Building Skills 4.0 through University and Enterprise Collaboration

SHYFTE 4.0

WP2: DEVELOPMENT

D2.6: Learning Center as Innovation Lab

vs:2.0.0

Deliverable Lead and Editor: Joao Sarraipa and André Barradas (UNL)

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This deliverable presents the specifications and how to use the Learning Center Portal.

It presents in detail the user guide for users, teachers and administrators of the platform

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Deliverable Lead	Joao Sarraipa and André Barradas (UNL)
Authors	Andreia Artífice, UNL
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Internal Reviewer 2	Yacine Ouzrout, ULL
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Further Information

http://www.shyfte.eu/

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1. Executive Summary

The objective of this deliverable is to report the portal developed to be the front end of the (Learning Centres of Excellence) LCE. It presents some of its technical specifications and provides a how to use of the different functionalities of the Shyfte LCE.

2. BPMN of Main Learning Centers Engines

Nowadays, software platforms externally might be seen as invisible engines on computer code. However, internally, they might be represented by different engines that serve their purpose toward the main system. Thus, in a broad perspective, the Shyfte Learning Centers of Excellence platform, fitted in a distributed architecture, is supported by the *Shyfte main learning center engine*. That comprises the different engines previously mentioned: maturity engine, training engine, SME engine, quality engine, analytics engine. We will start by describing the services belonging to these engines.

Training services are available for two types of users: HEI trainees and SME trainees. In terms of interface visualization, the former are offered the training domains of Shyfte. The latter are presented with the upskill service and allowed to select a job in one of the Shyfte domains. After selecting the aim of the training, users fill out a questionnaire to acquire a skills and competencies profile. Next, users receive a proposal for customized training. Once training is accomplished, users are invited to fill out quality and questionnaire, which is the base for the CoE Quality Evaluation.

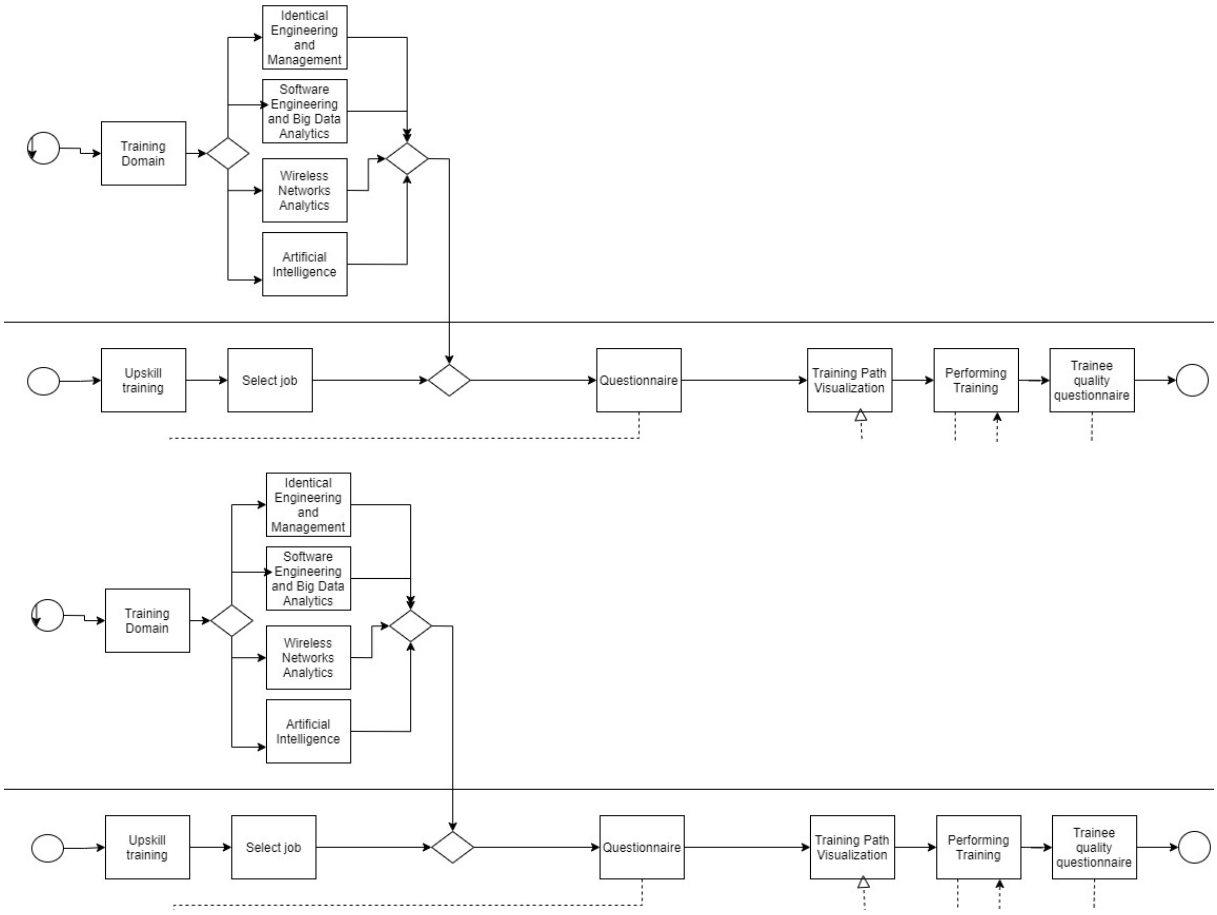

Figure 1 – Training services for HEI trainees and SME trainees.

The Quality Assessment Dashboard is a service presented to the quality Manager, for the visualization of the quality of the learning center of excellence. The dashboard has information for all the main domains of the CEO, for trainees, training, and trainers.

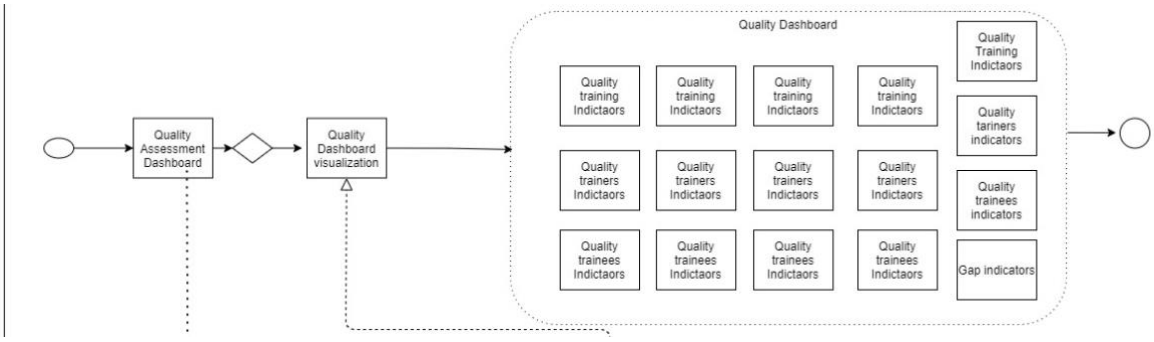

Figure 2 – Quality Assessment Dashboard.

Previously described services, see Deliverable D2.5, are computed in one or more engines. Those engines have been named according to their functional computational purposes. Among them is the Maturity Engine, which might be seen as the more complex of the engines, with functioning linked to the other engines. That is, other engines are organized to solve the maturity of the system.

The Shyfte IS Model is defined through the aggregation of engines, each fulfilling a specific computational purpose. System engines are web-based engines in the majority in the category of search engines. From a micro-level perspective, a software engineer might be seen as an externally controllable piece of software that integrates powerful logic that has been designed to perform a specific part of work. It performs efficiently complex or abstract tasks and it is simple to evoke its functionality.

The Shyfte platform service is mainly computed by an engine, but it may be supported by another engine. Thus, one can say that those engines might be seen as pieces of software that together serve as the core foundation for the learning platform that integrates the Maturity Model. Next are described services resorting to representation, with more details concerning specific engines usage.

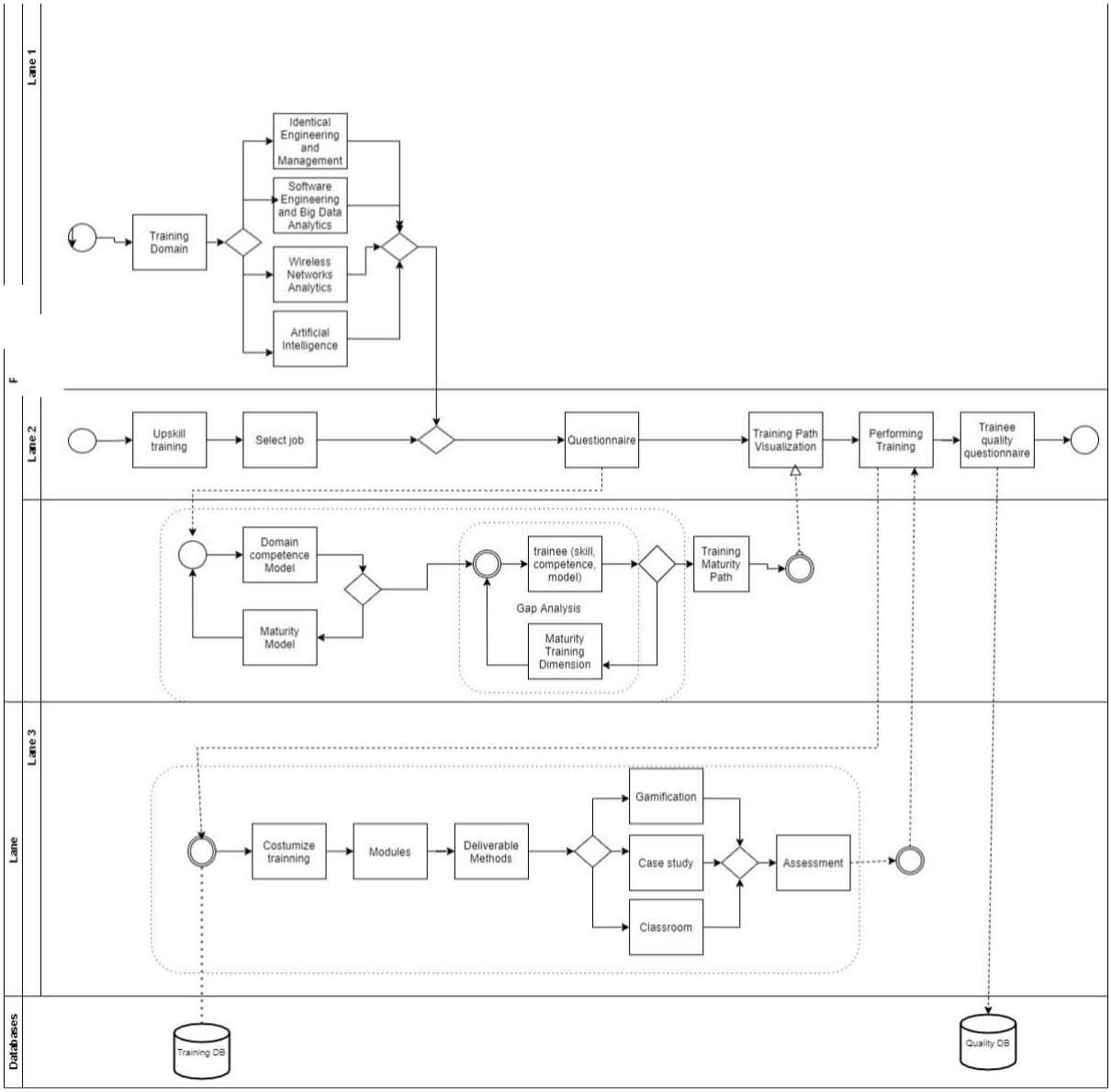

Figure 3 – Training services for HEI trainees and SME trainees with representation of engines.

The Maturity and Training engine are both employed on customized training. Training services are available to two different kinds of users: HEI trainees and SME trainees. The former is offered training options in four Shyfte domains: Industrial engineering and management, software engineering and big data analytics, wireless network analytics, and artificial intelligence. The latter is presented as the upskill service, in which the first step is to select the target job. Once the goal of the training is known, the training service path is the same for both trainees. The next step is to acquire, through a questionnaire, the competencies and skills *trainee maturity profile*, which allows the system to compute the *training roadmap path* and deliver the customized training.

The training roadmap path, i.e. the path of training defined in terms of Industry 4.0 roadmap for a job or Shyfte domain, is computed in the Maturity Engine since it is only possible to compute rather to the specification of the site maturity and quantify the Information System components in its different domains.

Figure 4 shows Shyfte BPMN, representing several services. On the top are the training services, which generate customized training for two types of users: the trainees belonging to the Centre of Excellence/Universities service, and the SME trainees.

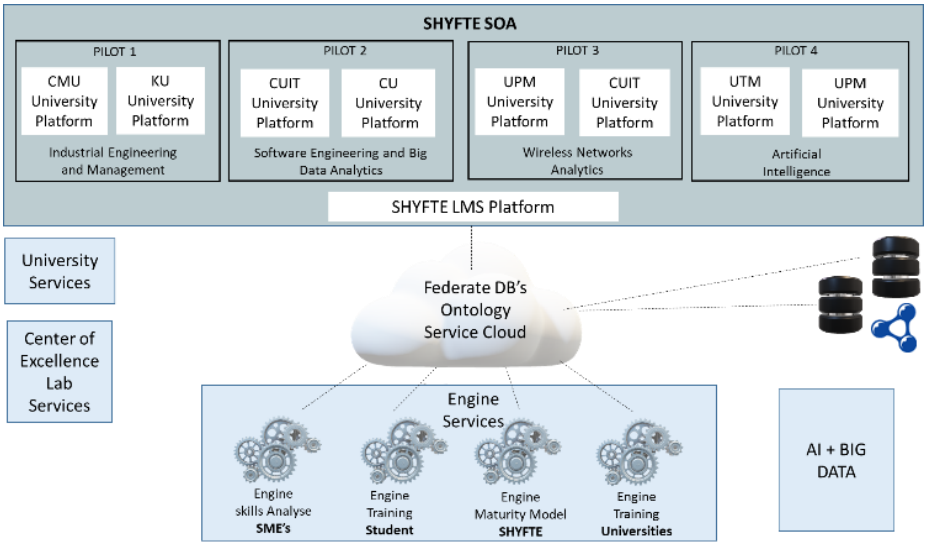

Figure 4 – Federated SOA.

The Quality Assessment Dashboard service is mainly computed by the quality engine. Its main result is computed based on the quality parameters of trainees, training, and gap analysis, and then presented to the quality manager in a Dashboard for visualization.

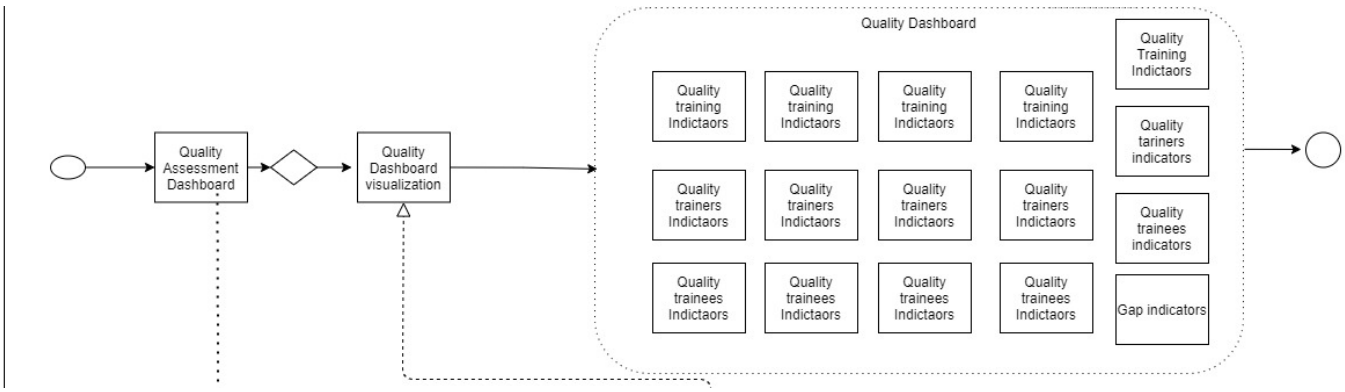

Figure 5 – Training service for a quality manager with a representation of engine usage.

The Centre of Excellence's main service is the upskill service that promotes teaching-learning, offering customized training. It considers the gap analysis according to SMEs information and the trainee or student's level of expertise in a specific domain.

The infrastructure enables call services between heterogeneous services. It includes data transformation, dealing with security and reliability, service management, monitoring, and logging.

Shyfte SOA might be implemented through the use of the main LMS platform represented by the Shyfte Centres of Excellence. Federation is known to allow the integration of different components in a flexible way that allows to integrate or combine existing teaching-learning materials from universities with those developed specifically for the Centres of Excellence. Additionally, it is a step forward to allow the life continuity of the Centres, which may be located in Lisbon and replicable in France, and to ensure the maintenance of the Shyfte platform.

Each Pilot is responsible for the platform at his or her level, maintaining its identity aligned with country regulations country, thanks to the federation quality of the architecture. The databases are distributed at different locations. This means that there are local databases and databases at the top level of the architecture that should be synchronized.

3. Centers of Excellence Platform Structure

The application developed has two main parts, backend and frontend:

- The frontend part involves all the visual aspects of the application and some less computational heavy services, like user management, form data and more.
- The backend part has all the services needed for the application to work as well as the database used in this application. The documentation that contains all the services can be accessed here: https://code.grisenergia.pt/shifte/backend-portal/backend-portal and is shown below.

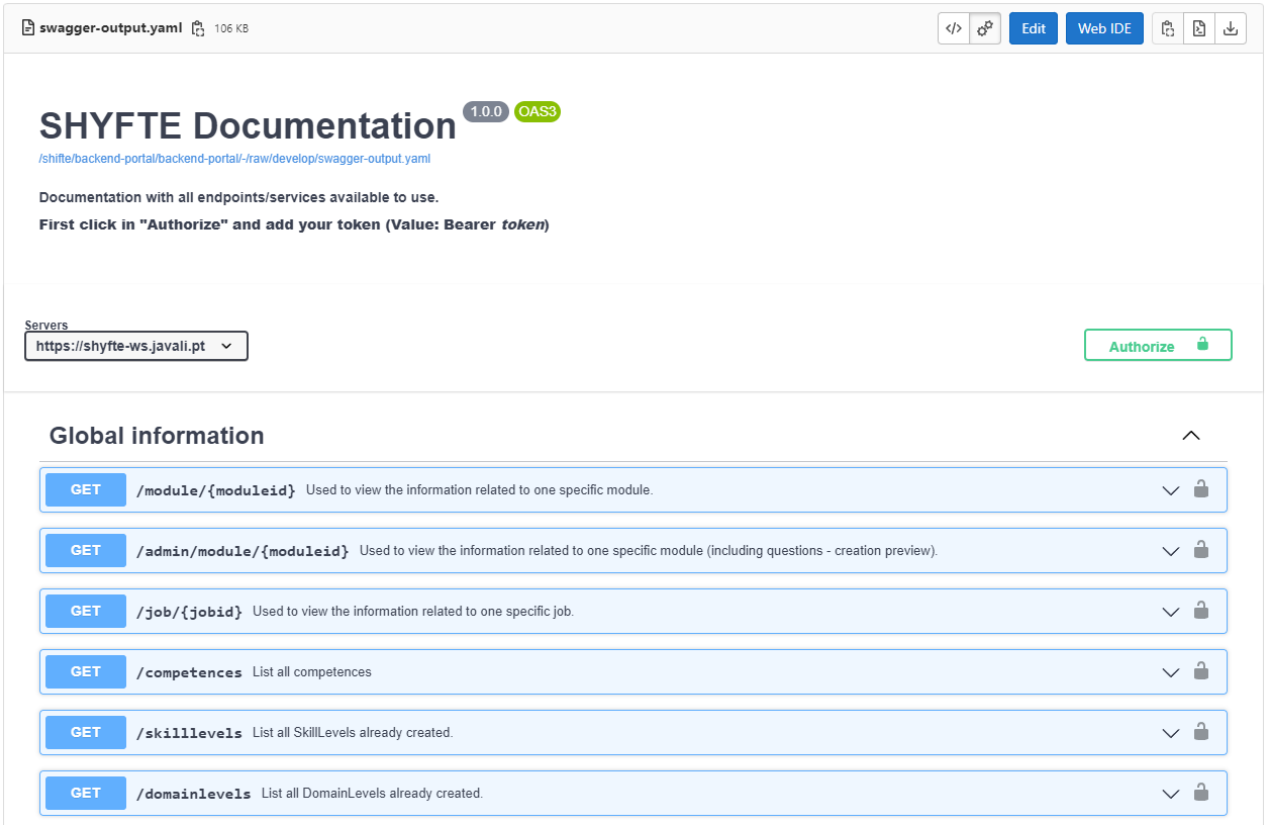

Figure 6 – Shyfte Documentation.

