed below.

	Files are synchronized	The active version of the file in usBIM coincides with the file on the PC.
	File in the **most** up-to-date usBIM	The active version in usBIM **is** more up-to-date than the file on the **PC**. In this case, you can continue with the download by clicking directly on the icon. This allows the alignment of the two files and, therefore, the updating of the file on the PC.
	File on the most up-to-date **PC**	The file on the **PC** is more up-to-date than the active version in **usBIM**. In this case, you can continue with the download by clicking directly on the icon. This allows the alignment of the two files and the creation of a new version.
	New version of the file both in **usBIM** and on the **PC**	The file has a new version **both in usBIM and on the PC**. In this case, the PC version will be uploaded and, consequently, in usBIM you will have a new active version.
	Cloud file is in draft	The modification of the file in the cloud is active and, therefore, it is "in draft". In this case it is not possible to download or upload a new version of this file.
	File no longer present	The synchronized file has been deleted, renamed or moved to another folder in usBIM and/or on the PC. This only allows the deactivation of the synchronization with the consequent deletion from the list of the usBIM.sync desktop software

8.5 Cloud Sync

When a file has undergone changes and has an icon as per the previous table, you can start certain operations directly from usBIM.

1. when the symbols as in Arrow 2, 3 and 4 and 6 are present Figure *255*, it is possible to perform the operations by clicking directly on the icons;
2. in the event that the file in usBIM is in the draft state (Arrow 1 Figure *255*) or is synchronized correctly (Arrow 2 Figure *255*), no synchronization actions are foreseen.

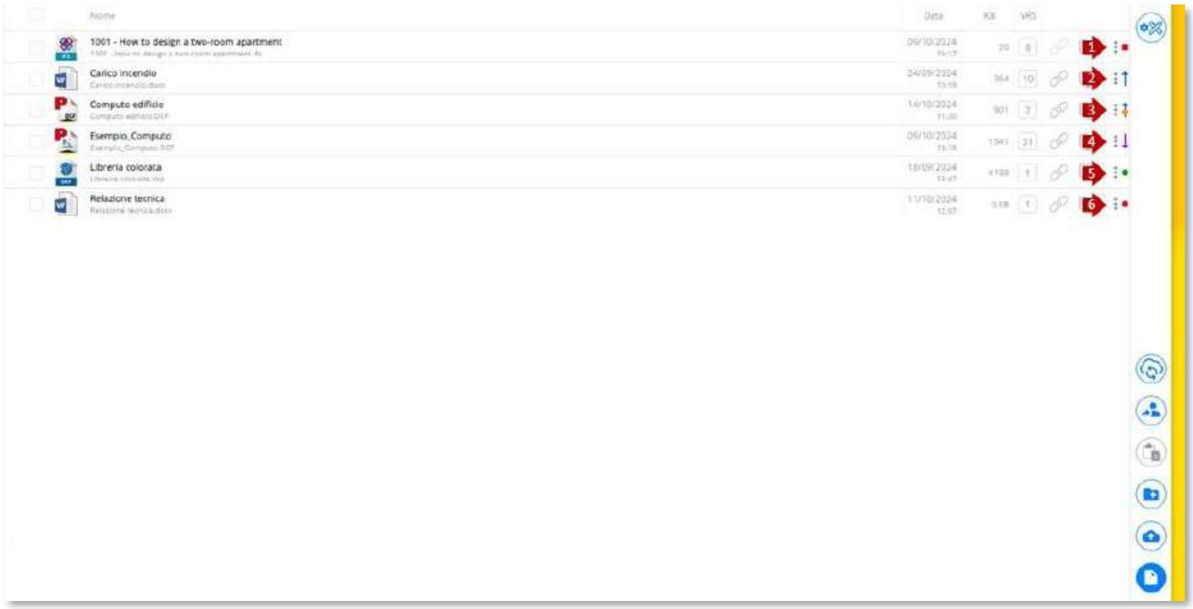

Figure *253. Synchronization icons displayed in the cloud*

8.6 Disable Syncing

Similarly to what happens for synchronization, in case you want to disable synchronization, you need to first select the file of interest and then click on the "Disable synchronization" command.

