Characteristics of the application solution, in SaaS (software as a service) mode, aimed at the acquisition of a Customer Relationship Management Platform for the management of applications from international students - Global Engagement Office of the University of Padova.

C.I.G. Code:

**TECHNICAL SPECIFICATIONS**

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<td>Administrative Procedure Manager</td>
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<td>Single Project Manager</td>
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<td>DCE</td>
<td>Director of Contract Execution</td>
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<td>API</td>
<td>Application Programming Interface</td>
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<td>BD</td>
<td>Bachelor Degree</td>
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<tr>
<td>CRM</td>
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<td>SLA</td>
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</table>

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1 Background

The Strategic Guidelines of the University of Padova 2016-2020 and the Integrated Performance Plan (2019 - 2021 and 2020 - 2022) identify among the University's strategic objectives the "Making study and PhD courses open and international learning environments", an objective that can be measured by taking as a reference the "Proportion of students enrolled in the first year (B, M, MSU) who have obtained their admission qualification abroad.

In order to achieve this objective, it is necessary to acquire a Customer Relationship Management (CRM) platform that will enable the combined structuring and management of both international promotion activities and international student admission processes.

In this sense, the platform is expected to be used by the staff of the Global Engagement Office (about 15 operators) and by the teaching and technical-administrative staff of the various departments of the University (about 250 operators).

The main platforms in use at the University, with related data, are:

- **ESSE3**: ESSE3 (Student Services and Secretariat) is the management software for the University's student secretariats developed by CINECA. The data managed by this platform are those relating to student careers. Integration with this management system is necessary for the CRM which is the subject of this document. The platform is currently on-premise but will migrate to a hosted supplier between 2021 and 2022.

- **Qlik**: is the business intelligence platform used by the University for data analysis and the development of management dashboards for governance. The management platform that is the subject of this document must allow access to its database so that the University can carry out analyses on the data contained in it (which are
considered the property of the University) and, on the same, can develop management dashboards.

Finally, the following is a list, by way of example but not limited to, of the infrastructures and basic services provided by the Computer and Telematic Services Area of this University with which the contractor may necessarily have to interact for the development and integration of the CRM:

- data and voice network, security;
- Identity & Access Management, directory service management, centralised authentication system;
- physical and virtual server platforms, storage and backup;
- database platforms, application servers and web servers;
- help desk system.

The architectures of the information systems managed by the University are almost all on 3 server levels:

1. reverse proxy
2. web server/application server
3. database server (mainly Oracle Database Server)

The operating system of the virtual machines built with VMware is mainly Linux (Red Hat, Debian, Ubuntu).

The applications developed by the IT and Telematics Services Area of the University for the Administration and the departments are based on the Oracle APEX and PHP Zend frameworks, and the GitLab Community Edition and Swagger systems are also used.

2 Subject matter of the contract

The Contractor shall therefore:
1. demonstrate that the solution is fully consolidated and implemented (in production) in at least five Italian state university institutions, in order to guarantee expertise in the field, completeness and scalability of the platform, adequate pool of users served and adequate maturity of the product;

2. provide a solution that meets the requirements dictated by the University;

3. provide the software licences necessary for the implemented solution;

4. provide detailed documentation of the platform and UML diagrams representing at least the use cases;

5. provide detailed manuals for users (both system administrators/managers and end users);

6. where the proposed software solution includes the acquisition of additional ancillary software by way of licence for a fixed or indefinite period of time, provide the necessary software licences and include their price in the overall cost of the bid submitted;

7. have designed and developed the system in accordance with standards and best practices in terms of software engineering and access and information security;

8. transfer the skills to the various actors through on-the-job training;

9. guarantee the corrective, regulatory and evolutionary maintenance of the infrastructure remotely for the entire duration of the contract in compliance with the SLAs defined by the client.

3 Functional requirements

The service must be aimed at three types of users: students, advisors, back office operators (admin).
For ease of reading, we divide the technical functional requirements into frontend experience (FE) that is, what must be visible to the student and backend (BE) that which must be visible to back office operators.

**Front End**

The student in the homepage of the platform must have at his disposal a flexible search engine that enables the search of courses. The search should not only be linked to the name of the course but should also find and present matches on the basis of the data characterising the course (course level, language of instruction, academic year of reference, etc.).