Figure 7 – Shyfte Backoffice

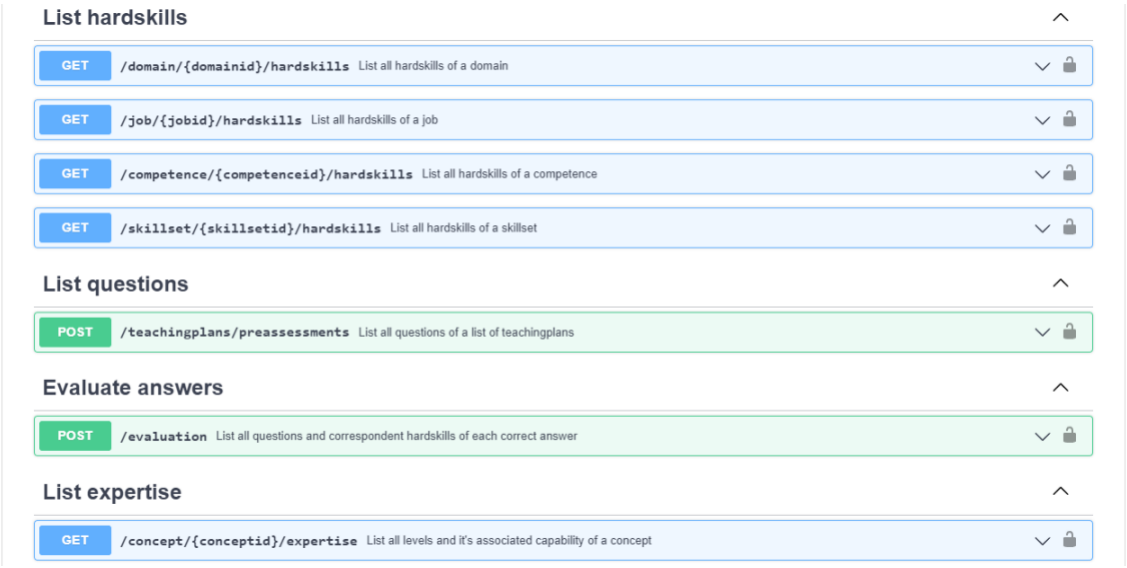

Figure 8 – List hard skills, List questions, and List expertise

Figure 9 – User related, Statistics related

Any of the services presented need to have communication with the database in order to work properly. The database is shown in Figure 10.

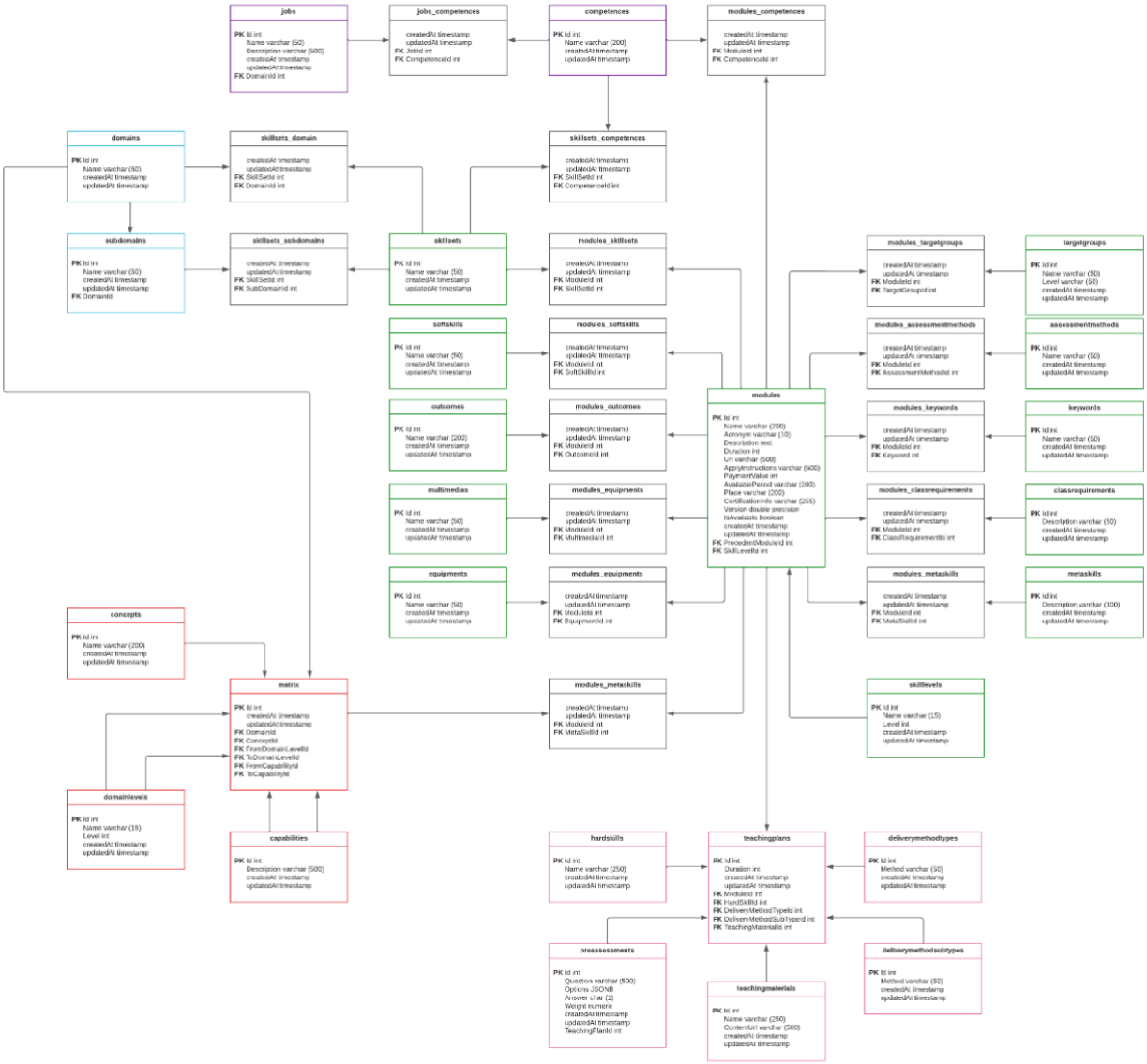

Figure 10 – Shyfte Learning Center Database

The modules are the central piece of the database having the most connections between tables. A module consists in the aggregation of several other tables that complete its information. Each module also has a group of topics that consist in a group of hard skills with relevant information about it. Finally, they also have a level that helps organizing them.

A module is contained in other tables that allow to get them, such as skill sets, competences and concepts. A group of competences is a job, and a group of concepts is a matrix.

The table that aggregates it all is the table domains and is where a lot of the search begins.

In this more simplified image is the other important part of the database which are the training programs. These are owned by the users and represent a group of modules needed to achieve a goal in relation to the other and more complex part of the database (see Figure 11).

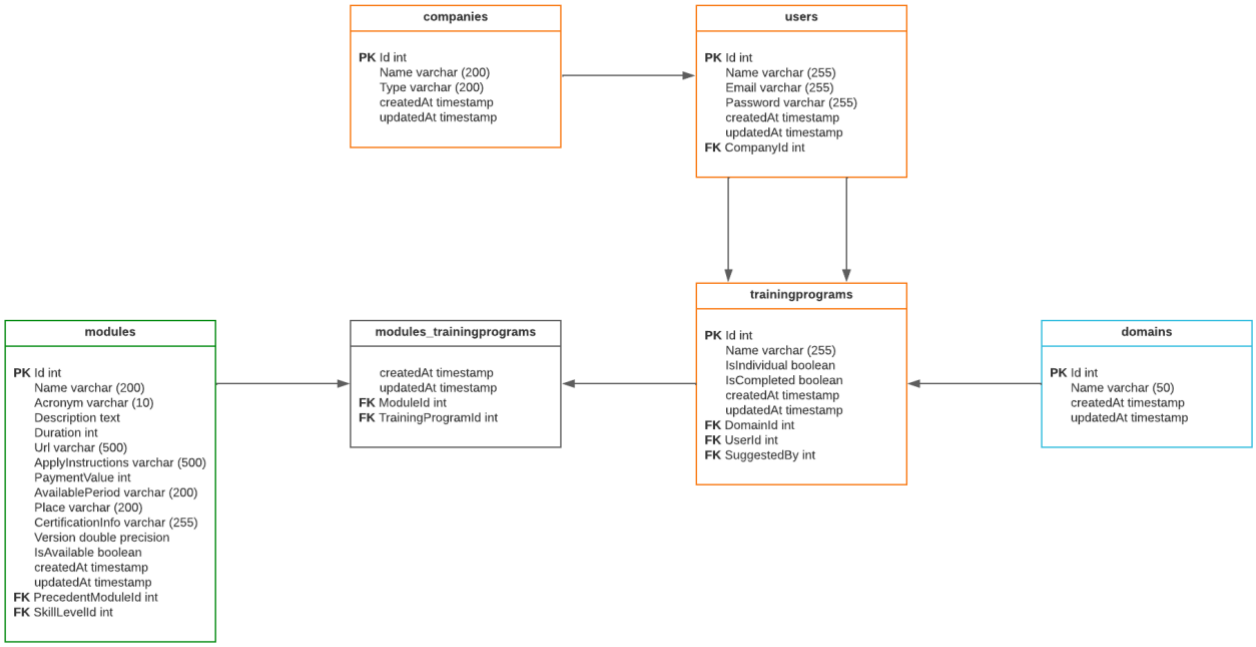

Figure 11 – Other important part of the database

4. LCE Portal Main Flows – User Guideline

4.1. User Login/Register

When a user goes to the main page (https://shyfte.dev9.javali.pt/) there will be a possibility to login in its account.

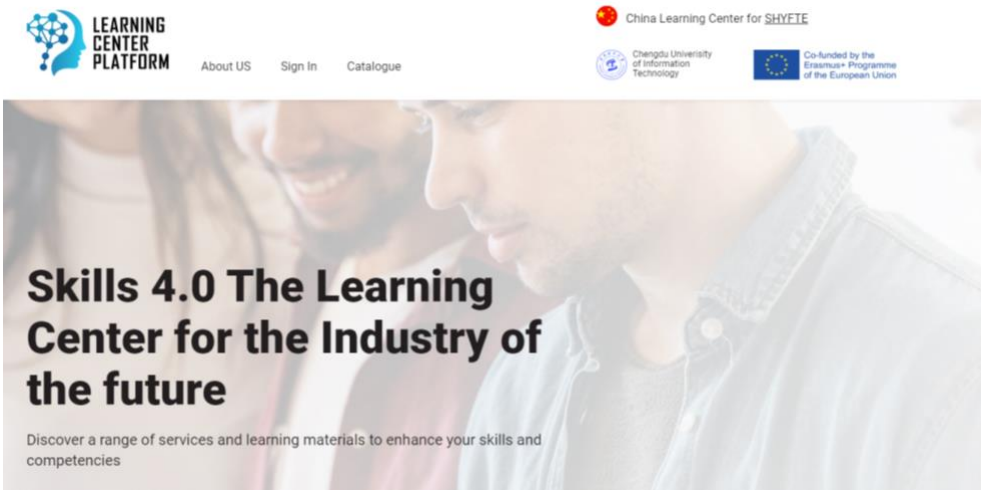

Figure 12 – Main page.

The users can login or register as an individual (with an optional organization) or as an organization to create a new one (https://shyfte.dev9.javali.pt/user/login).

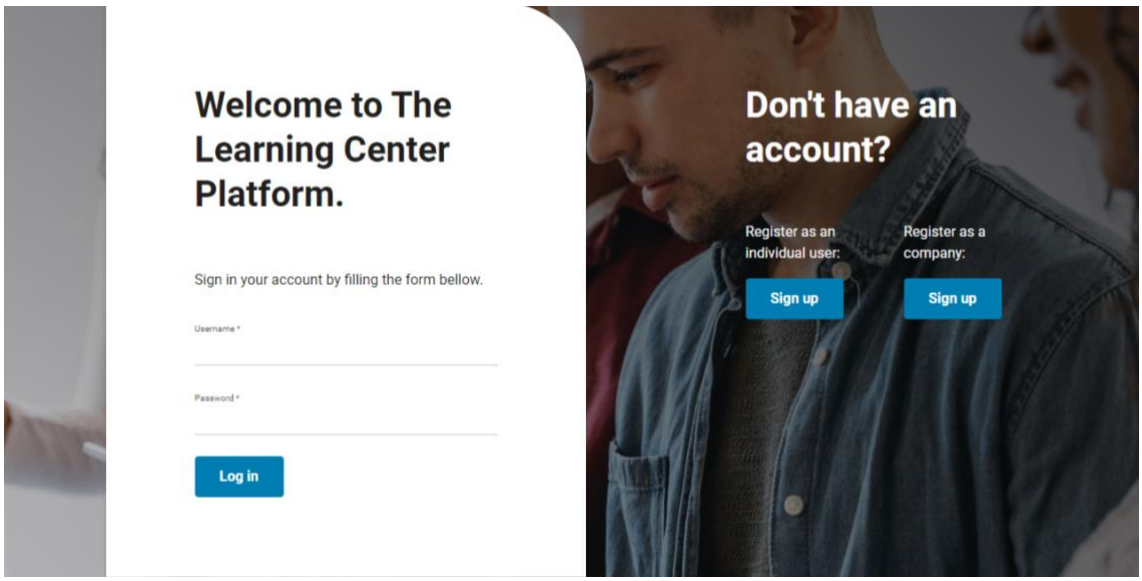

Figure 13 – Related page for log in or register.

Going back to the main page there are two possibilities for creating training programs, as student or enterprise. If the users did not login yet, these options will ask to login first.

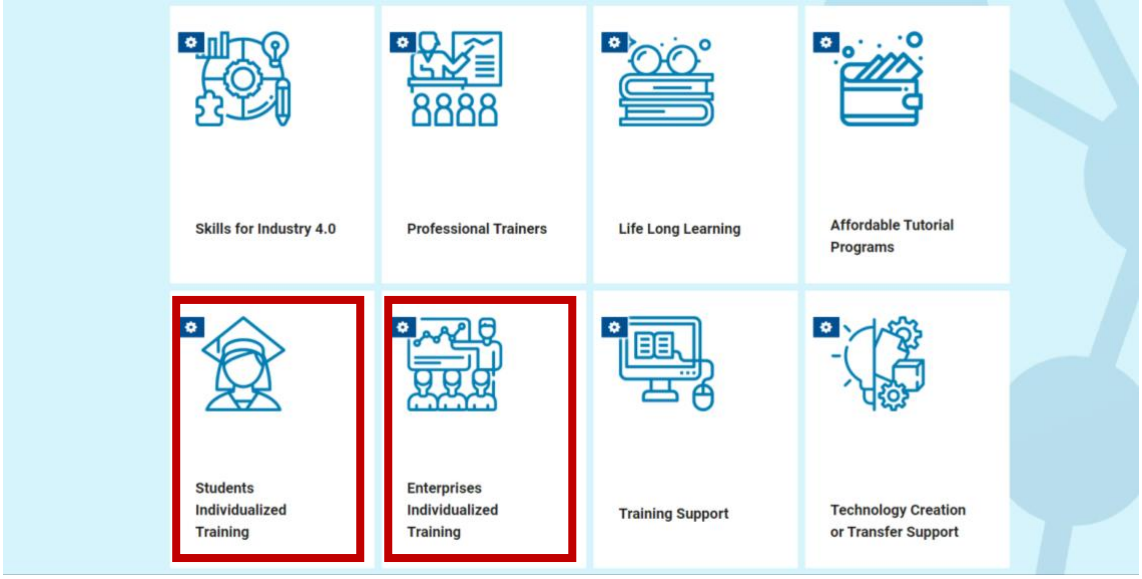

Figure 14 – Related page for students or enterprises individualized training.

4.2. Students Individualized Training

The first option (Students Individualized Training) will let the users create a training program for themselves depending on what the users want to upskill. The first step is to choose a domain.

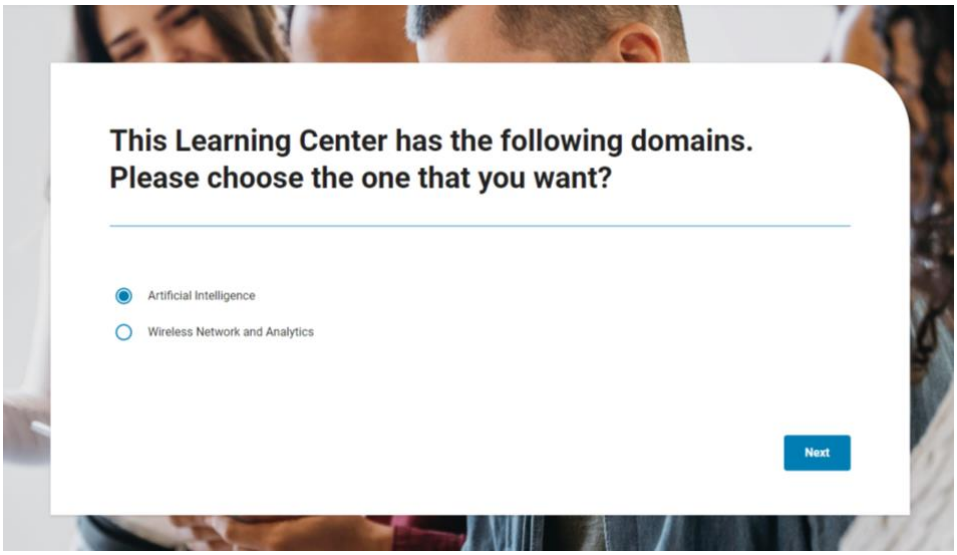

Figure 15 – Choosing a domain.

After choosing a domain the users have to choose their goal and there are four options, re-skill or up-skill a job position, up-skill a particular skill set or up-skill a particular competence.

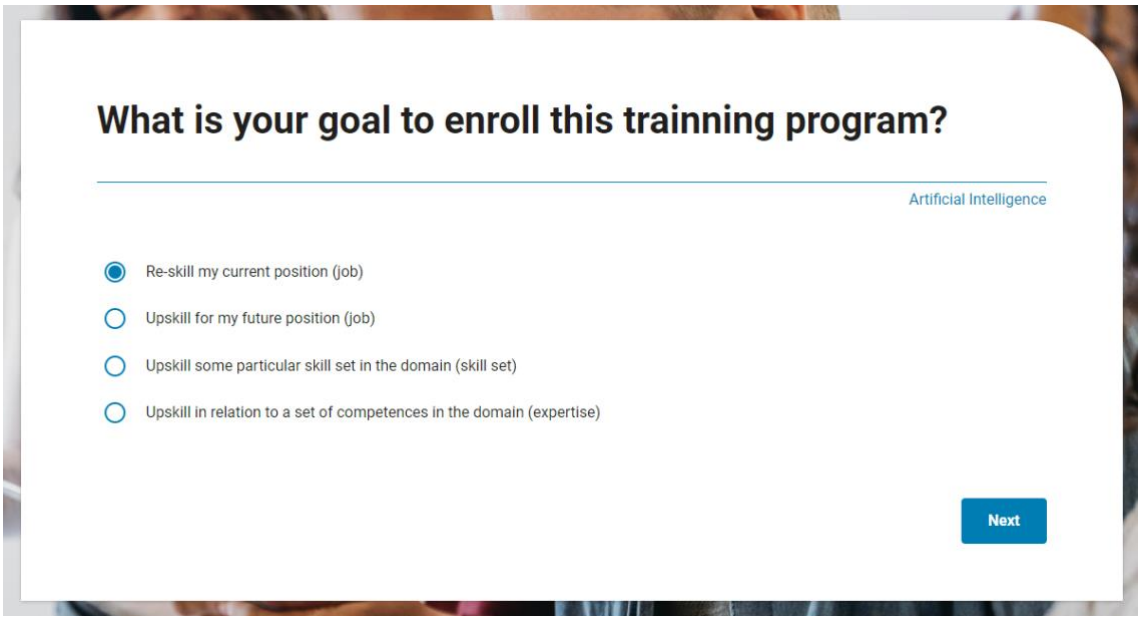

Figure 16 – Choosing a goal.

Each option will give the users a list of different possibilities to choose from and those are respectively shown in the next three images (the first two will show the same jobs).

Figure 17 – Choosing a job.

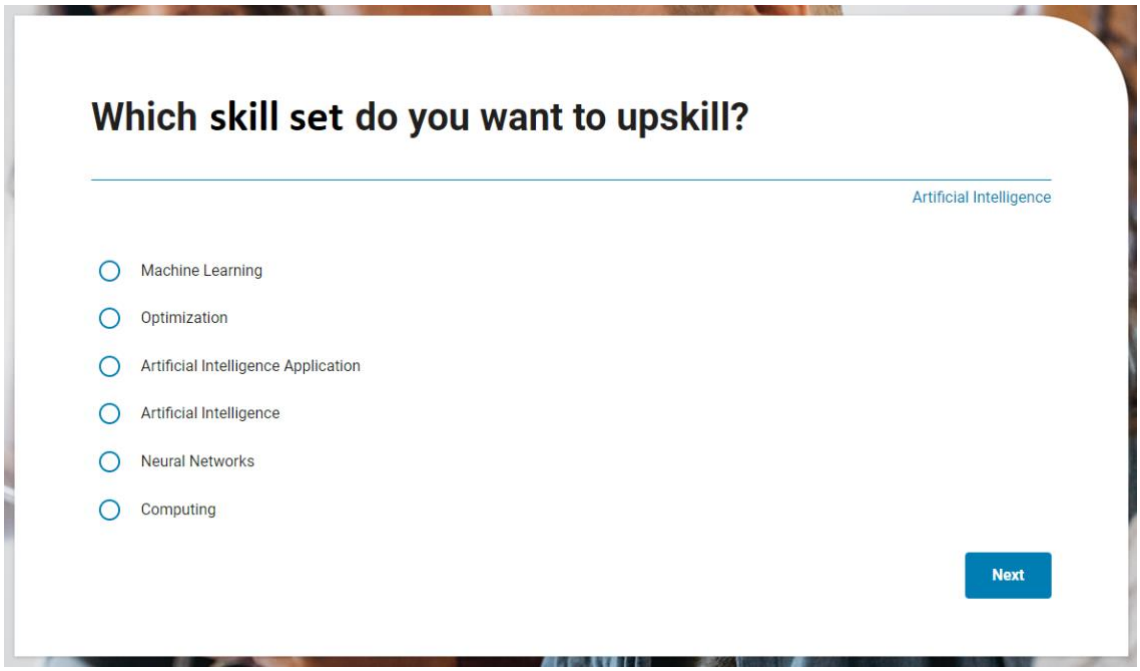

Figure 18 – Choosing a skill set.

After selecting the skill set to be improved, the users can select the specific skills they want to be trained in.