The command can be displayed:

- in the context menu (Arrow 1 Figure *254*)
- in the information screen on the right (Arrow 2 Figure *254*)

It is necessary to specify that also in this case it is possible to operate simultaneously on several files by deactivating the synchronization after making a multiple selection.

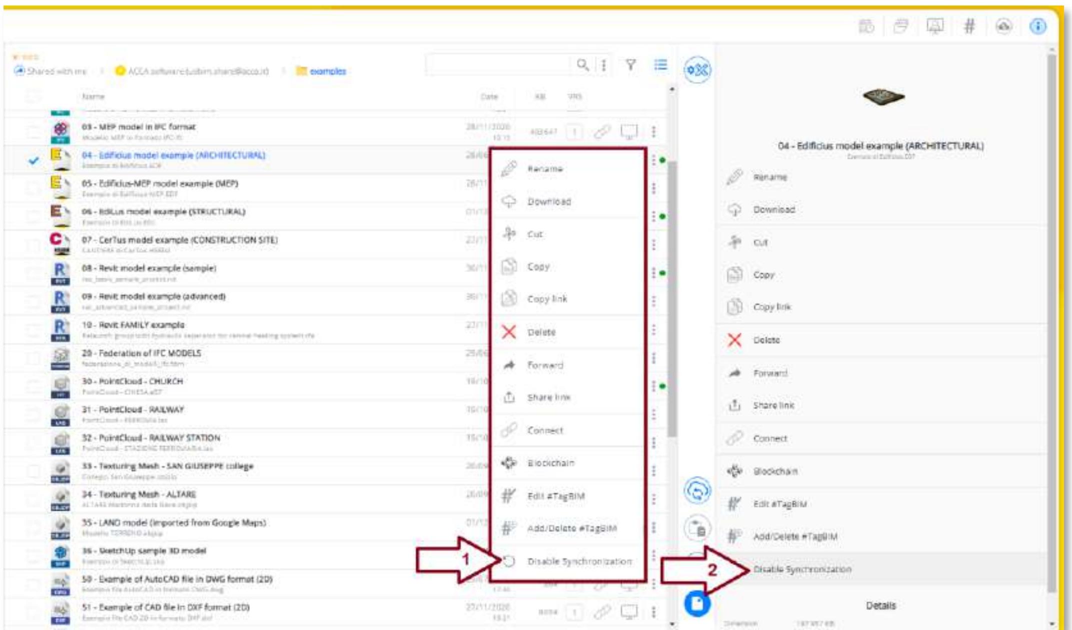

Figure *254. Disable Syncing*

8.7 usBIM.sync desktop application

The usBIM.sync desktop application can be defined as a control window that makes it possible to view the change of the different synchronization states. In addition to this you can also start the synchronization of one or more files at the same time, in a similar way as described above.

8.7.1 File Synchronization Status Update

When a file has an update, the icons indicated in paragraph "*Synchronization status legend*" are displayed. Similarly to what happens in usBIM, in the desktop software, different operations can be carried out, or not, as follows:

- when the symbols as in Arrow 2, 3, 4 and 6 are present Figure *255*, it is possible to perform the operations directly on the software, by clicking on the icons that appear on the right side of the window (at the file of interest). As for the symbols at Arrow 2 and 4, multiple synchronization can be carried out. In fact, you can select the files to be synchronized and then click on the "Sync" command (Arrow 7 Figure *255*);
- in the event that the file in usBIM is in the draft state (Arrow 1 Figure *255*) or is synchronized correctly (Arrow 2 Figure *255*), no synchronization actions are foreseen.