It must be possible to search and view courses through filters. The FE shall highlight the University's news. These news will be inserted by backoffice operators.

The student must be able to enter the private area or register for the first time at any time. The same function must always be visible when browsing the platform. Similarly, other types of users (administrators and recruitment agencies) must also be able to log in. For students only, it should be noted that being registered must be a necessary condition for applying for a course.

On the first visit to the platform the student must be asked for citizenship. Depending on the choice, the contents must change. A non-exhaustive example could be the request for a certificate of knowledge of the Italian language, which is compulsory for non-EU countries and not compulsory for EU countries.
Back End

The BE has to set up functions made available to backoffice users, listed below:

- A dashboard showing some metrics related to the progress of the processes embedded in the platform. By way of example, the dashboard must show the trend in the number of applications, the origin of applicants submitting applications, the positioning of applications in the various stages of the admission process.

- A section dedicated to reporting must enable the consultation and, on occasion, the extraction in spreadsheet format of data relating to candidates and to the performance of processes hinged on the platform. By way of example, this section must include data relating to the performance of the various marketing actions already carried out, trends in the number of users registering on the platform, changes applied by students to applications and the number of documents uploaded onto the platform. It must also include data on the performance of applications and the relative stages of the process in which they are placed. This data must be organised according to the origin of the students and according to the course of study. Filters (e.g. academic year of reference) must be provided to allow flexible consultation of the data available in this section.

- Applications: it must be possible to set up forms that can be customised using templates that must then be associated with a given course. When consulting an application already sent, the platform must make it possible to see all the candidate's data, any attachments and/or a score assigned to the candidate that is useful for positioning him/her in the admission ranking for the course for which he/she has applied. It must be possible to search for applications by individual status and after opening an application to see all the data, any attachments and also the score. In order to ensure efficient management of applications, the following functions must also be provided:
  a. logbook of all events occurring in CRM.
b. search and display of all users and related applications organised according to the different stages of the process.

c. positioning of candidates by course and by decreasing score, useful when there are rankings (courses with a programmed number of students) and/or when there are financial benefits to be awarded.

d. candidates' applications must be made up of "steps/stages". When the student fills in the application he/she must complete all the necessary steps. Each step is composed of a description, solutions to be answered, attachments to be uploaded in compulsory or non-compulsory form. It must be possible to see, in this section, the reports per step both in percentage and in number in order to understand how many candidates belonging to a template are stopped in a given step belonging to it.

e. advanced reporting where the individual backoffice user must be able to create personal views by creating filters and choosing the visible data with the possibility of saving the template and sharing it and making it available to other users with the same role.

- it must be possible to define the scoring ranges for each application template and the association with the related score. It shall be possible to set the range (min, max) for the score.
- it must be possible to display the ranking lists of candidates, sorted by course.
- interviews, as part of the submission of certain applications, candidates may be asked to carry out interviews; it must be possible to consult the various interviews carried out by the candidates. The interview is made of steps defined in a template a priori by the backoffice which must be associated to a course/template.

- Marketing functionalities:
a. It must be possible to create a unique alphanumeric identification code (assigned to certain applications) used to monitor the progress of marketing activities.

b. Recruitment agencies:
The University also uses recruitment agencies for which a parallel access to the platform must be set up to import candidates recruited by the agency. It must be possible to create the profile of each agency, which is composed of Name and Surname, agency identification code, e-mail address, access password to see the progress of applications associated with them. The agencies, by accessing the platform, will then see the information relating to the applications bearing their unique code.

c. The basic data of all applicants (name, surname, email address, registration date) must be reported. These data can also be sorted according to the status of the application.

d. It must be possible to assign unique codes according to the entry points (e.g. if the user is redirected from the university website or from a particular social network, etc).

e. When submitting the application, the candidate must indicate the tool with which he/she became aware of the University of Padova (e.g. recommended by a friend, internet page, etc.) and according to the choice a tag is automatically assigned.

- visualization of payment trends by instruments and integration of a payment gateway. The CRM shall be integrated with the PagoAtenei payment system as defined in Chapter 5 - Integrations and APIs.