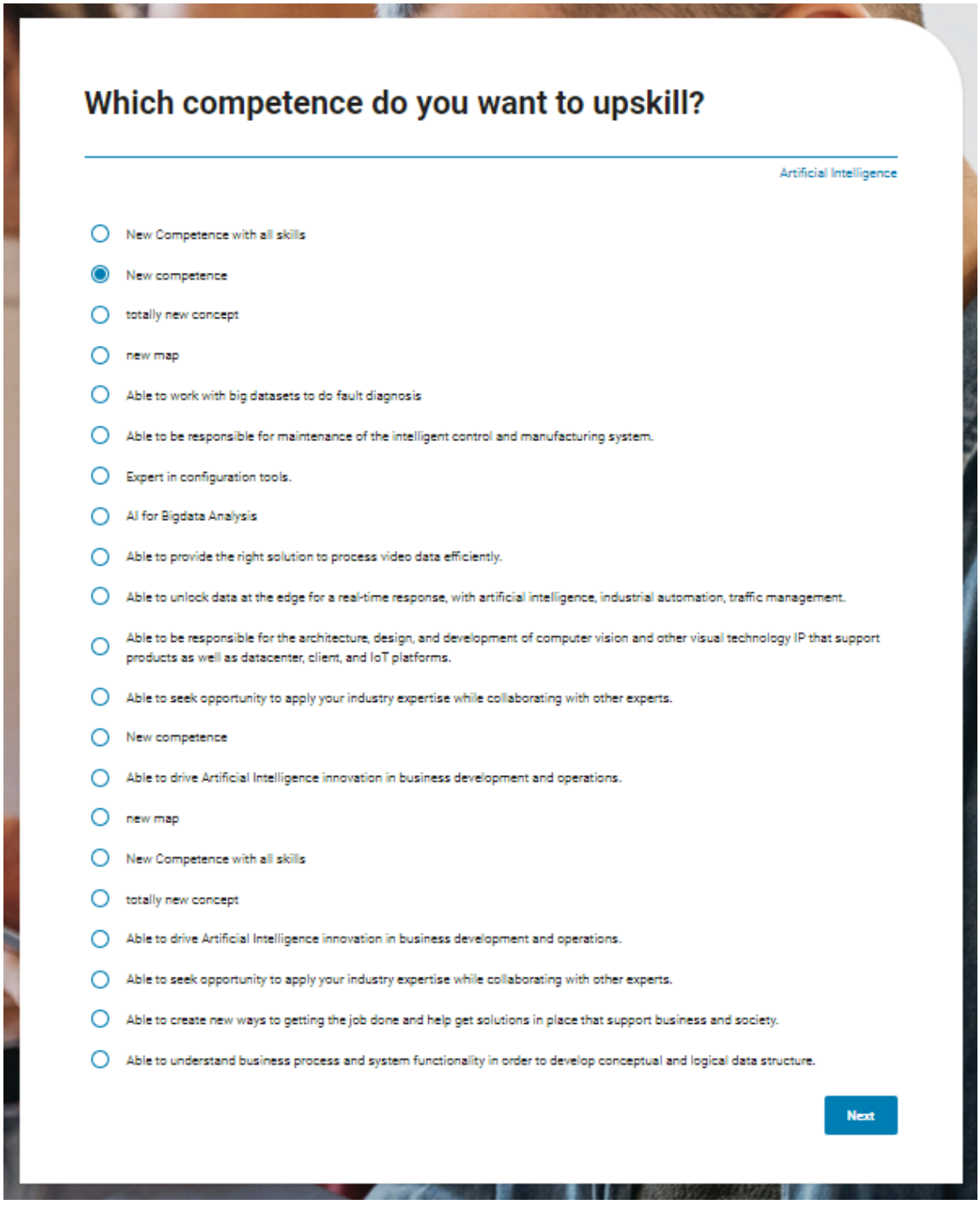

Figure 19 – Choosing a competence to be upskilled.

The website will then present a list of hard skills organized by level (Beginner, Intermediate, or Expert) and the users may choose which ones they already know. It is not required to check any skill if a user don't know any of them.

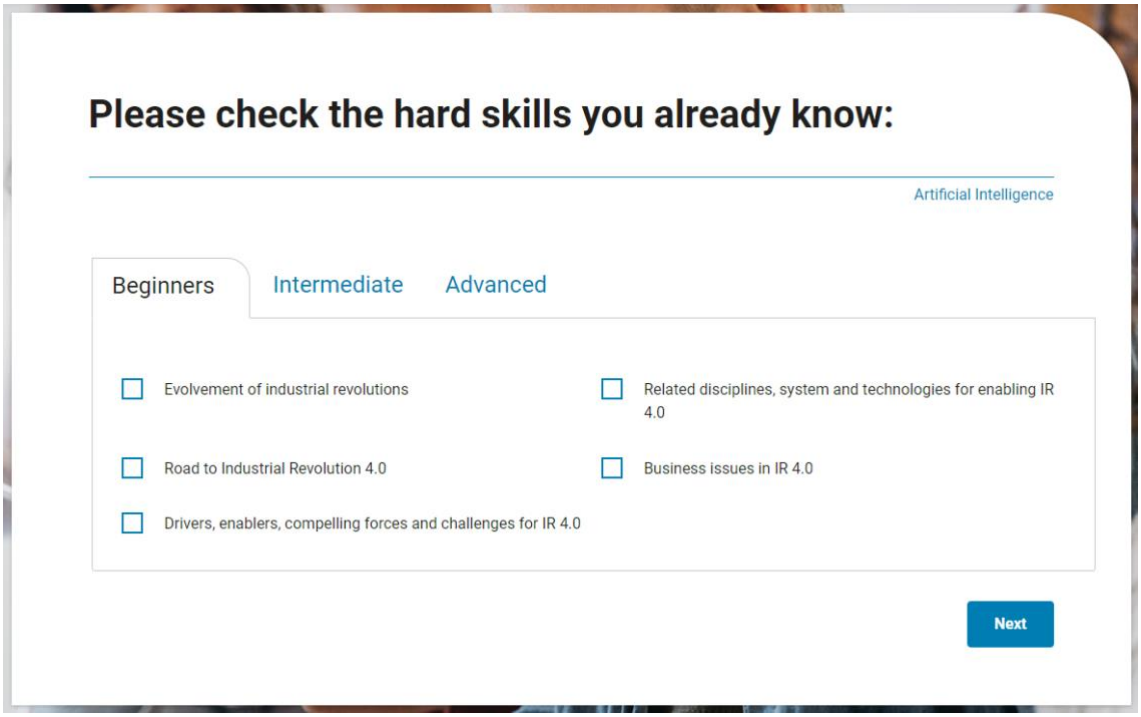

Figure 20 – Checking the hard skills (beginner level).

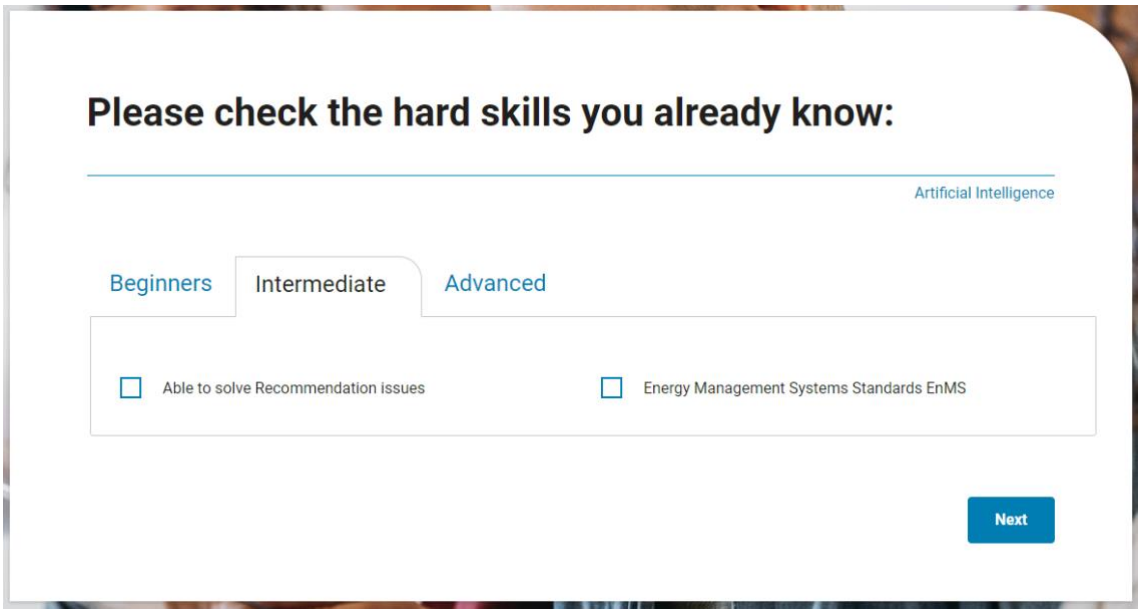

Figure 21 – Checking the hard skills (intermediate level).

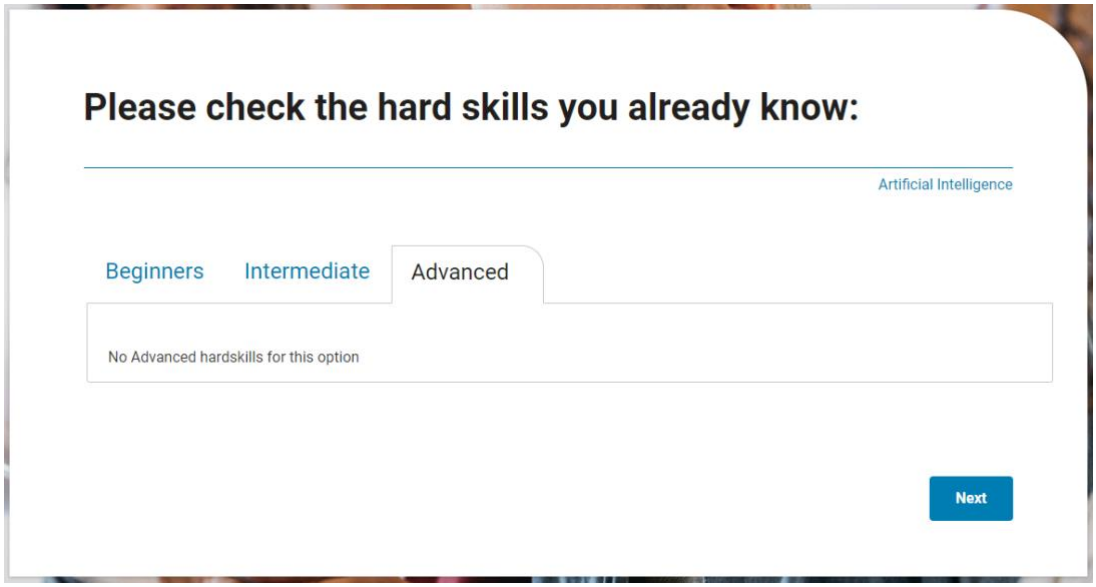

Figure 22 – Checking the hard skills (advanced level).

Now the users must prove that they know the hard skills selected and for that the website will present a quiz with questions regarding those hard skills. If a user didn't know any of the presented skills this part will be skipped.

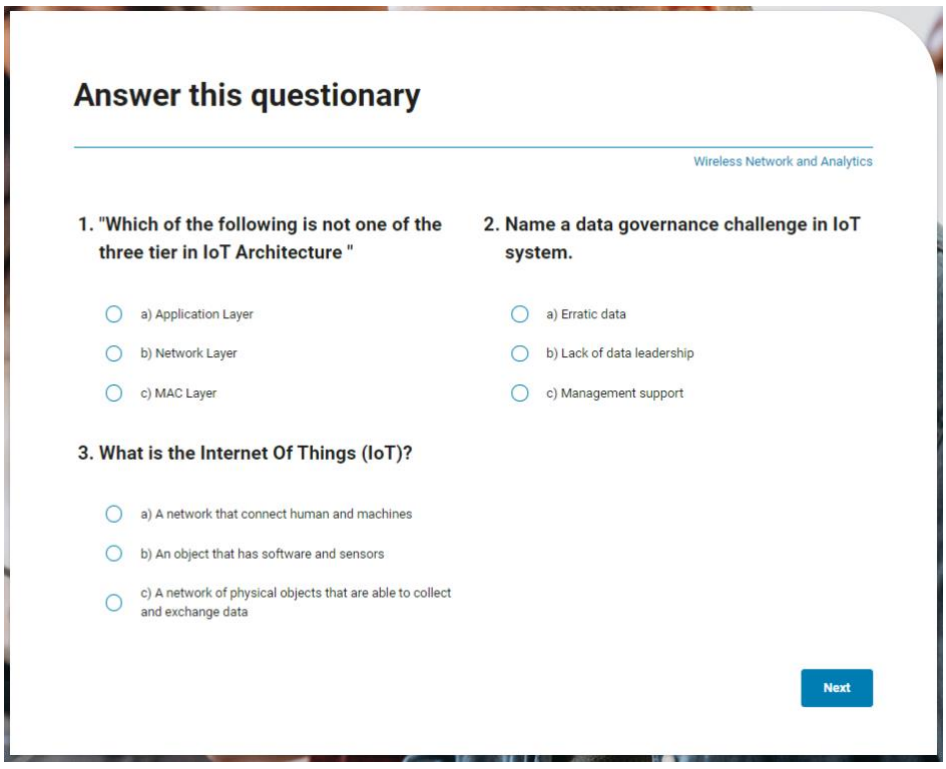

Figure 23 – Questionnaire related to the chosen hard skills.

If a user answers the questions correctly the corresponding hard skill that originated the question will be erased from the list of hard skills that the user must know to complete the training program.

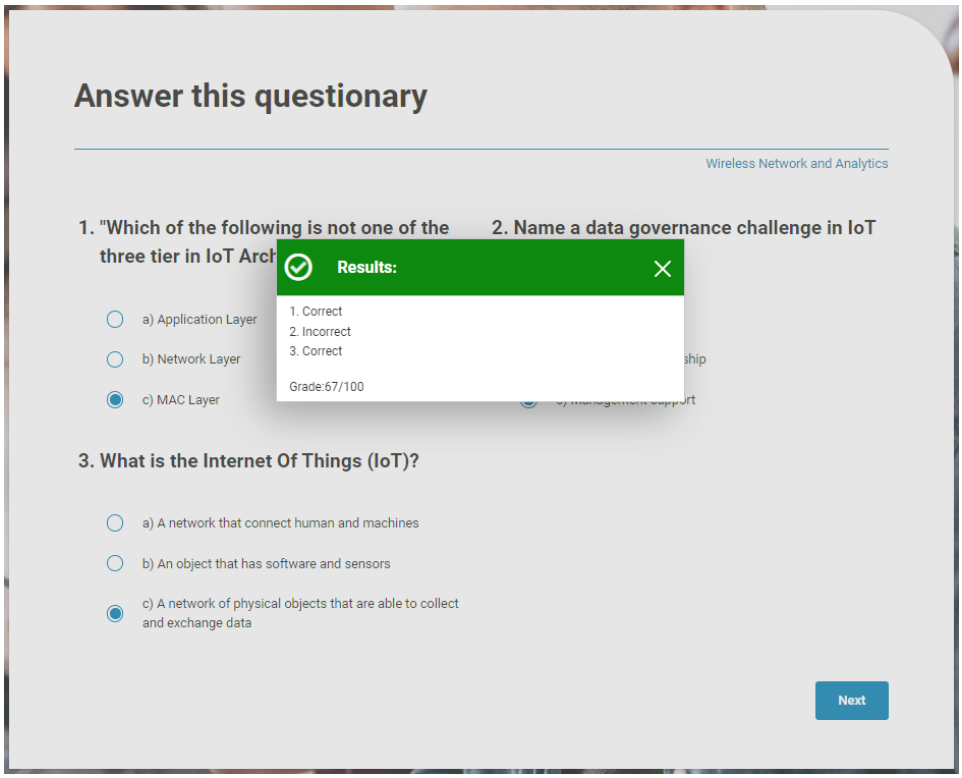

Figure 24 – Showing the results of answered questionnaire.

The initial list is then updated and presented to the user again.

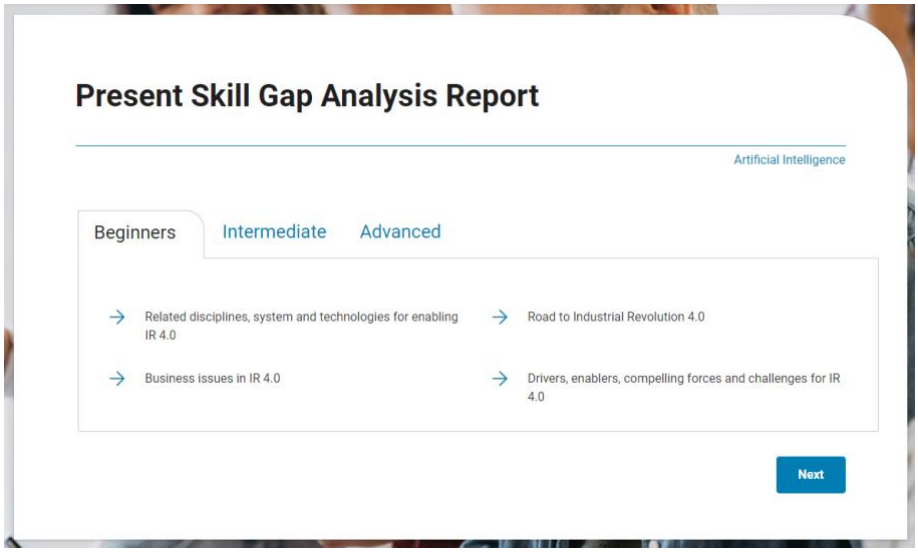

Figure 25 – Updating and presenting the initial list (beginner level).

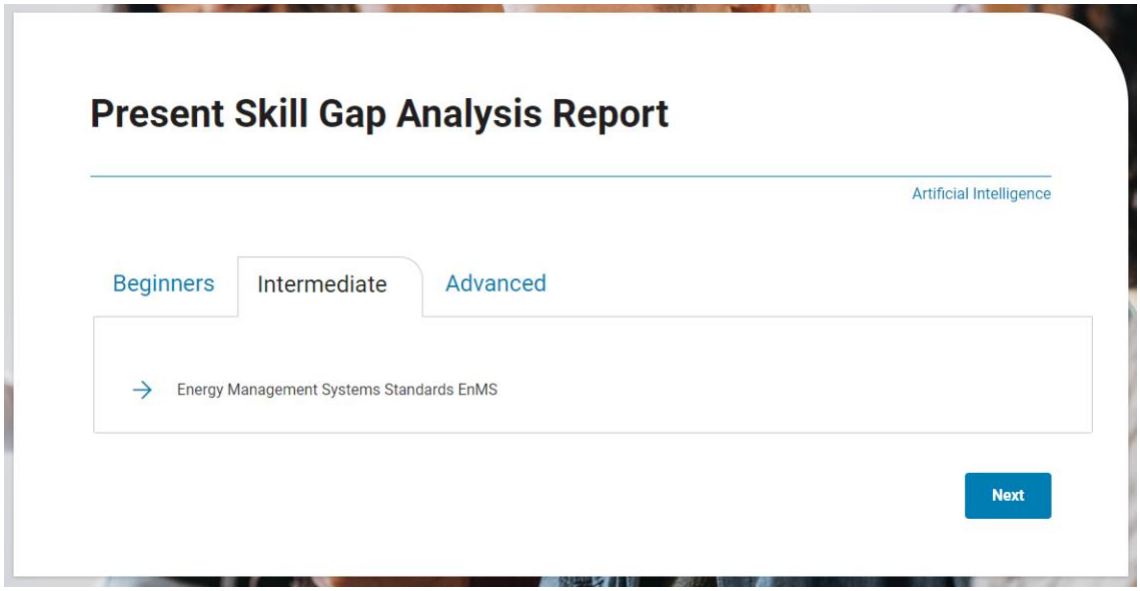

Figure 27 – Updating and presenting the initial list (intermediate level).

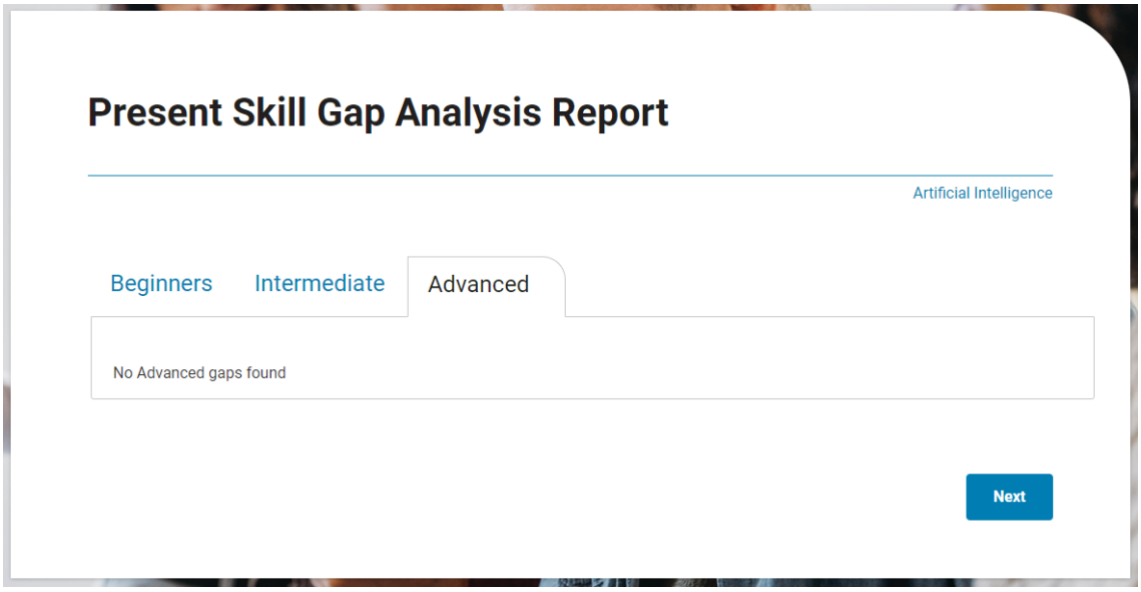

Figure 28 – Updating and presenting the initial list (advanced level).