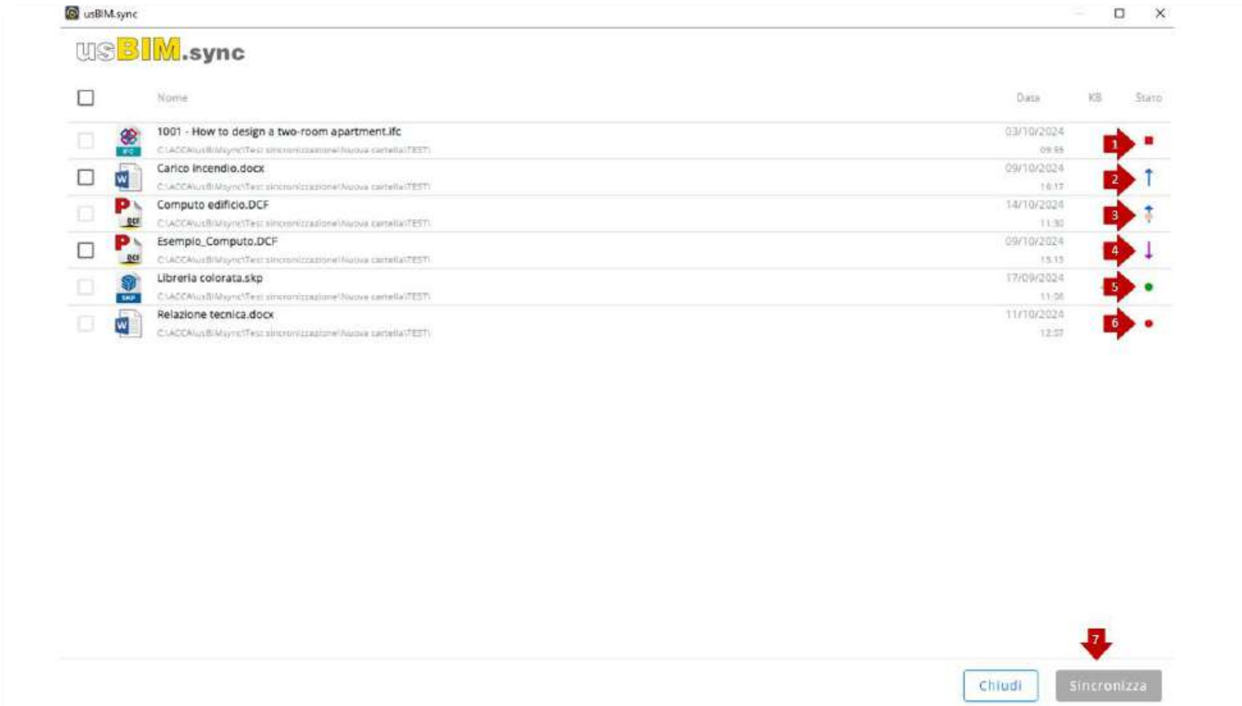

Figure *255. UsBIM.sync Desktop Application Window*

9 Glossary

CDE	→	Common Data Environment
CDE	→	Common Data Environment
AEC	→	Architecture, Engineering, Construction
EFSS	→	Enterprise File Synchronization and Sharing
GUI	→	Graphical User Interface
PA	→	Platform Admin
UI	→	User Interface
WF	→	Workflow
DB	→	Database

10 Appendix A: Supported formats

This section lists all the formats supported by the platform. Please note that the digital collaborative platform, with its integrated services, offers several methods of interaction with the different documents uploaded within it and more specifically:

- Upload and download
- View services with usBIM.browser
- Editing with other integrated services:

Please find below 9 tables that show, in an exhaustive way, all the formats supported by the different services:

usBIM.platform - Supported formats and interaction modes		
File format	Description	Interaction
All	-	Upload and Download

usBIM.platform - Supported formats and interaction modes		
File format	Description	Interaction
.IFC	IFC openBIM Format	Visualization
.EDF	Edificius Format	Visualization
.DAE	3D format	Visualization
.OBJ	3D format	Visualization
.3DS	3D format	Visualization
.SKP	3D format	Visualization
.RVT	3D format	Visualization
.RFA	3D format	Visualization
.FBX	3D format	Visualization
.GLTF	3D format	Visualization
.X3D	3D format	Visualization
.STL	3D format	Visualization
.GLB	3D format	Visualization