- settings of all the operating content of the candidate selection process including:
  - uploading of data relating to the University facilities that provide the courses;
uploading data relating to study courses (e.g. name, level, language of instruction, duration, description, etc.);
uploading data relating to calls for admission (name, dates, etc.);
uploading data relating to the academic years to which the calls for admission refer;
setting up the fields and contents of the application form;
setting up the amount of contributions to be paid by candidates as part of the selection process.

import function:

a. Import candidates: import of excel file with layout consisting of name, surname, e-mail address. When importing, an e-mail must be sent to the candidate with the registration codes to complete the application. The imported files must be able to be associated with a unique code (used for marketing analysis, a non-exhaustive example would be uploading a file with candidate data obtained during a trade fair. The code would be used to find applications related to the fair or even for an agency to find applications with its own code).

content editing: the possibility of inserting and editing the dynamic content of the FE such as news, calendar and useful links must be given.

automations, define the various templates and behaviours that the CRM has to assume.

a. possibility to define template settings composed of the steps the applicant has to take to complete the application.

b. configuration of the fees to be paid to the University of Padova during the application phase.

c. definition of rules which, at precise moments in the process, generate an automatism.
d. definition of the models and documents that must be sent automatically at the end of a given step.

- general settings:
  a) general data on the University (url, etc.);
  b) management of administrator profiles;
  c) setting automatic communications;
  d) setting and customising the different states through which an application must pass within the selection process;
  e) API;

Integration for the export of data from the platform to the applications used by the University and support activities for the initial configuration of the system shall be carried out by the supplier on the basis of the indications and parameters defined by the University.

4 Non-functional requirements

The Contractor shall declare and guarantee the certified compatibility of the applications with the most widely used browsers and operating systems (FireFox, Chrome, Internet Explorer, Windows), guaranteeing the updating of subsequent developments.

The interface shall:

- be "responsive", i.e. the layout and interface must adapt to the device used to access the services;
- be available for all mobile platforms (smartphones and tablets with Android and iOS operating systems);
- be available in English (default), with user/operator choice.
All the applications shall be made available in Software as Service (SaaS) mode and shall not require the installation of SW components at the Customer's datacentres. This SaaS service must be qualified by AgID and published on the PA Cloud Marketplace. The solution must guarantee compliance with the Minimum Measures for the IT security of the PA defined by the Agenzia per l'Italia Digitale - AgID circular, 18 April 2017, no. 27 (https://www.gazzettaufficiale.it/eli/id/2017/05/05/17A03060/sg), and be equipped with IT security certifications (i.e. ISO 27001). These requirements must be met when the service is released and put into production, otherwise the contract will be terminated. In particular, the awarding of the contract is oriented towards the SaaS model so as to make it possible to launch purchasing initiatives in a short time and to maintain organisational flexibility within the University, leaving the management of application and system management services, user training and operational assistance entirely to the Contractor.

4.1 Business continuity and disaster recovery

As a general rule, the application services covered by the contract must all be active and usable 24 hours a day, 7 days a week, including holidays.

The uptime percentage of the application services, calculated on an annual basis and on all and only the services released in production, must not be less than 99.50%; any breach of this SLA shall entail the application of penalties.

For the purposes of determining the % of uptime of the application services, the following cases shall NOT be taken into account in the calculation:

- Interruption due to scheduled maintenance operations, even if carried out in compliance with what is specified below;

Scheduled maintenance interventions shall:

- Be notified to the University at least 15 working days in advance;
• Have a duration, per single intervention, of no more than 6 hours;
• Have a cumulative duration over the month of no more than 10 hours;
• Have a cumulative duration over the year of no more than 48 hours;
• Be carried out at night (between 00.00 and 07.00);

Scheduled maintenance operations that violate at least one of the above thresholds shall be included among the unavailability in the calculation of the % uptime of the services.

In the event of any faults affecting the continuity of the application services, the Contractor shall guarantee their recovery in compliance with the following SLAs:
• RTO (Recovery Time Objective) of the application services = 8 working hours
• RPO (Recovery Point Objective) of the application services = 4 hours.

Every six months, within 10 working days from the end of the six-month period, the Contractor shall produce a report on the times when the services are not available. This report shall be validated by the Customer on the basis of the evidence in its possession and shall constitute the reference for the determination of any penalties.