This way the website creates the skill gap needed and generates a training program proposal. Now the user can subscribe or cancel the plan. If the users want to subscribe, they must fill the training program name input.

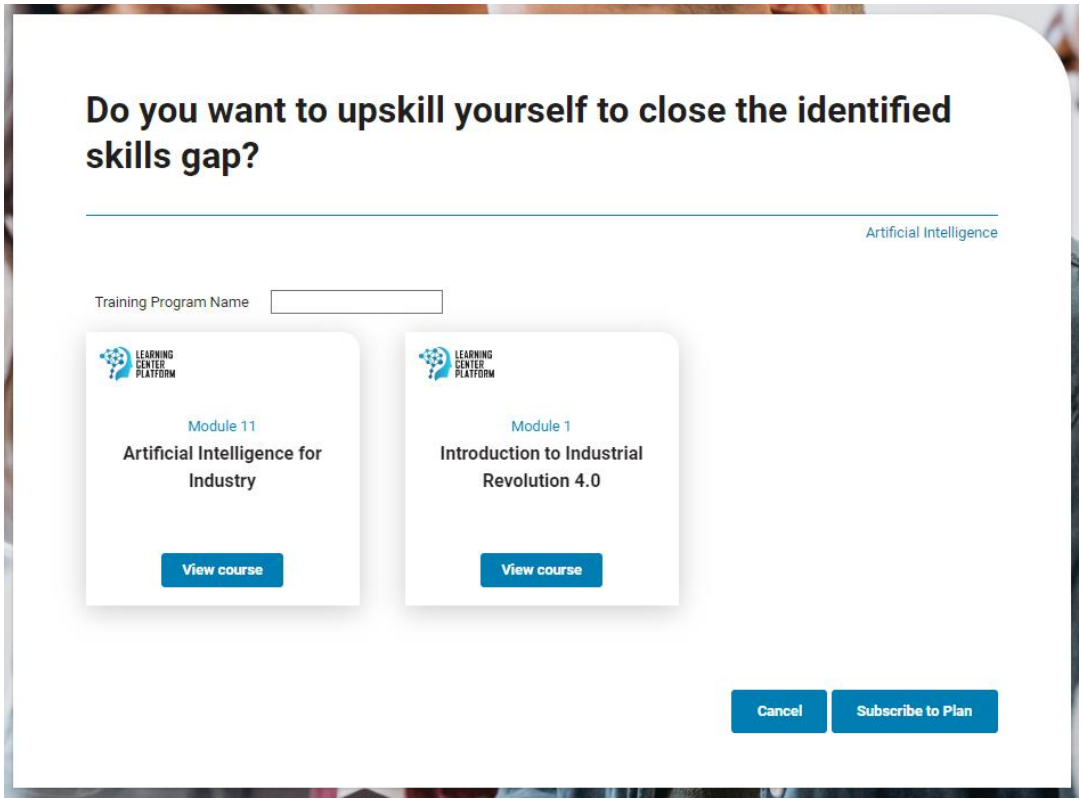

Figure 29 – Making decision about upskilling by choosing "cancel" or "subscribing to the plan".

4.3. Enterprises Individualized Training

Now going through the process of creating a program for an organization (Enterprises Individualized Training) a user can choose a gap to up-skill or create a custom training program. Reminding that a user can only use this option if the account was created as an organization.

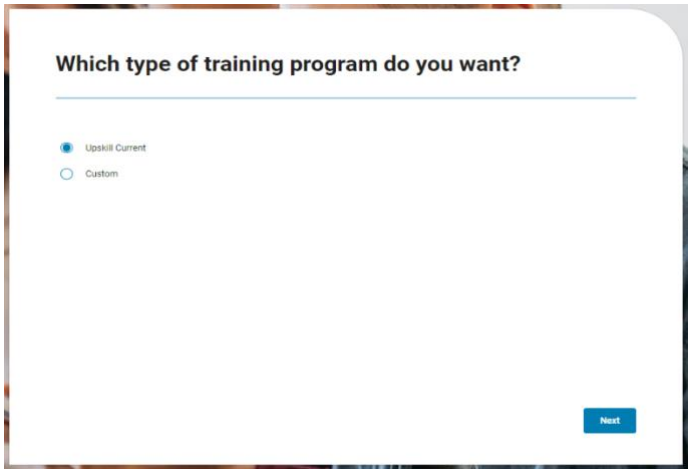

Figure 30 – Choosing up-skill or creating a custom training program.

Any of the two options will ask the users to choose a domain next. First let's enroll in the first option.

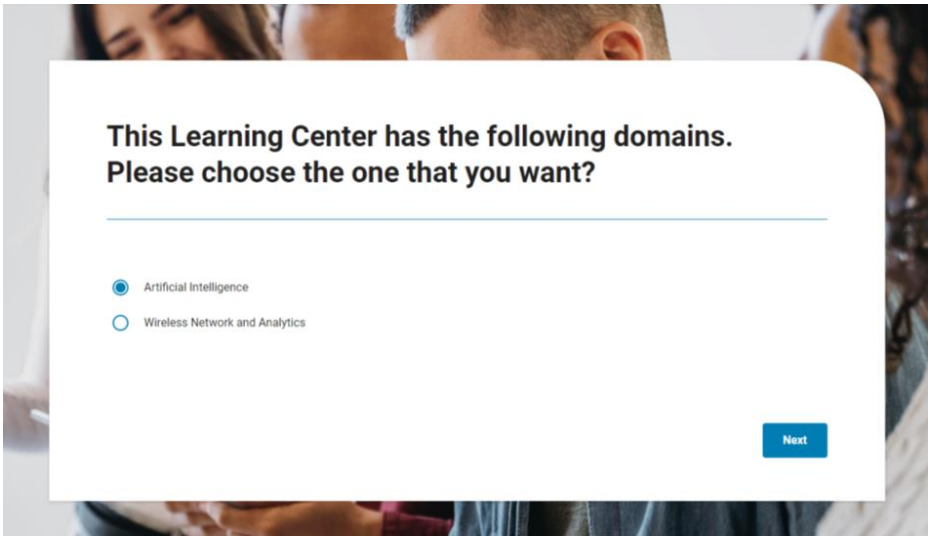

Figure 31 – Choosing a domain.

After choosing a domain the website will show a list of concepts in which the users can up-skill the organization.

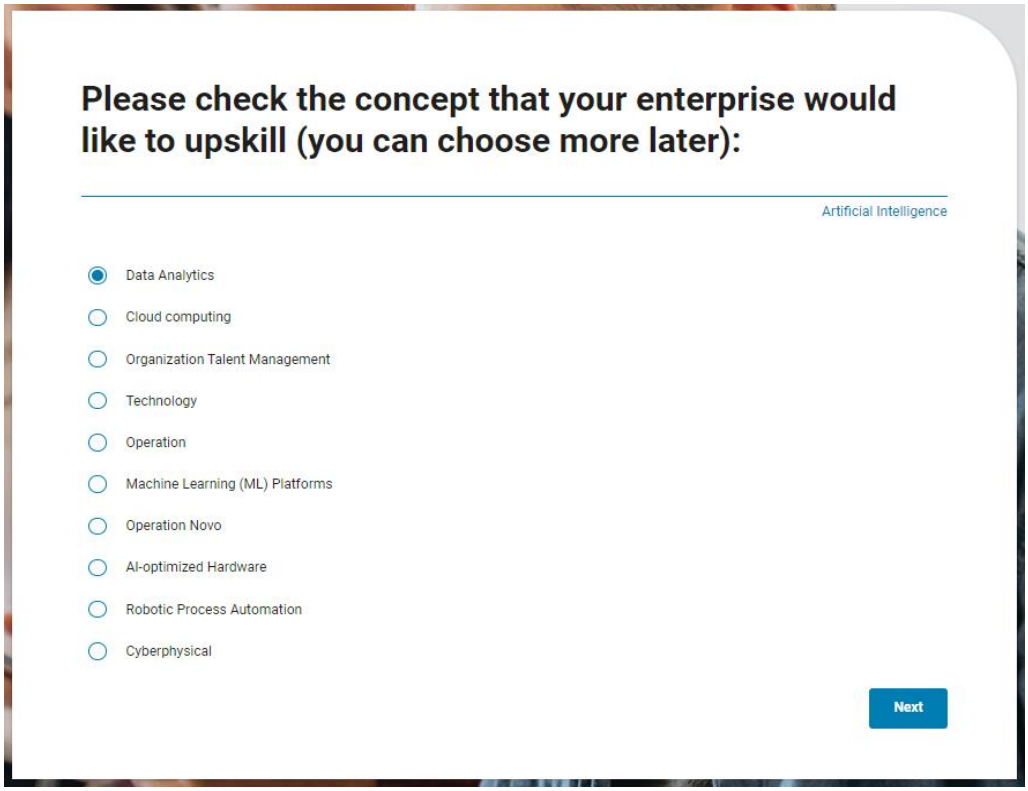

Figure 32 – Choosing the list of concepts.

Now it is the time to define the skill gap by selecting the current level and the desired one by the organization in relation to the chosen concept.

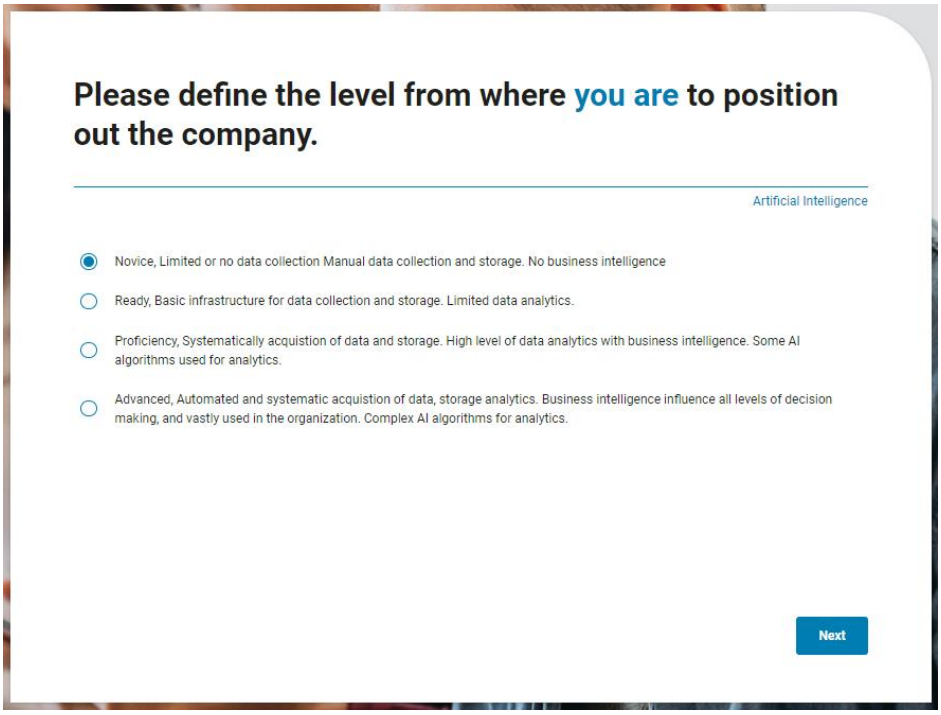

Figure 33 – Choosing the current level.

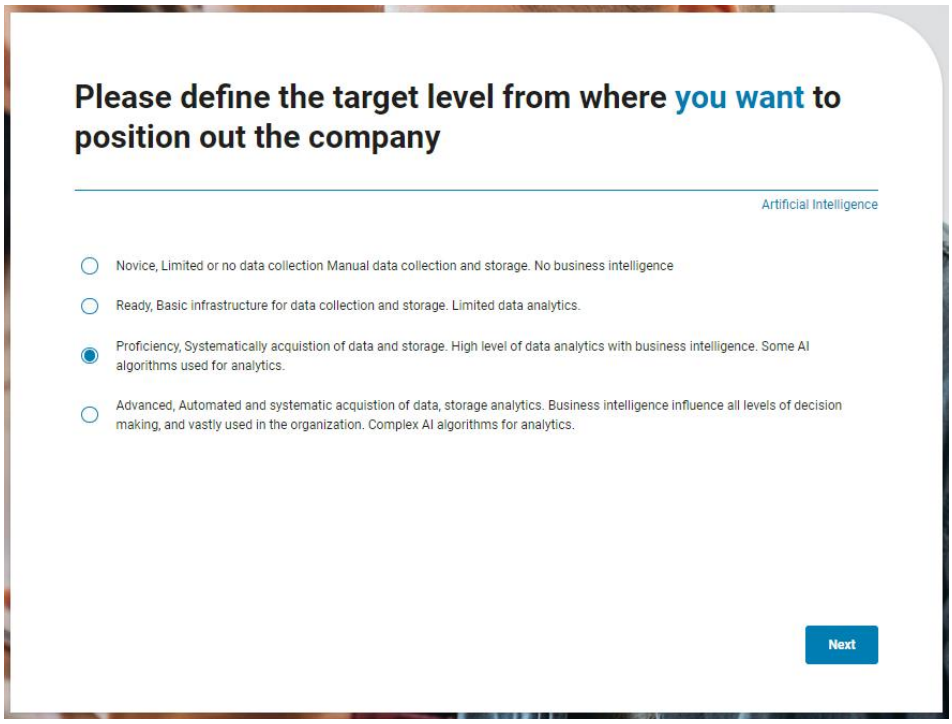

Figure 34 – Choosing the target level.

With the skill gap the website will generate a training program for your organization.

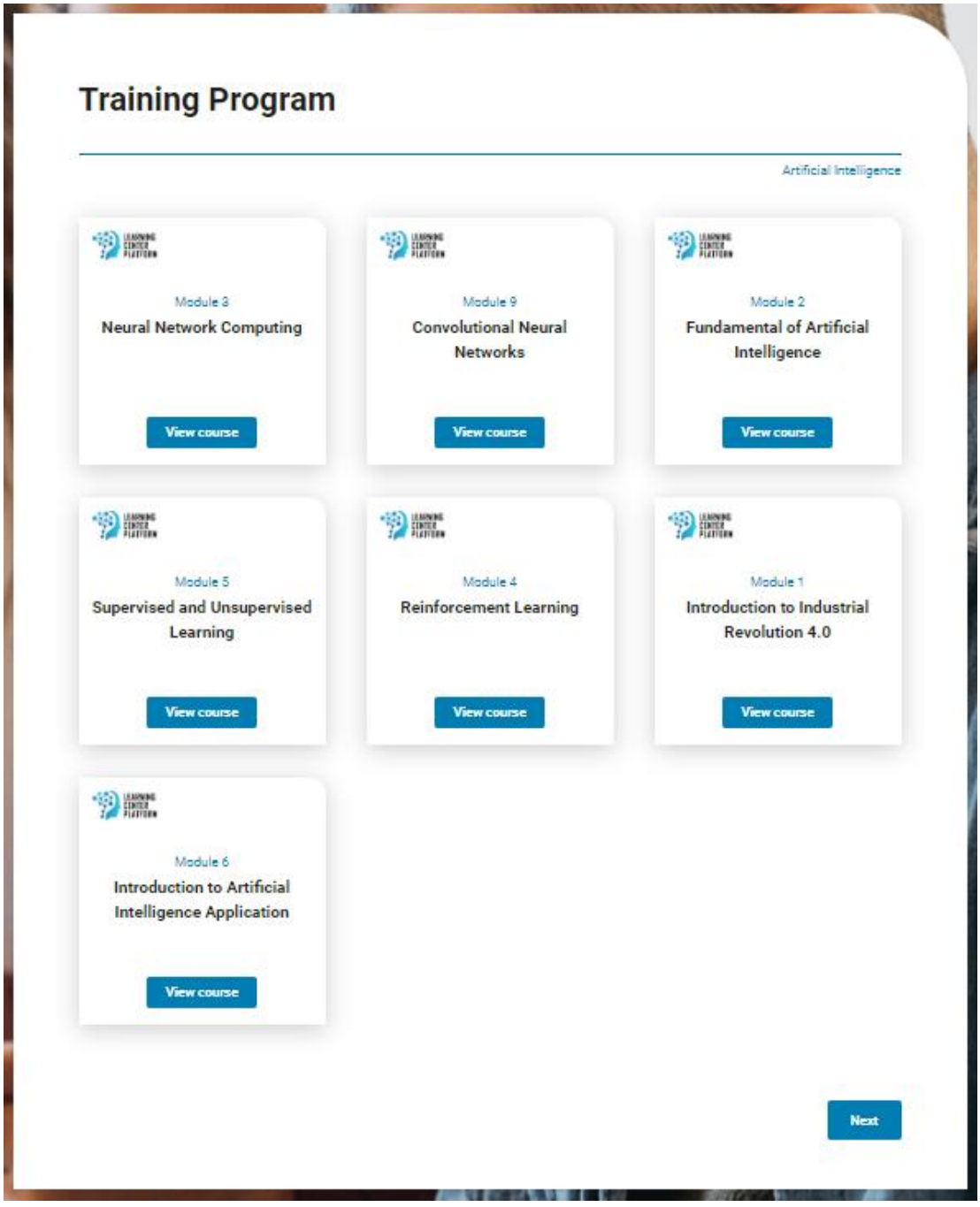

Figure 35 –Training program.

As an organization the users can have multiple people associated and to participate in the training program generated, can assign it to themselves or even associate to people that don't have an account already by entering their corresponding email address.

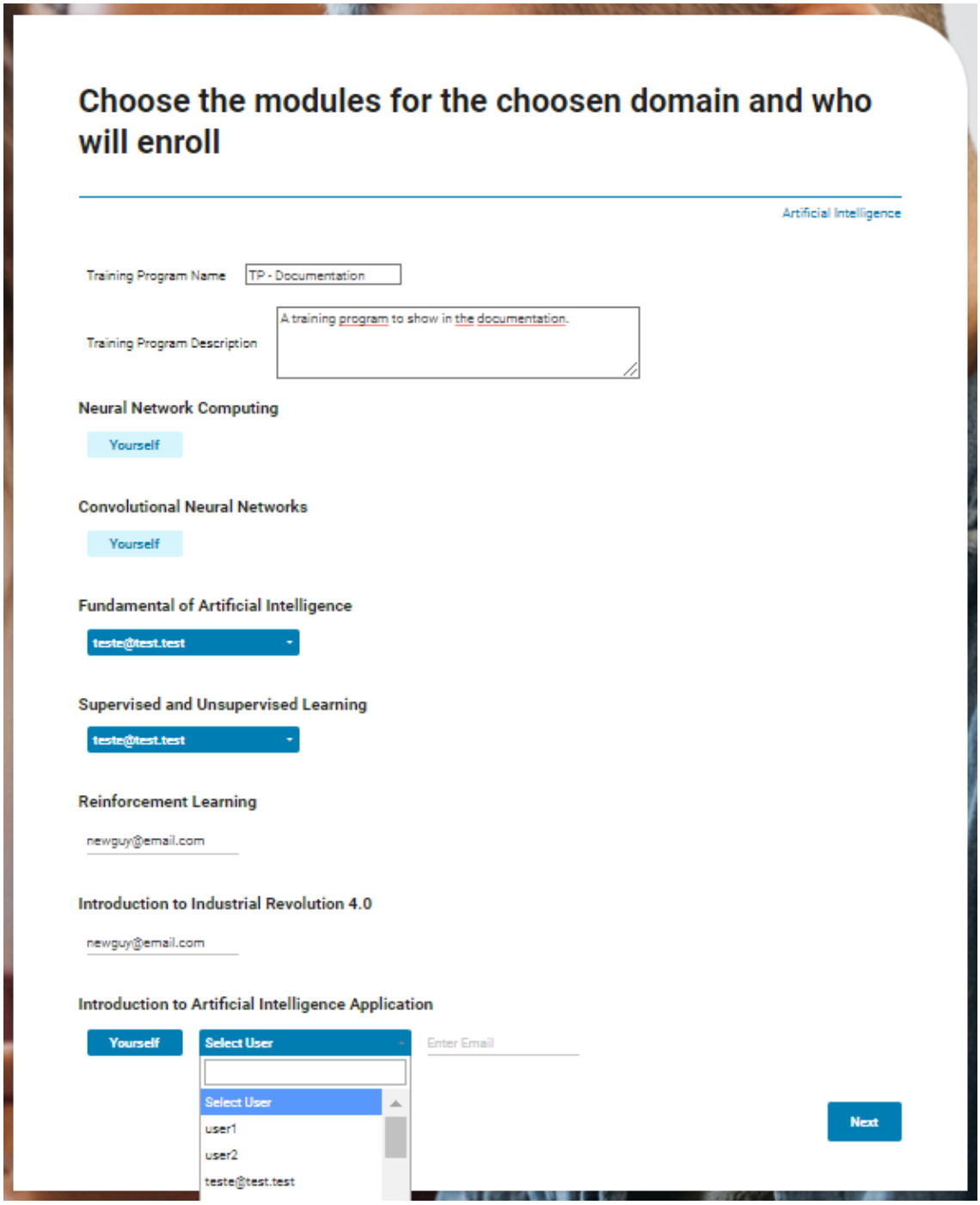

Figure 36 – Choosing the modules.

After that every user mentioned in the previous step will receive this new training program. The organizations have the second possibility mentioned before which is to create a custom training program. After selecting the domain, a list of the corresponding modules will be presented, and the users can select any of them.