usBIM.clash - Supported formats and interaction modes	
File format	Description

.IFC	IFC openBIM Format
.EDF	Edificius Format
.DAE	3D format
.OBJ	3D format
.3DS	3D format
.SKP	3D format
.RVT	3D format
.RFA	3D format
.FBX	3D format
.GLTF	3D format
.X3D	3D format
.STL	3D format
.GLB	3D format

usBIM.checker - Supported formats and interaction modes	
File format	Description
.IFC	IFC openBIM Format

usBIM.bcf - Supported formats and interaction modes		
File format	Description	Interaction
Bcf	BIM Collaboration Format (BCF) files	Editing

usBIM.gis - Supported formats and interaction modes		
File format	Description	Interaction
GEOJSON	GIS map in the .geojson format	Editing

usBIM.writer - Supported formats and interaction modes		
File format	Description	Interaction
whtml	HTML-type TEXT document / TEMPLATE	Editing

usBIM.office - Supported formats and interaction modes		
File format	Description	Interaction

CSV	Comma-separated values	Visualization
DOC	Word Document	View
DOCM	Word Document	Visualization
DOCX	Word Document	Editing
DOT	Word Document	Visualization
DOTM	Word Document	Visualization
DOTX	Word Document	Visualization
ODP	OpenDocument Presentation	View
ODS	OpenDocument Spreadsheet	Visualization
ODT	OpenDocument Text	Visualization
ONE	OneNote Document	Visualization
ONETOC2	Microsoft OneNote Table of Contents File	Visualization
POT	Power Point template	Visualization
POTM	PowerPoint Open XML Macro-Enabled Presentation Template	Visualization
POTX	PowerPoint Template	Visualization
PPS	PowerPoint Document	Visualization
PPSM	PowerPoint Document	Visualization
PPSX	PowerPoint Document	Visualization
PPT	PowerPoint Document	View
PPTM	PowerPoint Document	Visualization
PPTX	PowerPoint Document	Editing
RTF	Rich Text Format	View
VSD	Visio Drawing File	Visualization
VSDM	Visio Macro-Enabled Drawing	Visualization
VSDX	Visio Drawing File	Visualization
XLS	Excel Document	Visualization
XLSB	Excel Document	Visualization
XLSM	Excel Document	Visualization
XLSX	Excel Document	Editing

usBIM.browser - Supported formats and interaction modes		
File format	Description	Interaction
.IFC	IFC openBIM Format	Visualization
.EDF	Edificius Format	Visualization
.BOL	Edificius Format	View

.EDL	EdiLus Format	View
.HSBIM	CerTus HSBIM	View
.DAE	3D format	Visualization
.OBJ	3D format	Visualization
.3DS	3D format	Visualization
.SKP	3D format	Visualization
.RVT	3D format	View
.RFA	3D format	Visualization
.FBX	3D format	Visualization
.GLTF	3D format	View
.X3D	3D format	Visualization
.STL	3D format	Visualization
.GLB	3D format	View
.BLEND	3D format	View
.DXF	2D format	View
.DWG	2D format	View
.DGN	2D format	View
.SVG	2D format	Visualization
.ICDD	ISO Data Drop	View
.PDF	Document	View
.JPG	Image	Visualization
.JPEG	Image	Visualization
.PNG	Image	View
TIFF	Image	View
TIF	Image	View
.BMP	Image	View

.TGA	Image	Visualization
.GIF	Image	View
.PTS	Point cloud	Visualization
.XYZ	Point cloud	Visualization
.PLY	Point cloud	View
.E57	Point cloud	View
.LAS	Point cloud	Visualization
.LAZ	Point cloud	Visualization
.LAX	Point cloud	Visualization
.XYZCIRN	Point cloud	View
.JPEG360	Picture 360	Visualization
MP4	Multimedia	View
MP4	Multimedia	Visualization
OPUS	Multimedia	View
OGV	Multimedia	View
TRANSACTIONS	Multimedia	Visualization
M4V	Multimedia	View
M4A	Multimedia	View
MP3	Multimedia	Visualization
AAC	Multimedia	View
CAF	Multimedia	Visualization
OGA	Multimedia	Visualization
Waw	Multimedia	View