4.2 Accessibility

The right of accessibility to the Computer System by disabled and disadvantaged persons must be guaranteed, as enshrined in Italian legislation. Law 04/2004 defines accessibility as the ability of information systems, in the forms and within the limits allowed by technological knowledge, to provide services and information usable, without discrimination, even by those who, due to disabilities, require assisted technologies or special configurations;

The 12 accessibility requirements for websites in current legislation are:
- Requirement 1 - Textual alternatives: provide textual alternatives for any non-textual content so that the text provided as an alternative can be used and transformed according to the users' needs, for instance converted to large print, Braille print, read by a speech synthesis, symbols or other content representation modality.

- Requirement 2 - Audio content, video content, animations: provide equivalent textual alternatives for information conveyed by audio formats, video formats, formats containing animated images (animations), multisensory formats in general.

- Requirement 3 - Adaptable: Create content that can be presented in different ways (e.g. with simpler layouts) without loss of information or structure.

- Requirement 4 - Distinguishable: make it easier for users to see and hear the content, separating foreground content from background.

- Requirement 5 - Keyboard accessibility: make all functions available via the keyboard.

- Requirement 6 - Adequate time availability: provide users with sufficient time to read and use the contents.

- Requirement 7 - Epileptic seizures: do not develop contents that may cause epileptic seizures.

- Requirement 8 - Navigable: provide the user with support functions to navigate, find content and determine their position in the site and pages.

- Requirement 9 - Readable: render the textual content readable and comprehensible.

- Requirement 10 - Predictable: create web pages that appear and behave in a predictable manner.

- Requirement 11 - Assistance in entering data and information: Helping the user to avoid errors and facilitating their correction.

- Requirement 12 - Compatible: Ensure maximum compatibility with user programmes and assisted technologies.
4.3 Customisation

The Contractor shall allow the necessary parameterisations and customisations in relation to the University’s requirements, such as the graphic layout, the nomenclature used in the web pages, etc. The customisations shall not be included in the evolutionary maintenance envisaged in the previous paragraph and shall be excluded from the fee for evolutionary maintenance.

5 Integrations and APIs

The Management System must be able to integrate with other systems and applications developed by the University or by third parties. All the components must be able to interface from a technological point of view, using recognised and open standards, and must be able to exchange information with other management systems. In particular, the software shall:

- Display a public catalogue of Application Program Interfaces (APIs) to ensure interoperability with third party systems;
- Guarantee integration and interoperability with the application system for student career management Esse3 didactics developed by Cineca and adopted by the University, chapter 5.1 - ESSE3 integration.
- Guarantee integration and interoperability with the application system for the management of payments for PPAA - PagoPA. In particular, the management system shall be integrated with PagoAtenei. If, at the date of the awarding of the contract, the management system does not comply with the integration with PagoAtenei, the University of Padova shall provide the specifications for the integration with a middleware, developed in-house, to facilitate the connection with PagoPA. It should be noted that the entire integration shall be borne by the supplier and shall be carried out in a maximum of 10 working days starting from the date of assignment. In the event of delays in the delivery/realisation of the integration, the University reserves
the right to apply the relevant penalties and to take all the necessary steps and actions to claim damages.

- Integration with the SMARTHUB keystone portal - all those who sign up for MasterStudies are brought into the CRM via API). The licence for keystone accesses are paid for by the University and should not be counted as included in the fee.

5.1 Integration with ESSE3

The integration between CRM and ESSE3 consists of the migration of international applicants’ data to coordinate the Admission (in CRM) and Matriculation (in ESSE3) process at the University. Applications must be able to be managed in different states, which can be configured ad hoc. For each application status, the University must be able to decide, each time, which data to migrate and which subsequent operations to carry out (e.g. migrate only the personal data or also create a matriculation application). If the candidate, once enrolled in ESSE3, has to modify his information in Cineca, it will not be necessary to provide for realignment in CRM.

The CRM will have to invoke specific ESSE3 services only in the part of the flow related to the assignment of the SSO account to the candidate, which will be explained later.

The migration of information from CRM to ESSE3 must be able to take place automatically and continuously, asynchronously, or by procedures launched manually by an operator at predefined times, e.g. at the end of different activated calls. The import must be able to be launched separately per academic year of applications.