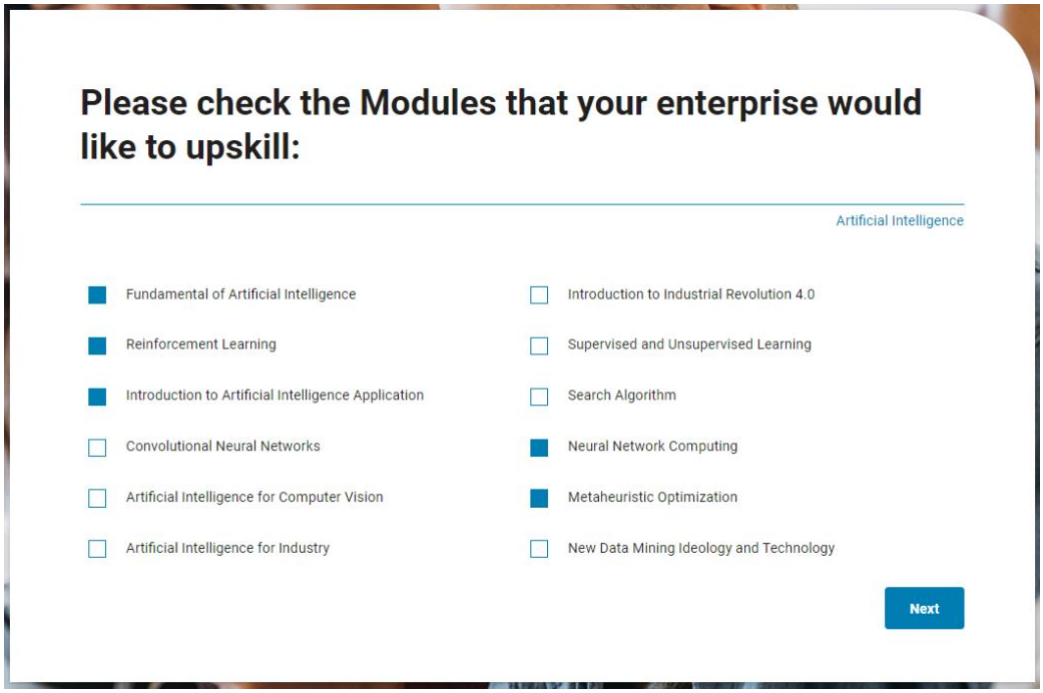

Figure 37 – Choosing the modules.

Then the users just have to choose the people they want as before.

4.4. My Plans

Back in the main page and after a user is logged in a new option will appear to check all the training programs of the user (My plans).

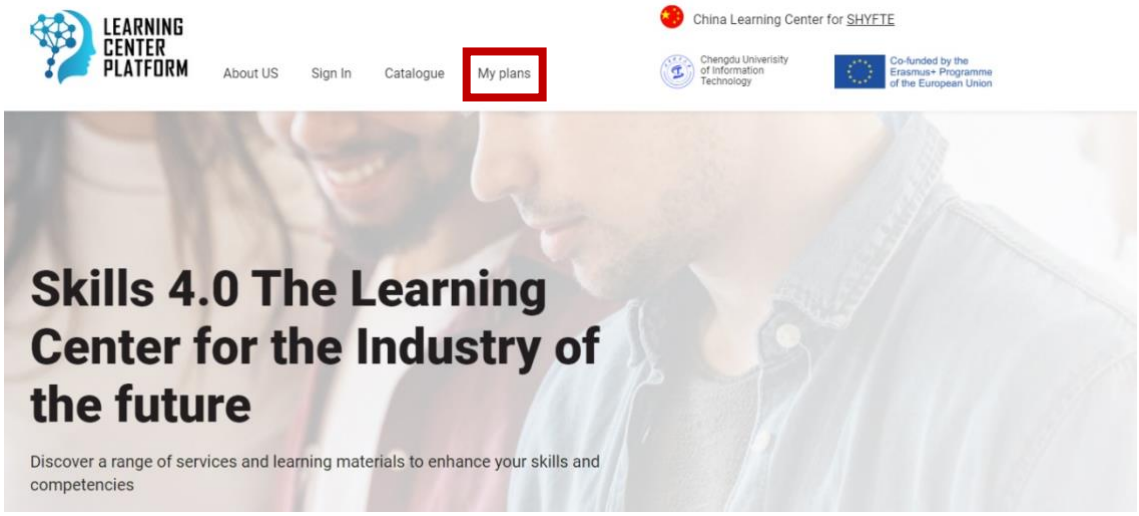

Figure 38 – My plans.

In this page the user will be able to check the current status of all their training programs differentiated in three tabs (created by me, suggested by others, and created by me as enterprise).

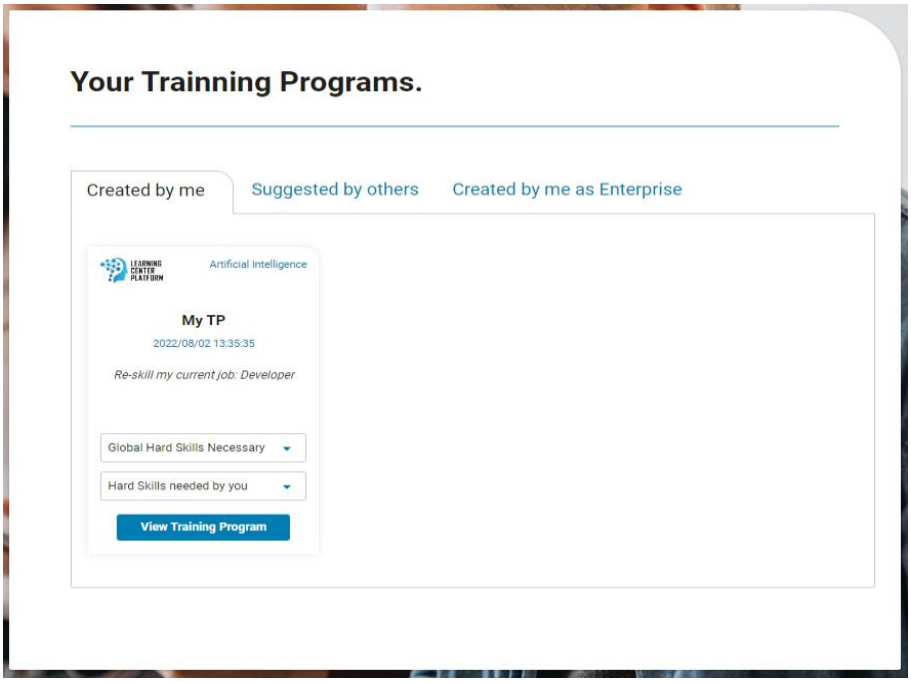

Figure 39 – Training programs (created by me).

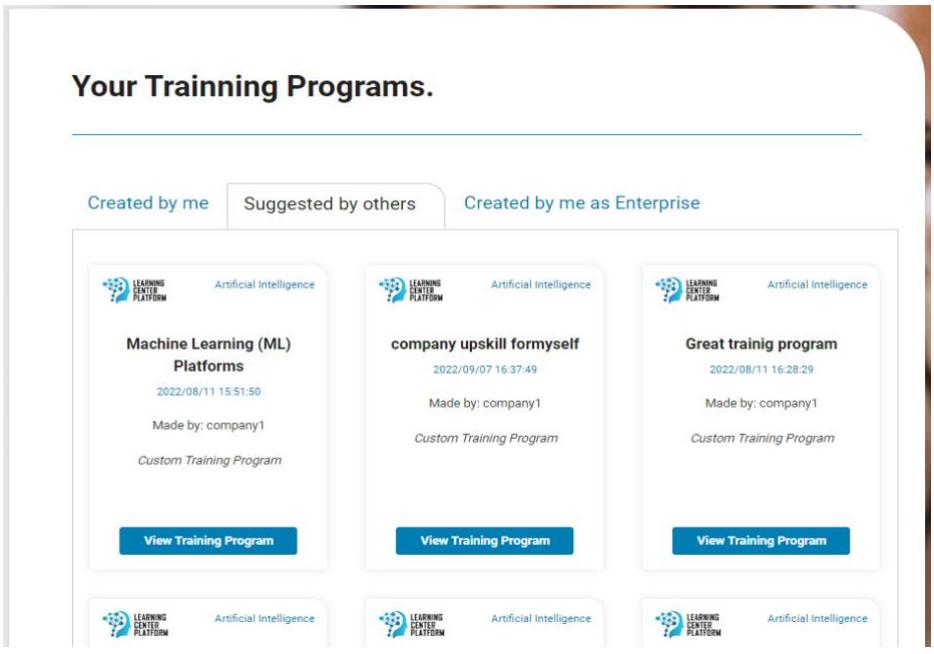

Figure 40 – Training programs (suggested by others).

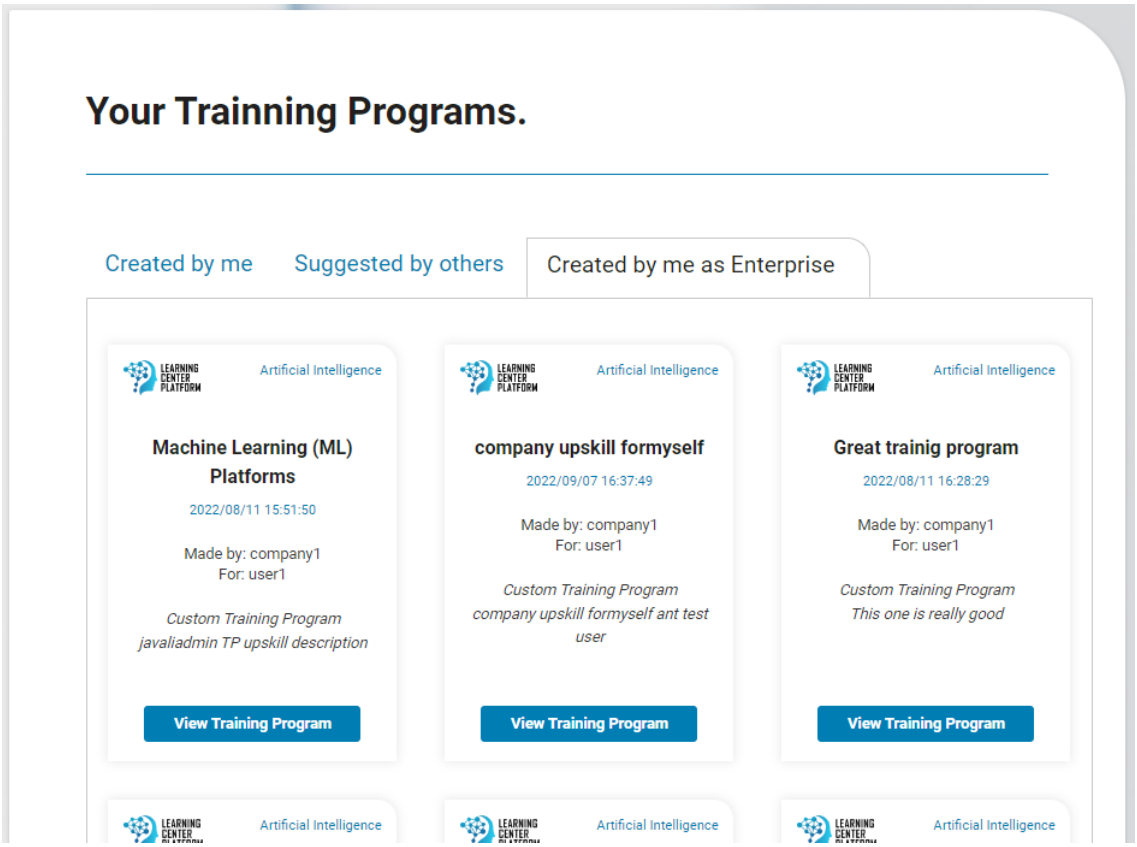

Figure 41 – Training programs (created by me as enterprise).

The users can check the training program's overall status or even the status of each module and other specifications.

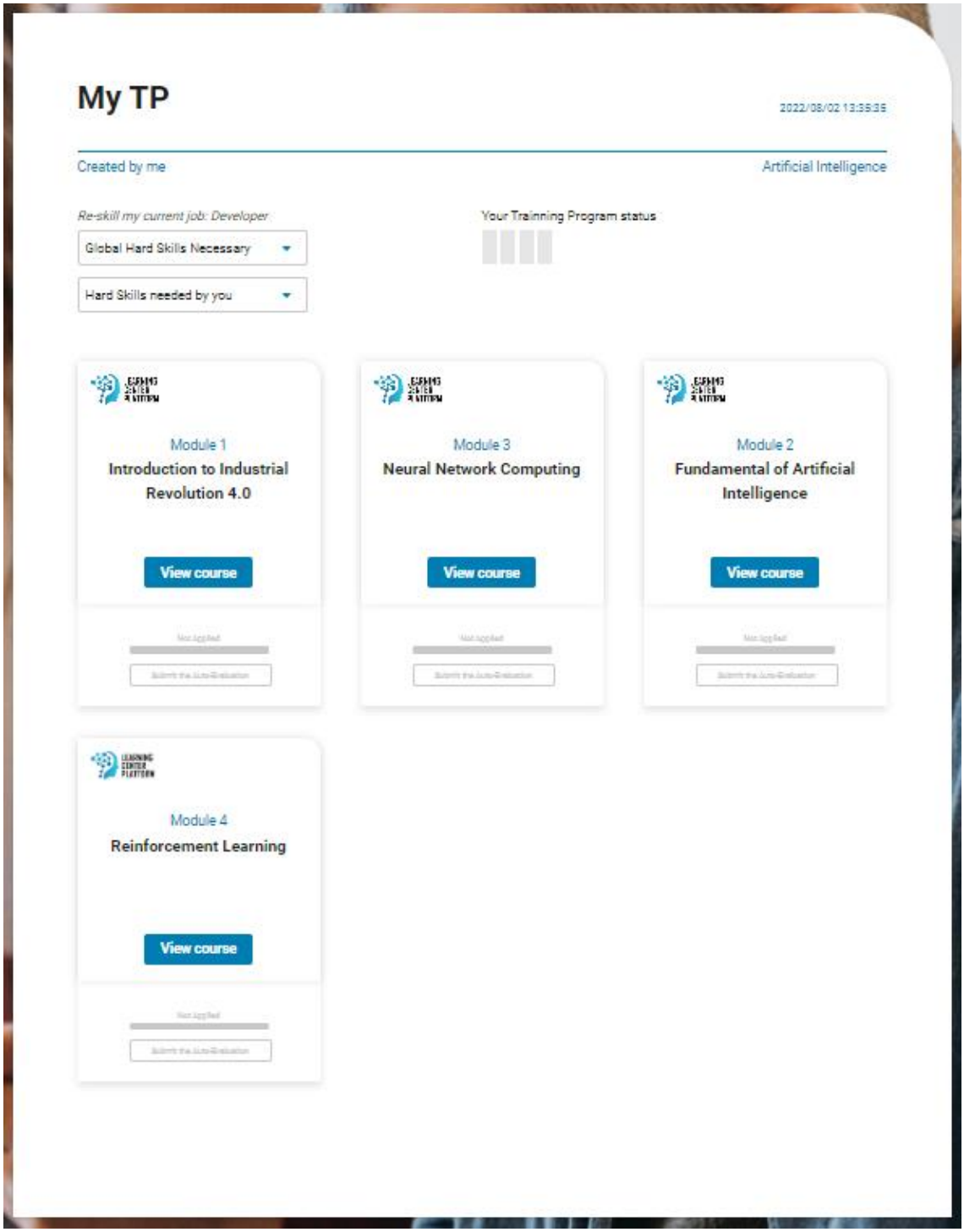

Figure 42 – My training program status.

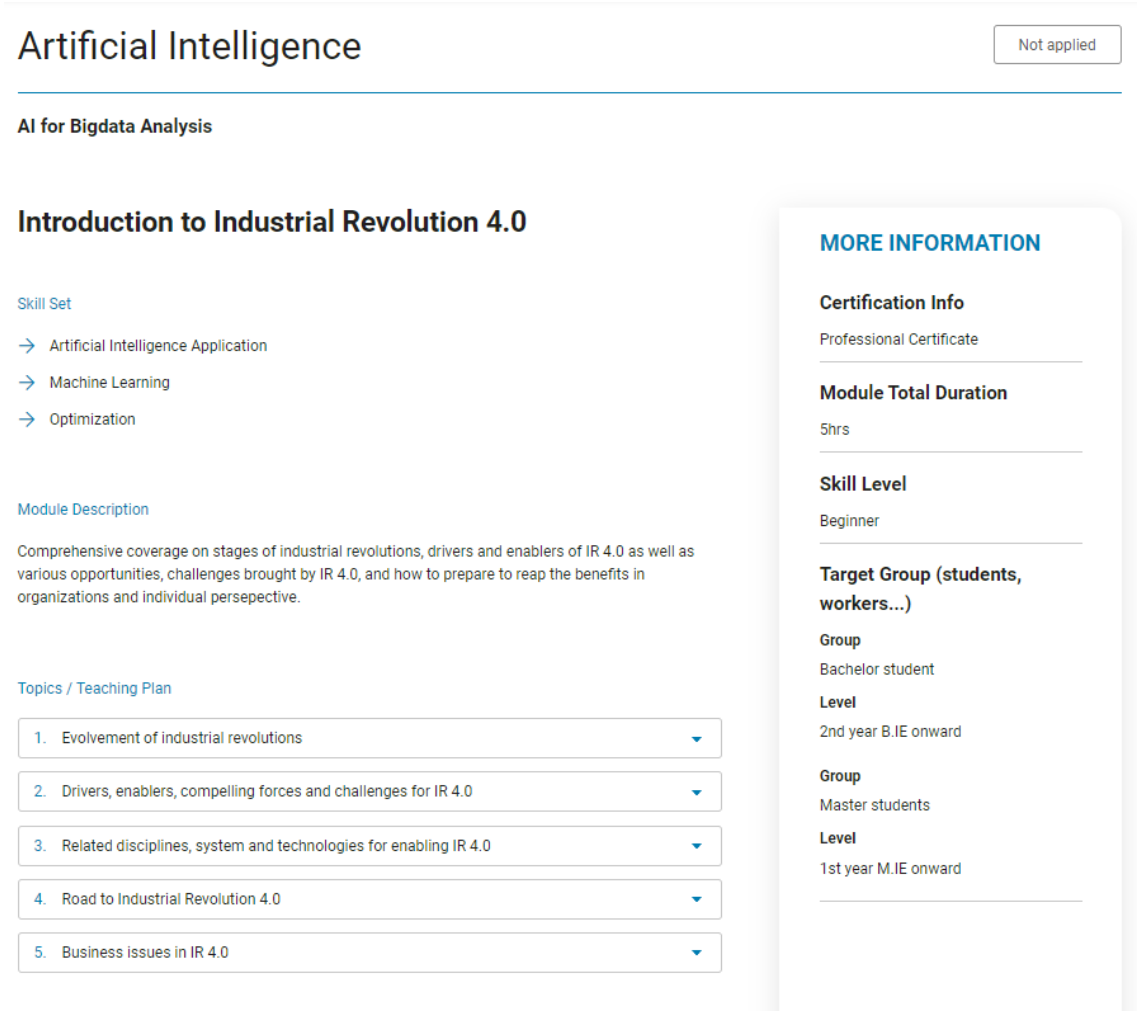

Figure 43 – My training program status.

5. LCE Management Features (Administrator)

There are users with roles to manage the information in the database and the information that is displayed on the website..

5.1. Module update status (https://shyfte.dev9.javali.pt/shyfte/module-managment):

It is possible to update the module status of all users that have the module in their training program or just to some specific users. The procedure is described in the images below.

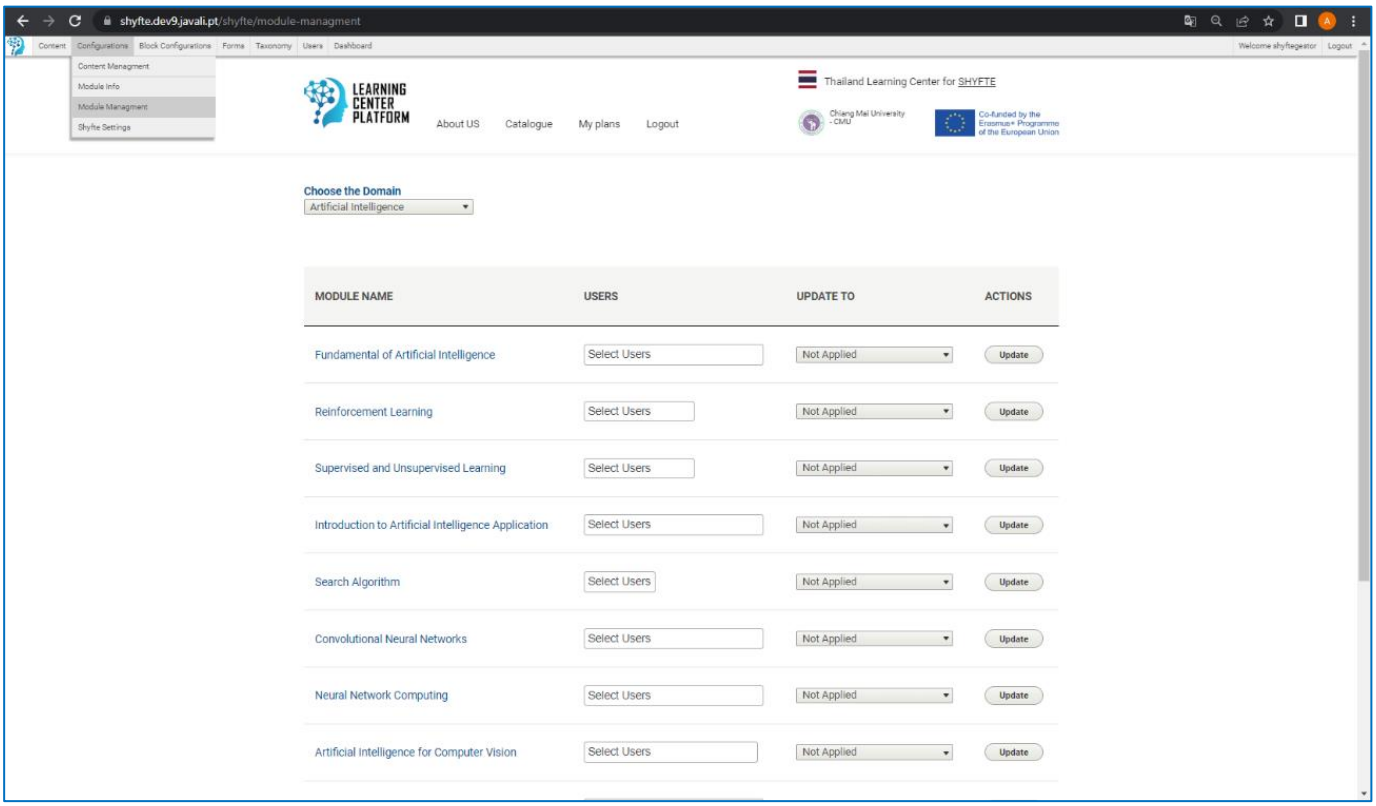

Figure 44 – Updating the module status of all users.

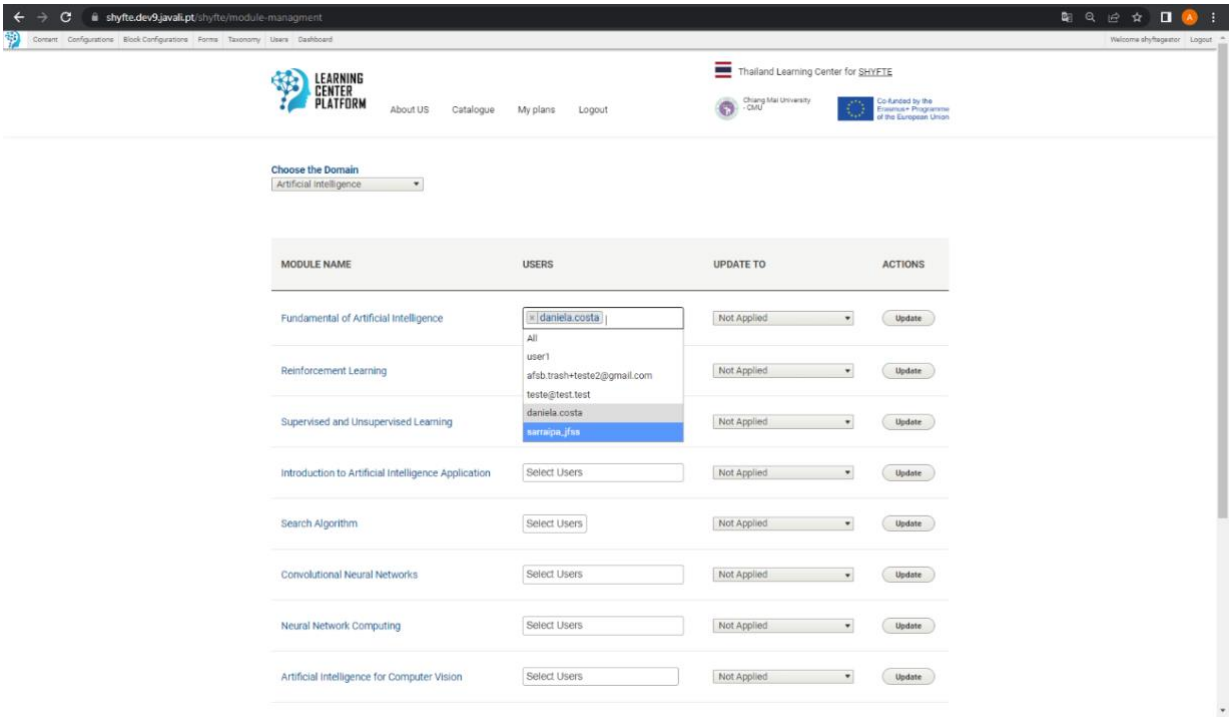

Figure 45 – Updating the module status of all users.

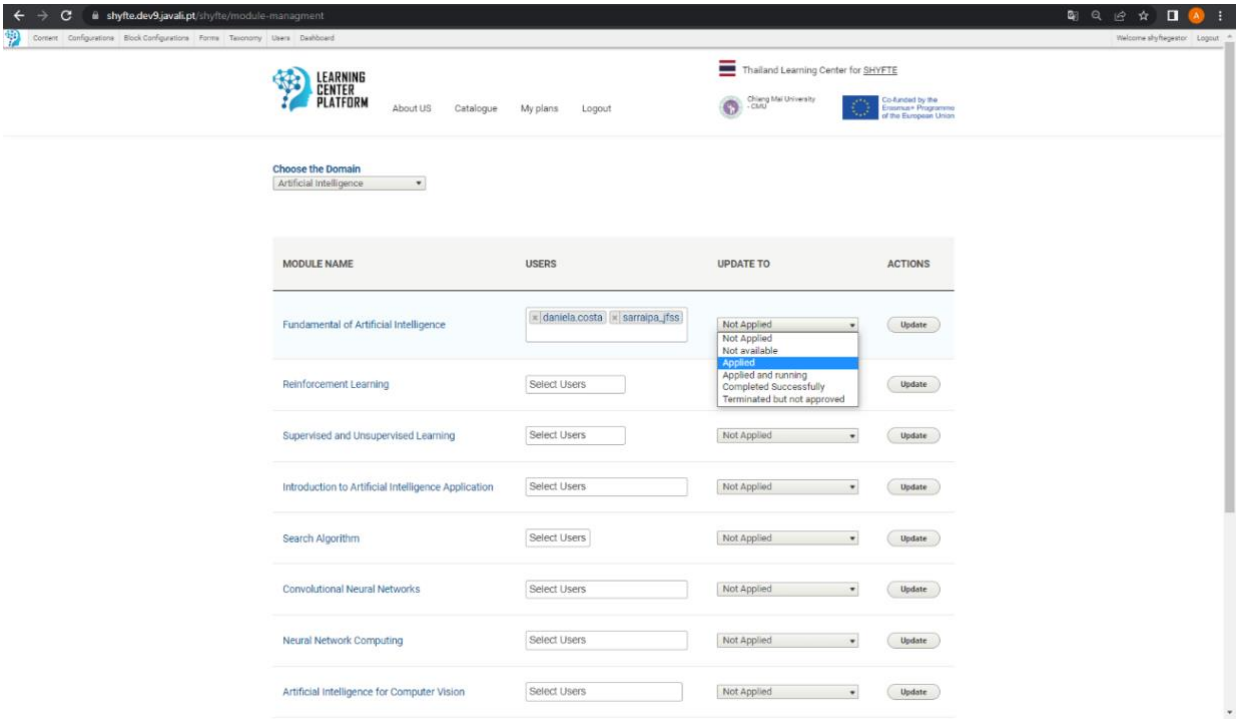

Figure 46 – Updating the module status of all users.

5.2. Feedback statistics (https://shyfte.dev9.javali.pt/admin/reports/shyfte-dashboard):

The user can leave their feedback about a module when it is finished, then all the feedbacks can be seen in the dashboard page.

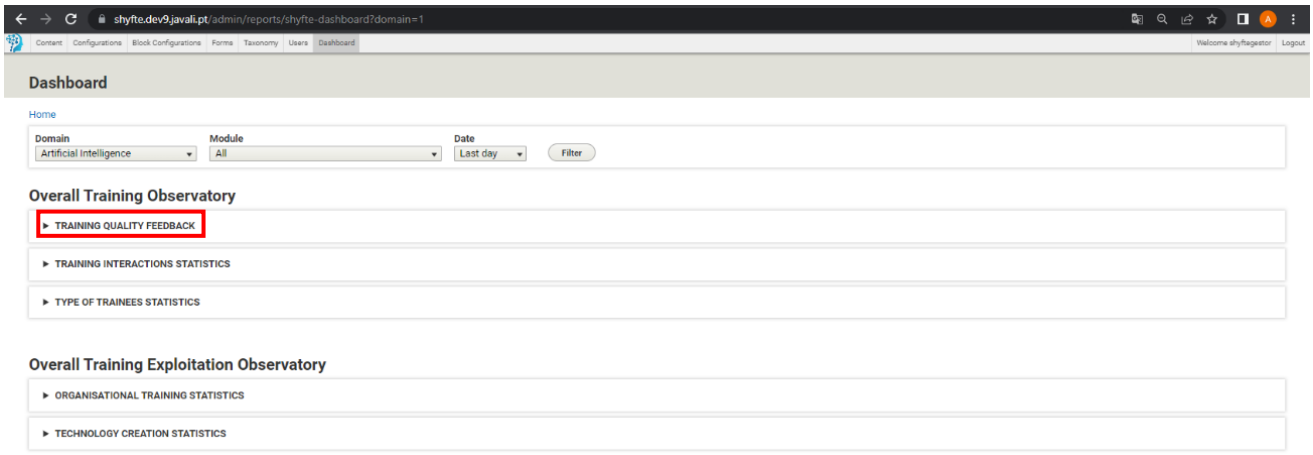

Figure 47 – Leaving feedback about a module.

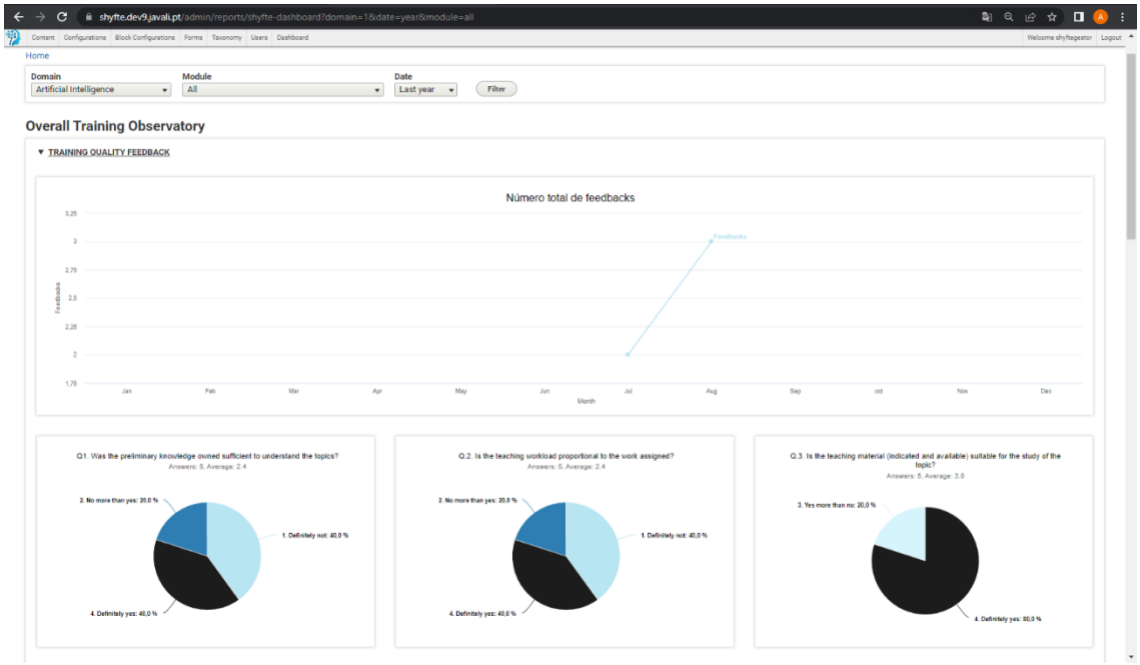

Figure 48 – Overall training observatory.

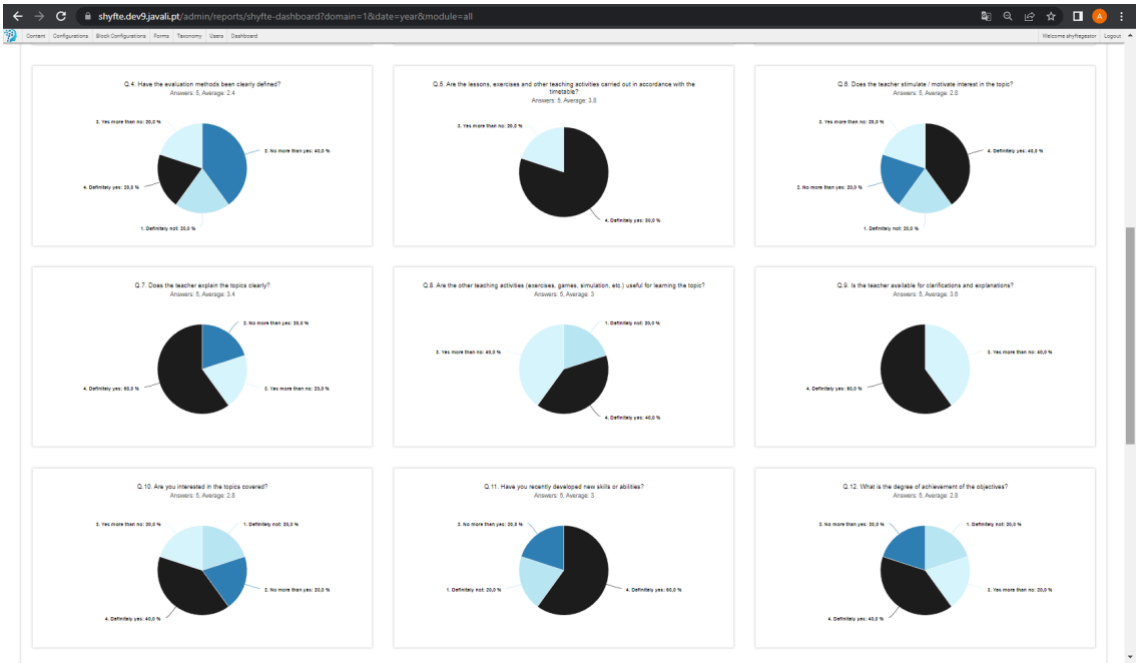

Figure 49 – Overall training observatory.

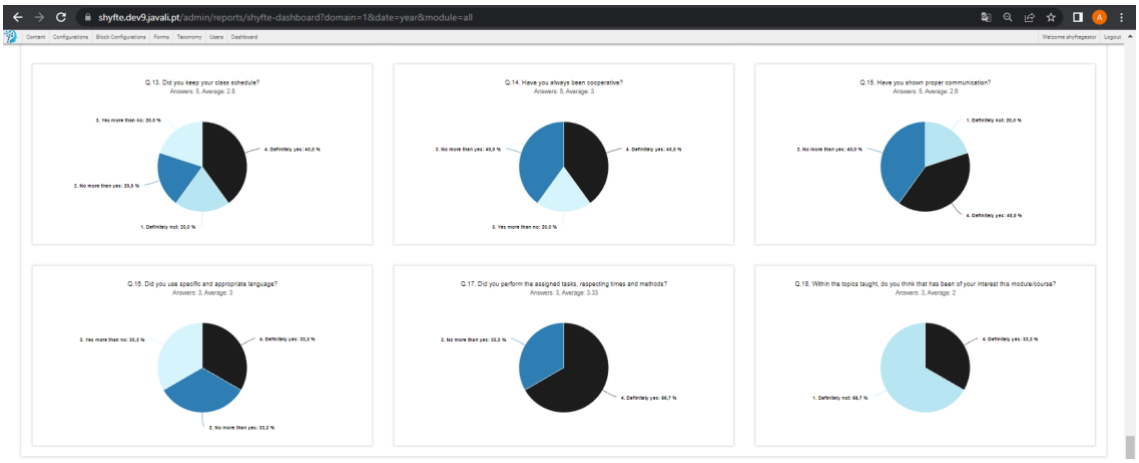

Figure 50 – Overall training observatory.

5.3. Training support form (https://shyfte.dev9.javali.pt/shyfte/training-support):

Any question or information about the training programs can be asked in the training support form by selecting a domain and subject with the question.

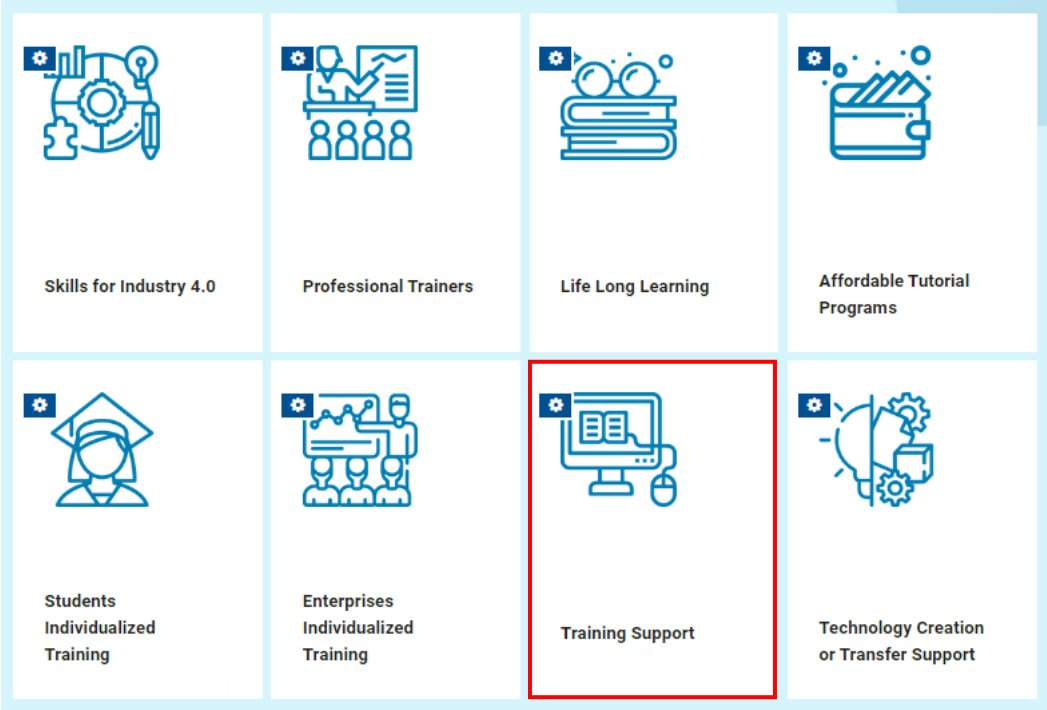

Figure 51 – Providing information through training support.

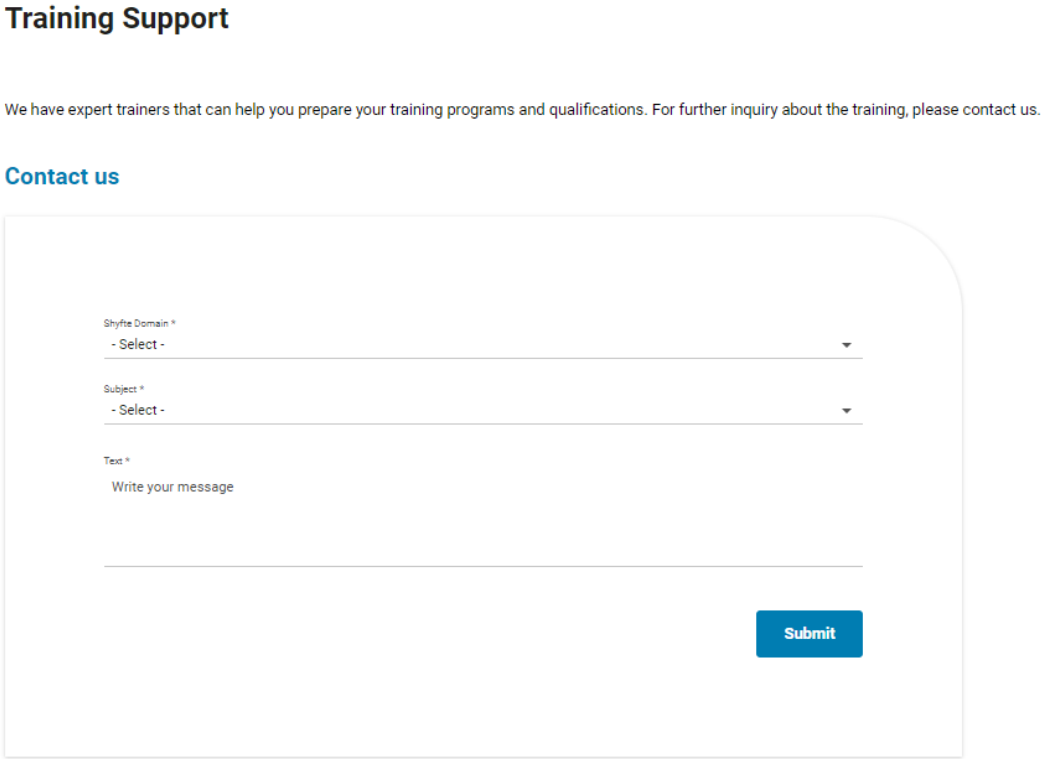

Figure 52 – Providing information through training support.

Also, an account with access to the dashboard already mentioned can check all the statistics regarding the interaction between the users and this form.

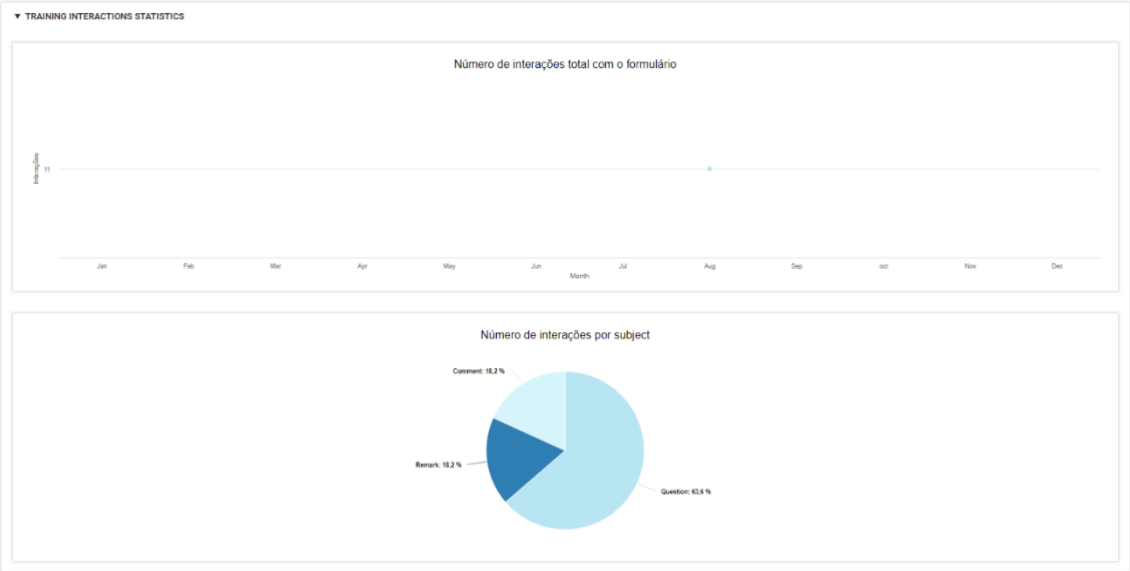

Figure 53 – Sample of training interactions statistics.

Figure 54 – Sample of type of training statistics.

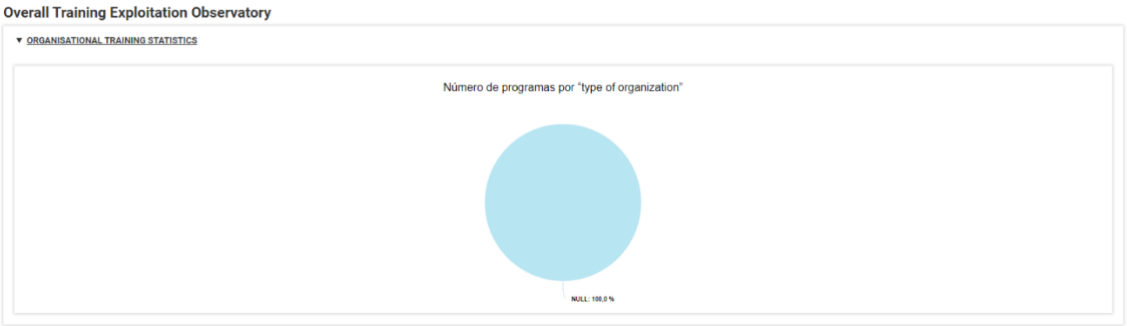

Figure 55 – Sample of overall training exploitation observatory.

5.4. Technology creation or transfer support form

(https://shyfte.dev9.javali.pt/shyfte/technology-creation-or-transfer-support):

This second form has a more innovative view about support and exists to help user's innovation that reflects the knowledge given by the learning center. This means that if the users have any problem with some project, either a prototype or just an idea, they can ask for extra help to all available teachers.

This way is possible to analyze information about know creators and innovation regarding the learning center.

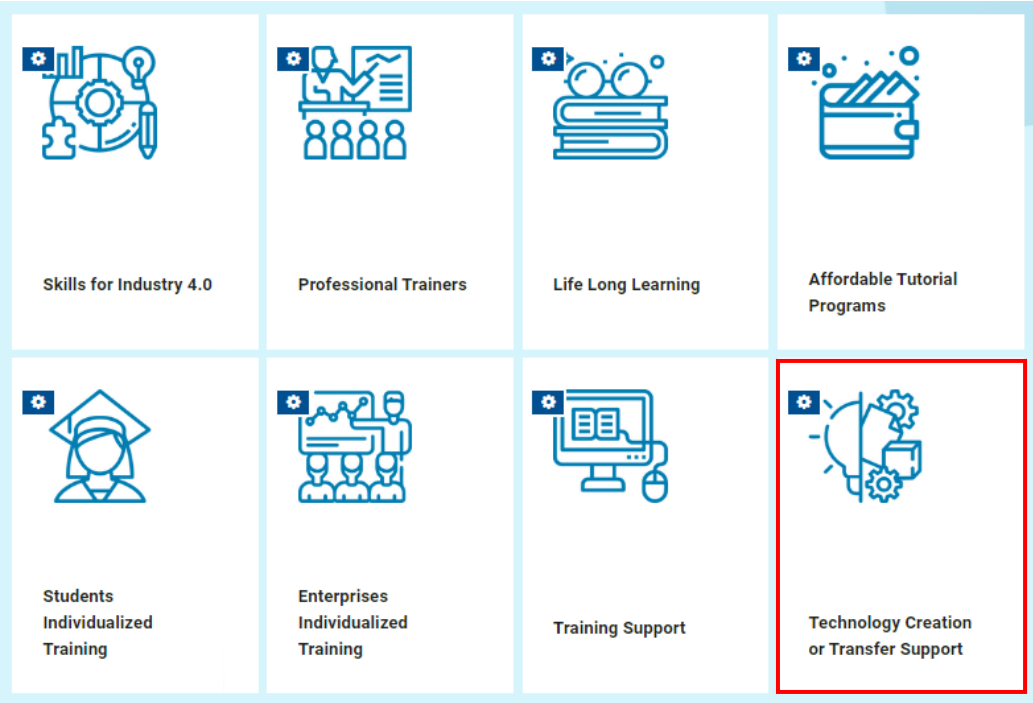

Figure 56 – Technology creation or transfer support.

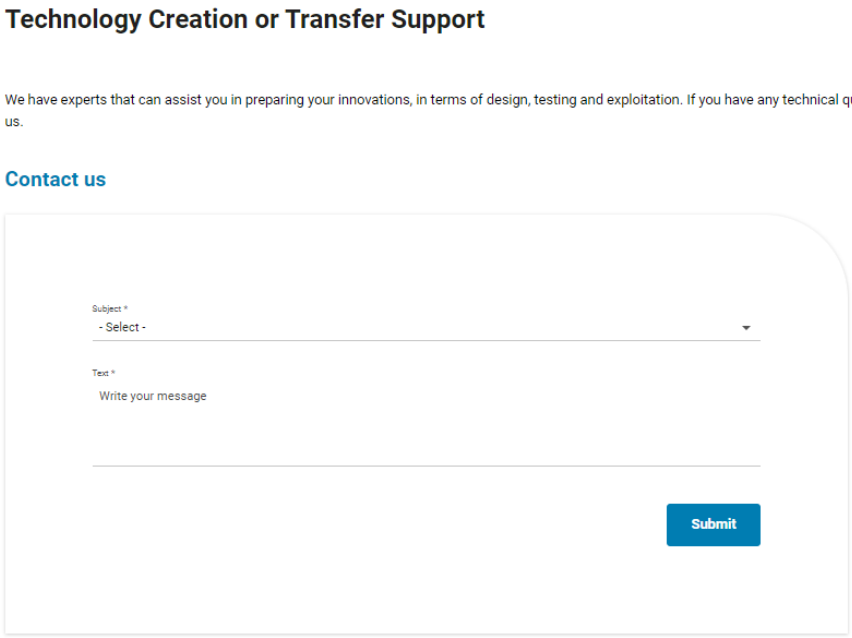

Figure 57 – Technology creation or transfer support.

Again, an account with access to the dashboard can check all the statistics regarding the interaction between the users and this form.

Figure 58 – Sample of technology creation statistics.

5.5. Taxonomy (https://shyfte.dev9.javali.pt/admin/structure/taxonomy):

In the taxonomy section it is possible to check the all the entities in the database that can be used to create other more complex entities like modules or jobs. Above is the domain example.

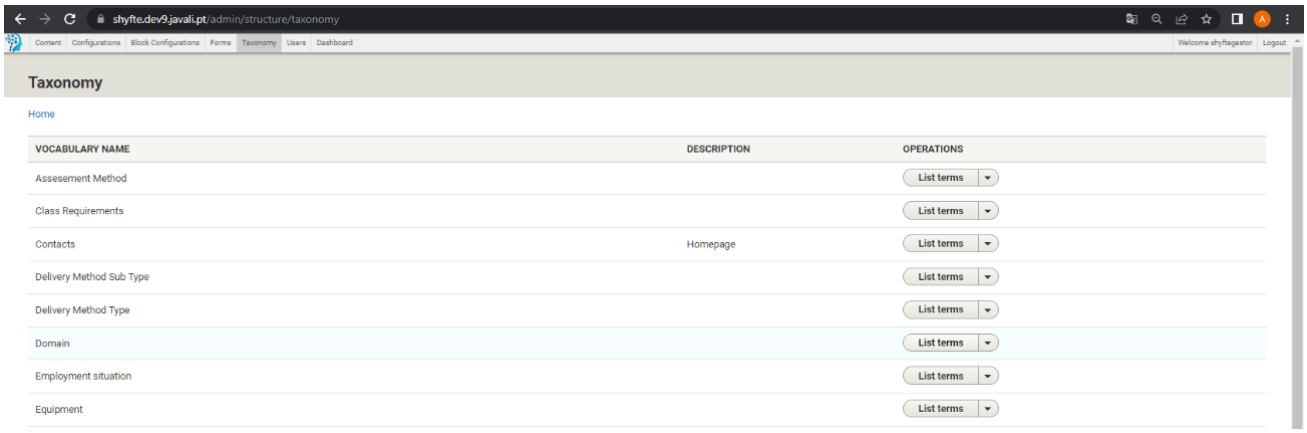

Figure 59 – Taxonomy section.

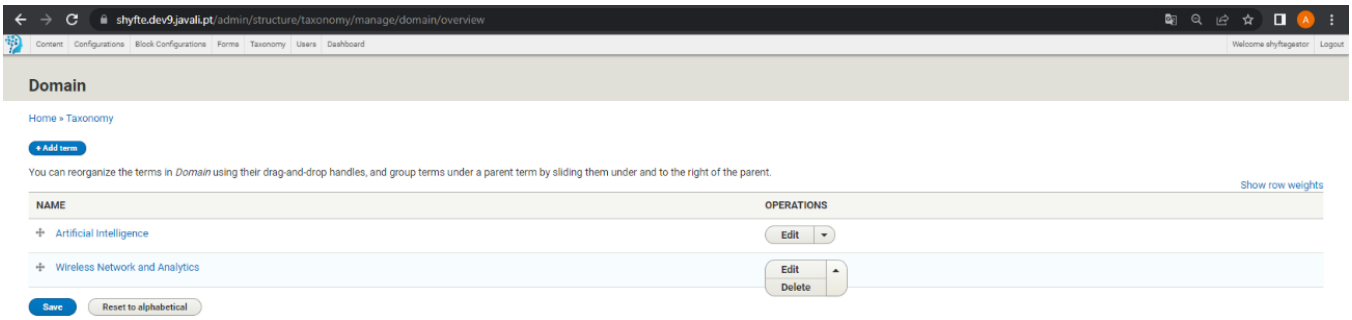

Figure 60 – Domain section.

It is possible to create a new one, edit an existing one or delete it.

Module management (https://shyfte.dev9.javali.pt/admin/content):

This section allows the user to list all the existing modules, edit any of them, delete and create new ones.

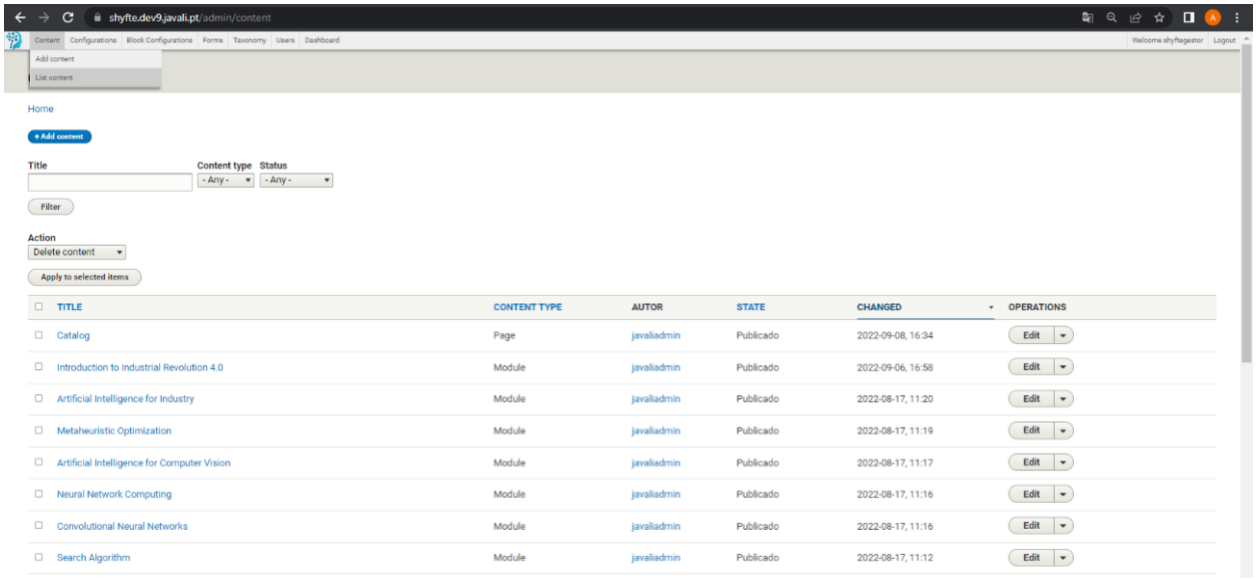

Figure 61 – Sample of existing modules.

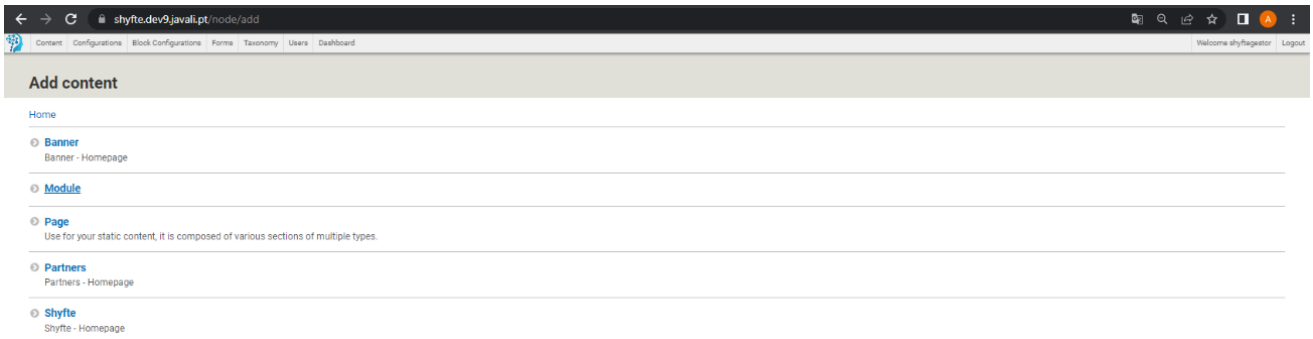

Figure 62 – Add content.

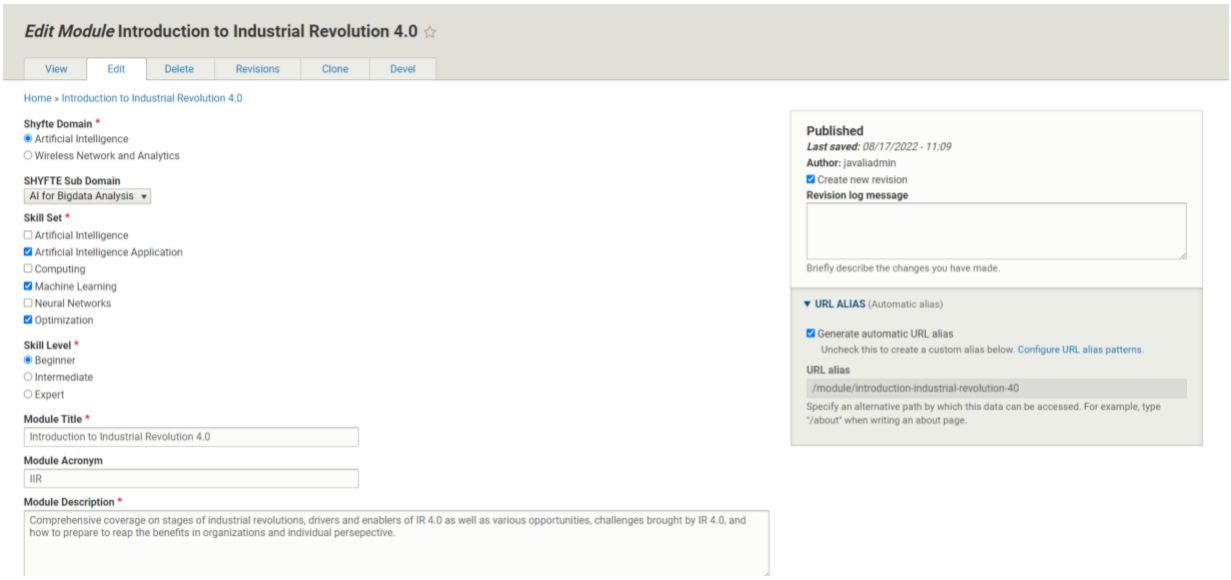

Figure 63 – Editing modules.

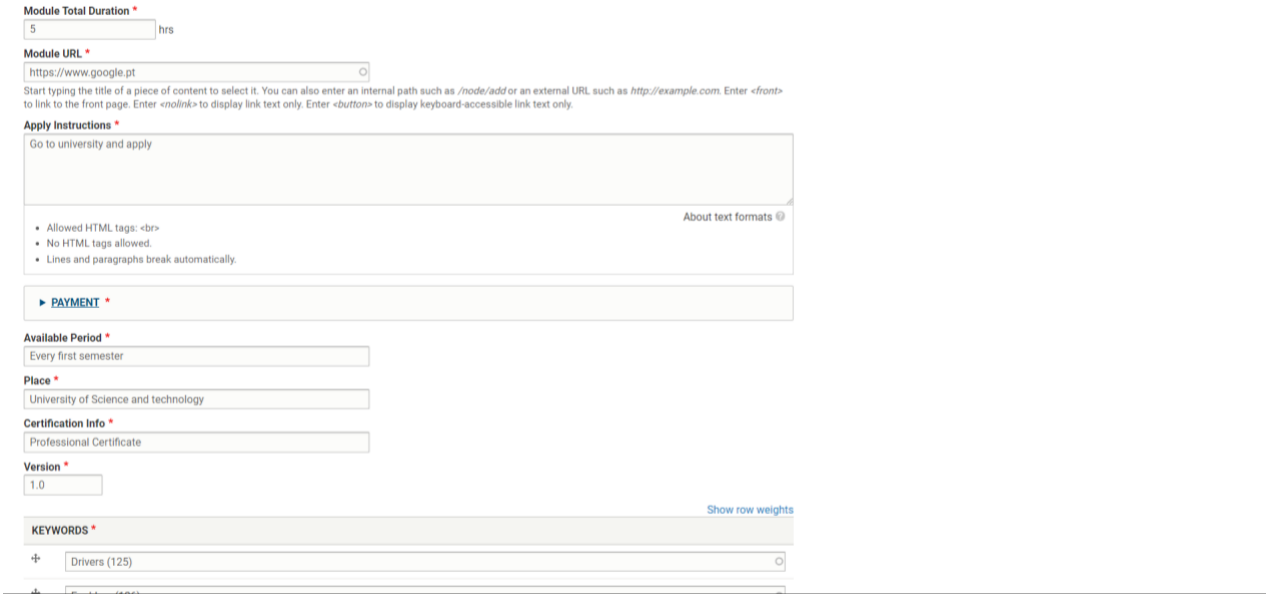

Figure 64 – Editing modules.

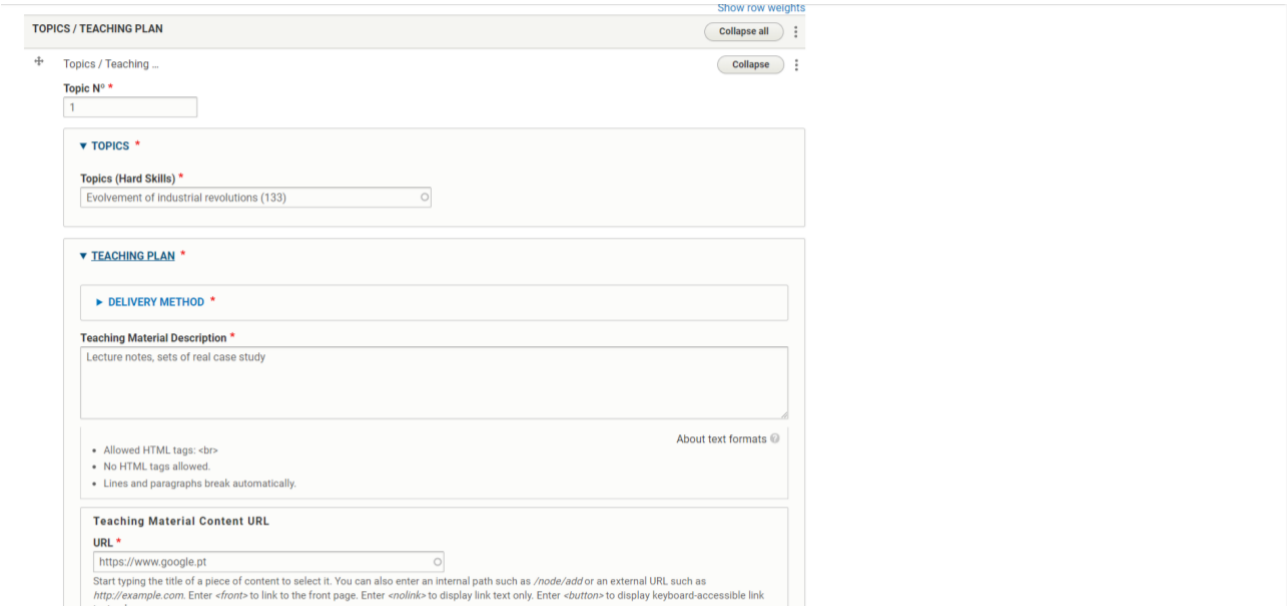

Figure 65 – Editing modules.

This digital form to create a module it's based on the excel example given and has all it's information displayed.

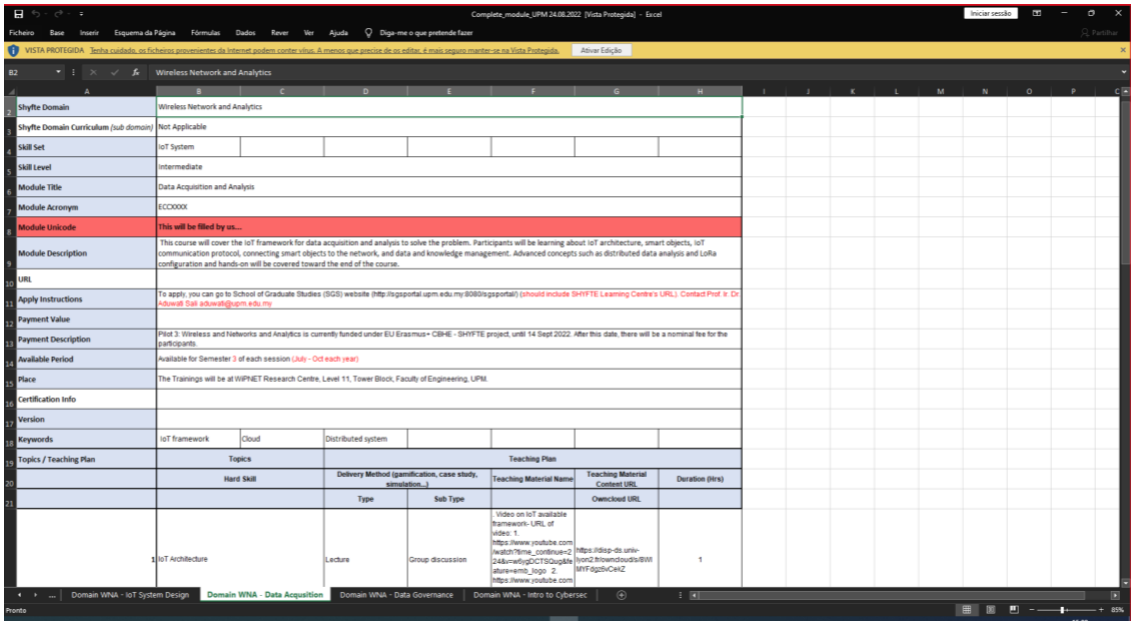

Figure 66 – Sample of a digital form to create a module.

5.6. Job management (https://shyfte.dev9.javali.pt/admin/config/system/back-office):

This section is similar to the module management and allows the user to create, edit or delete a job.

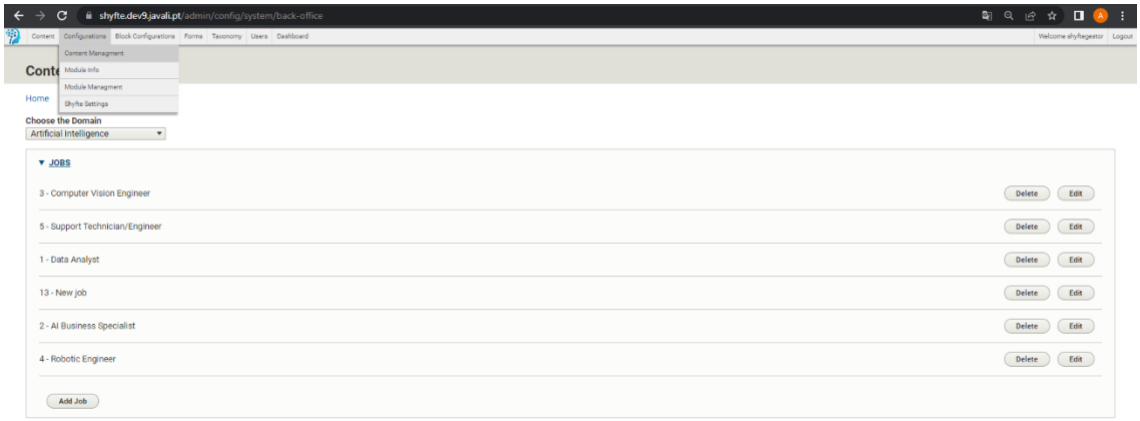

Figure 67 – Creating, editing, or deleting a job.

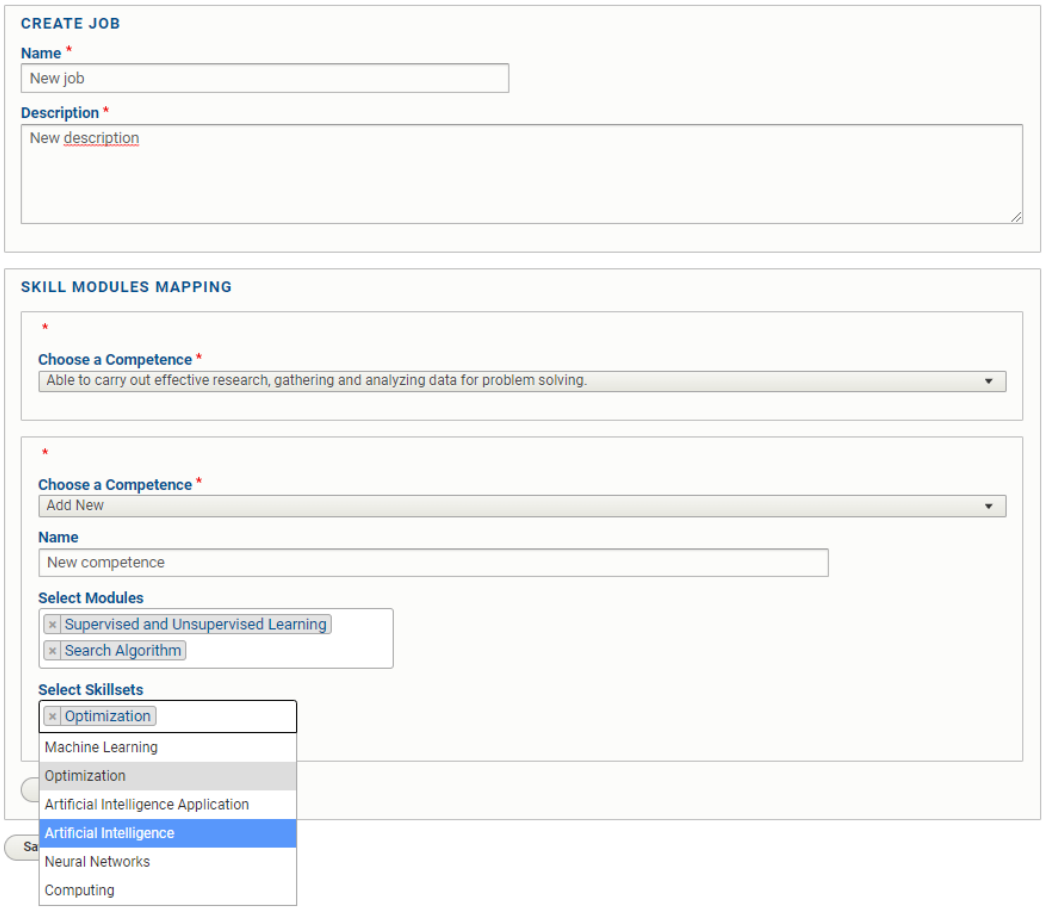

Figure 68 – Creating, editing, or deleting a job.

The job also follows the excel structure previous created.

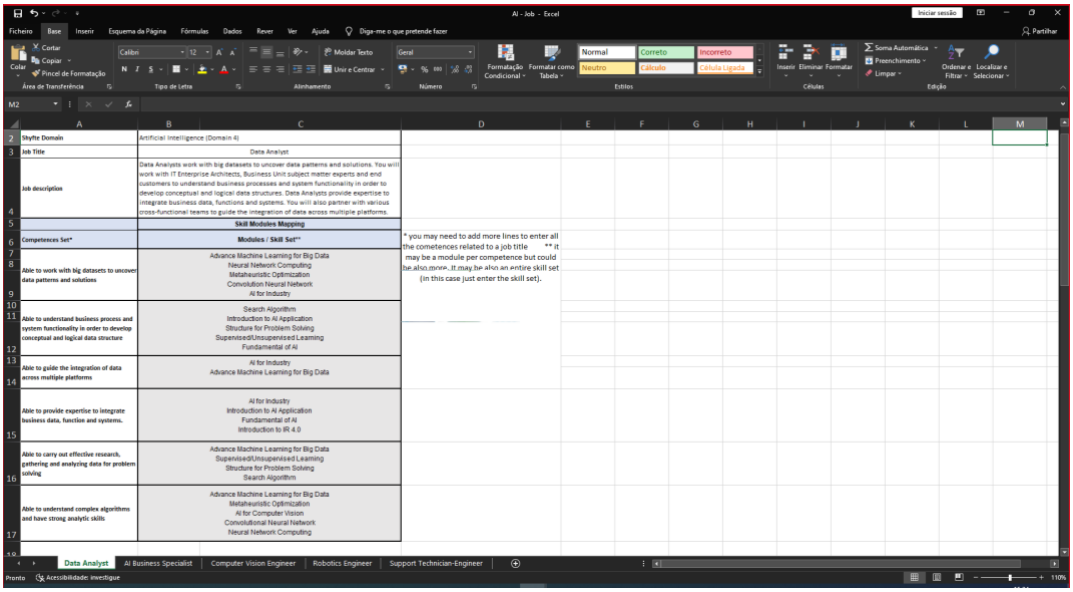

Figure 69 – Following the sample of a digital form.

5.7. Matrix management (https://shyfte.dev9.javali.pt/admin/config/system/back-office):

This section is placed below the job management tools and follows exactly the same model of workflow.

Figure 70 – Concept matrix.

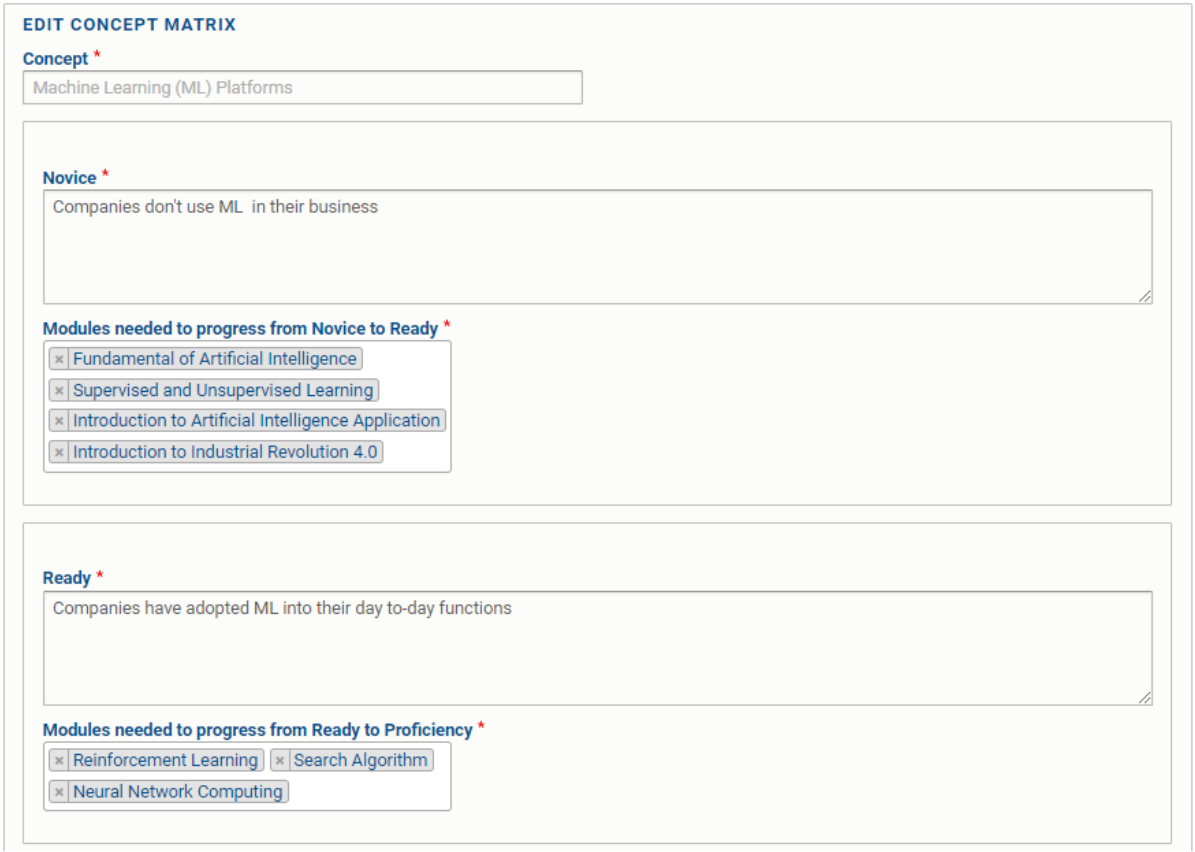

Figure 71 – Editing the concept matrix.

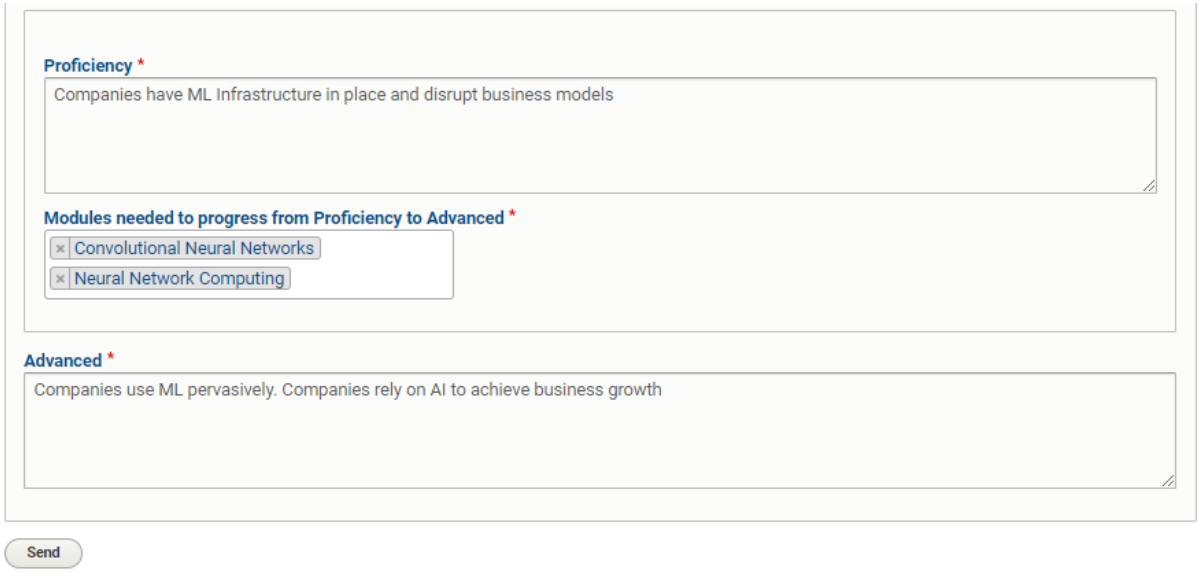

Figure 72 – Editing the concept matrix.

As before, this section also follows the excel structure decided previously.

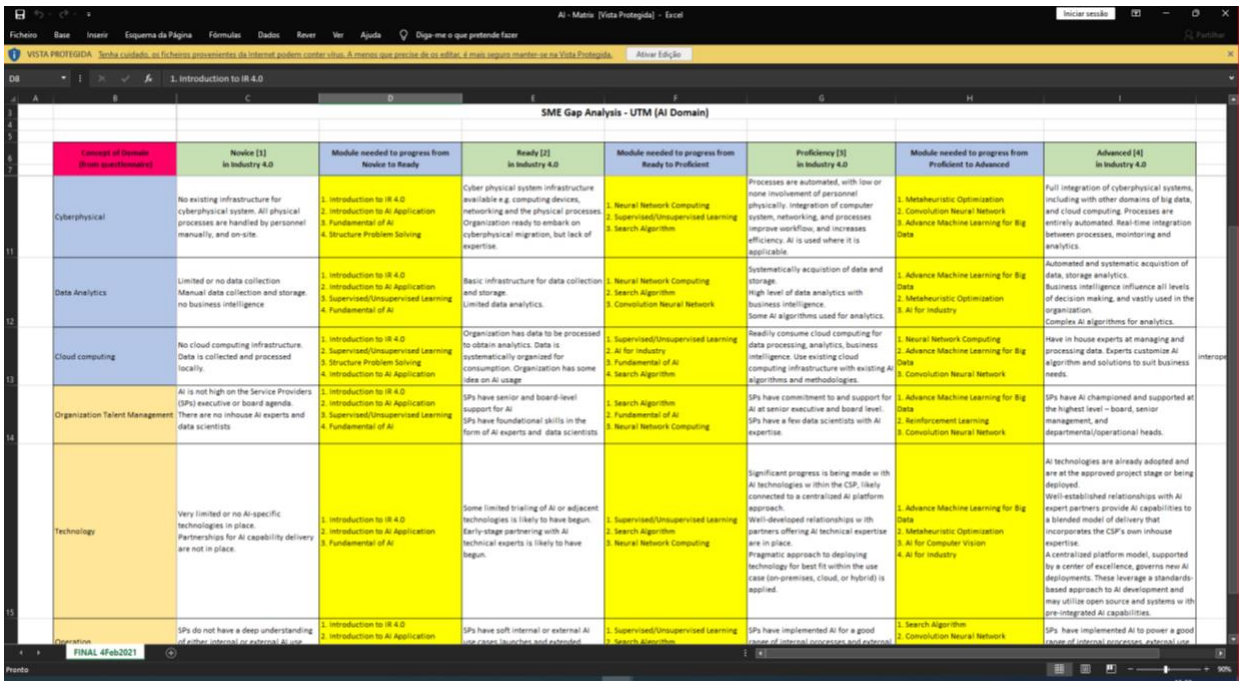

Figure 73 – Following the sample of a digital form.

5.8. Portal edition (https://shyfte.dev9.javali.pt/admin/config/system/settings):

In this last section, the user is able to update the authentication token, the URL for the webservices and change the view of the website depending on the learning center.

It is possible to change the images presented in the header and all the titles and URLs needed.

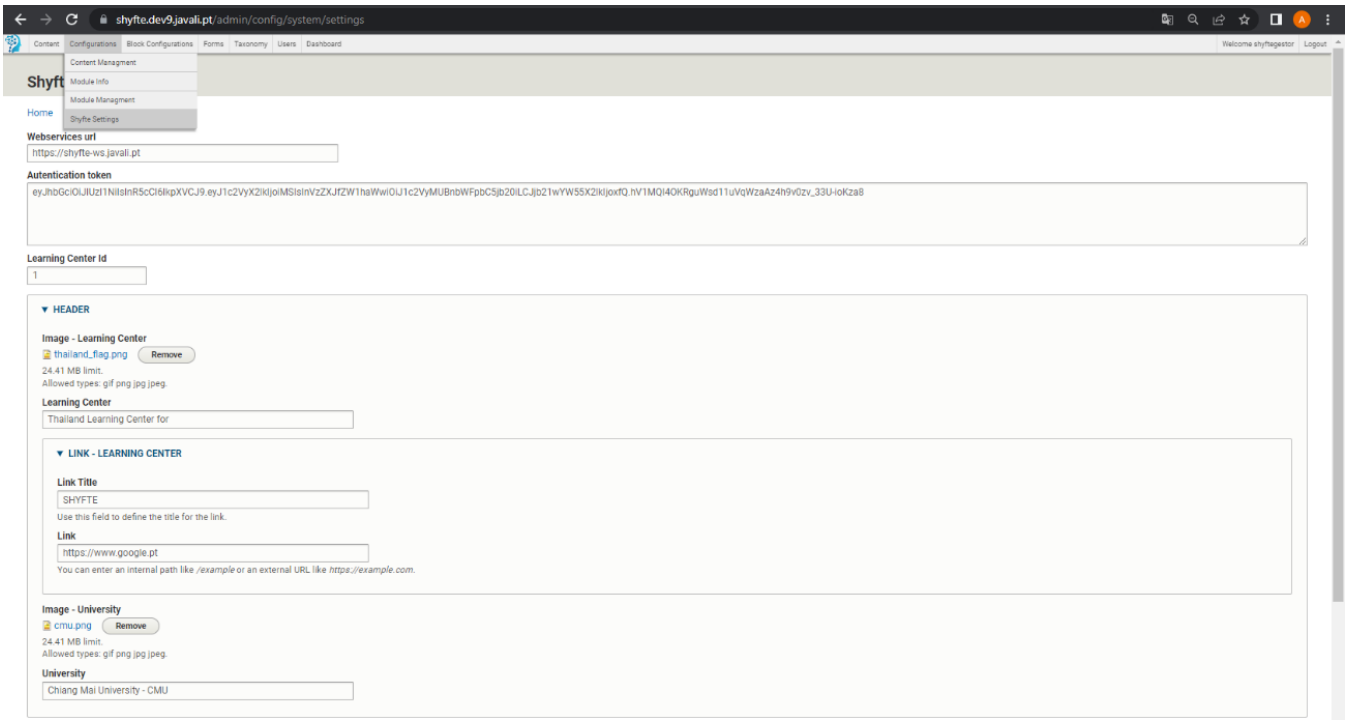

Figure 74 – Updating the authentication.

6. Conclusion

The application developed is a set of university contents about technology and aims to give the right knowledge to individuals and organizations. It isn't just a place with some data gathered about courses of a university with no extra piece of information to help the user. It is designed to generate the right path for a user to take towards it specific goal.

The way it works is that it lets the users answer questions about their purpose and what they want to achieve. The users can specify what kind of domain they are interested in and after that what kind of goal they are really searching for. Doesn't matter if it is a specific job, or a competence of a job, or even just a particular skill set they need.

This application does not want the users to say what course they want to take because it is not about courses already specified in university pages, it is about specific knowledge and focused to users individually. After the users tell the application what they really want to achieve, the application generates a training program with specific modules that meet their needs and attend the goal specified previously by them.

It also fits the needs of organizations that want to advance their knowledge in these themes. An organization can say in what area they want to advance and what level they think they are, after that they just need to tell the application what level they want to achieve. Then a training program is generated with the right path to meet the needs of the organization, no more, no less. It also lets organizations divide work by assigning who takes each module.

The application doesn't just allow to create training programs, it allows to manage and keep track of the path after that. Update the content inside the application, managing the status of each module, forms for help and feedbacks, statistics and more, all inside the same platform.

http://www.shyfte.eu/