The steps of the current flow are outlined below:

1. the applicant enters and confirms the application in the CRM, paying the expected fee via PagoPA;
2. the application is evaluated positively or negatively by the relevant Office or Commission; the status of the application is then changed in CRM according to the outcome (see statuses in the table below);

3. if the assessment is positive, the candidate accepts the position by paying the first instalment in CRM via PagoPA; the application is passed to a different status, which is now labelled "Ready for enrolment";

4. ESSE3 invokes CRM services to import student data and, for the "Ready for enrollment" applicant, it calculates the tax code, creates the personal data and the SSO account (initially disabled), stores the course to which the application refers in the "prior application" function, imports the application attachments and creates the enrolment application;

5. the CRM invokes a specific Esse3 service (see API exposed) to obtain the token linked to the personal data (which is reconnected through the application id); the token must be concatenated with a string to create the url which allows the candidate to access the ESSE3 private web area authenticating only in CRM and bypassing, at this stage, the SSO authentication.

6. the operator decides when to send the email containing the token link via CRM. The text of the email must be the same for all and defined by the Global Engagement Office.

It is specified that:
   a. it must be possible to vary the coding of the application statuses, both in number and in the labels; in any case, the current flows and linked statuses are attached, for both open and programmed access courses;
   b. for each application status the University must be able to decide, from time to time, which data to import and which operations to carry out subsequently in ESSE3, as requirements may change over time.
Below is the table with the ESSE3 fields that must be guaranteed in CRM for the correct mapping with Cineca:

<table>
<thead>
<tr>
<th><strong>ESSE3 – registration fields</strong></th>
<th><strong>Format</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST NAME</td>
<td>C(80)</td>
</tr>
<tr>
<td>SURNAME</td>
<td>C(80)</td>
</tr>
<tr>
<td>DATE OF BIRTH</td>
<td>Date format (YYYYMMDD)</td>
</tr>
<tr>
<td>GENDER</td>
<td>C(1)</td>
</tr>
<tr>
<td>NATIONALITY</td>
<td>C(2)</td>
</tr>
<tr>
<td>Citizenship2</td>
<td>C(2)</td>
</tr>
<tr>
<td>COUNTRY (of birth)</td>
<td>C(2)</td>
</tr>
<tr>
<td>CITY OF BIRTH</td>
<td>C(80)</td>
</tr>
<tr>
<td>Mother Tongue Language</td>
<td>C(3)</td>
</tr>
<tr>
<td><strong>Address (of residence)</strong></td>
<td></td>
</tr>
<tr>
<td>COUNTRY</td>
<td>C(2)</td>
</tr>
<tr>
<td>PROVINCE</td>
<td></td>
</tr>
<tr>
<td>CITY</td>
<td>C(80)</td>
</tr>
<tr>
<td>ZIP CODE</td>
<td>C(10)</td>
</tr>
<tr>
<td>ADDRESS</td>
<td>C(80)</td>
</tr>
<tr>
<td><strong>Contacts</strong></td>
<td></td>
</tr>
<tr>
<td>EMAIL</td>
<td>C(100)</td>
</tr>
<tr>
<td>MOBILE PHONE</td>
<td>C(17)</td>
</tr>
<tr>
<td>Telephone</td>
<td>C(20)</td>
</tr>
<tr>
<td><strong>Identity Document</strong></td>
<td></td>
</tr>
<tr>
<td>Photo</td>
<td></td>
</tr>
<tr>
<td>CI-Identity card</td>
<td>C(3)</td>
</tr>
<tr>
<td>PAT- Driving license</td>
<td></td>
</tr>
<tr>
<td>PAS-Passport</td>
<td></td>
</tr>
<tr>
<td>Passport ID Number</td>
<td>C(30)</td>
</tr>
<tr>
<td>Issue Date</td>
<td>Date format (YYYYMMDD)</td>
</tr>
<tr>
<td>Expiry Date</td>
<td>Date format (YYYYMMDD)</td>
</tr>
<tr>
<td>Identity Card Number</td>
<td>C(30)</td>
</tr>
<tr>
<td><strong>Profiling</strong></td>
<td></td>
</tr>
<tr>
<td>CRM Token Applicant ID</td>
<td></td>
</tr>
<tr>
<td>Registration Date</td>
<td>Date format (YYYYMMDD)</td>
</tr>
<tr>
<td>Course of Study+Course plan +curriculum</td>
<td>C(10)</td>
</tr>
<tr>
<td>Academic Year</td>
<td>N(4)</td>
</tr>
<tr>
<td>Category (EU- non EU)</td>
<td></td>
</tr>
</tbody>
</table>
The table below shows the statuses and related behaviours associated with ESSE3 and CRM, currently in use at the University:

<table>
<thead>
<tr>
<th>Status application</th>
<th>Detail</th>
<th>Esse3</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unreplied</td>
<td>Application SUBMITTED and waiting to be taken over by A&amp;W</td>
<td>PERSON Registration (master data) automatically updated every 24 hours, associated with the data of the degree programme with the outcome “in evaluation”.</td>
<td>the candidate may choose up to three study programmes, with priority given to their choice</td>
</tr>
<tr>
<td>Feedback</td>
<td>Incomplete application: the applicant has been asked to provide additional information.</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Requirements not fulfilled</td>
<td>Candidate’s qualification does not allow access to bachelor or master courses in Italy or documentation incomplete at the end of the call</td>
<td>PERSON Registration (personal data) automatically updated every 24 hours, associated to the data of the student with the result of the application assessment “rejected”.</td>
<td>/</td>
</tr>
<tr>
<td>Ready for academic check</td>
<td>Application sent by A&amp;W to the Department for academic evaluation</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Ready for GEO</td>
<td>Application evaluated by the Department and waiting for A&amp;W to communicate to the applicant the result of the Department evaluation</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>Academically Eligible</td>
<td>(ONLY FOR PROGRAMMED CDS): Application evaluated positively by the Department and waiting for the publication of the rankings</td>
<td>PERSON Registration (personal data) automatically updated every 24 hours, associated with the data of the school with the result “suitable” (not yet admitted, only has the requirements)</td>
<td>Only for planned access courses, intermediate status pending publication of the ranking list</td>
</tr>
<tr>
<td>Failed</td>
<td>Application evaluated negatively by the Department</td>
<td>PERSON Registration (personal data) automatically updated every 24 hours, associated with the data of the degree programme with the result of the application assessment “rejected”.</td>
<td>/</td>
</tr>
<tr>
<td>Conditional Offer</td>
<td>Applicant evaluated positively by the Department: sent request for acceptance of the offer (conditional on obtaining the qualification or language requirement) and payment of the first instalment</td>
<td>PERSON Registration (personal data) automatically updated every 24 hours, associated with the data of the degree programme with the result of the application assessment “eligible under condition”.</td>
<td>The student can only complete the enrolment process once the missing requirements have been met (=access qualification / language requirement).</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Full Offer</td>
<td>Applicant evaluated positively by the Department: sent request for acceptance of the offer and payment of the first instalment</td>
<td>PERSON registration (personal data) automatically updated every 24 hours, associated with the data of the degree programme with the result of the application assessment “admitted”.</td>
<td>/</td>
</tr>
<tr>
<td>Offer accepted</td>
<td>Offer accepted by the candidate by payment of the first instalment</td>
<td>/</td>
<td>Manual upload of the first instalment payment by the Global Engagement Office staff</td>
</tr>
<tr>
<td>Ready for enrolment</td>
<td>Candidates who have already received Admission Letter</td>
<td>PERSON Registration (personal data) automatically updated every 24 hours by taking data from the Journal and associated to the Degree Programme + enrolment already pre-completed</td>
<td>Candidate receives in DA a message with a token to access Esse3. Enters Esse3, changes the pw and finds the matriculation application already pre-completed.</td>
</tr>
<tr>
<td>Arrived and enrolled</td>
<td>Enrolment completed</td>
<td>PERSON Registration (personal data) automatically updated every 24 hours, associated with the data of the degree programme with the result of the application assessment “admitted” + matriculation in hypothesis</td>
<td>Attachments will have to be added (automatic download from DA to Esse3)</td>
</tr>
<tr>
<td>Withdrawn</td>
<td>Application withdrawn</td>
<td>PERSON registration (personal data) automatically updated every 24 hours, associated with the data of the degree programme with the result of the application assessment “admitted” + matriculation closed by mistake</td>
<td>/</td>
</tr>
</tbody>
</table>
The platform uses endpoints exposed by the ESSE3 Rest API Library/anagrafica-service-v2/activation-url to generate the Activation token mentioned above.

In addition the CRM shall provide APIs for proper communication with ESSE3 in particular:

- `/api/journal`

This is an important API call because it allows ESSE3 to extract events related to the application from the CRM. To know if there have been any new events it is sufficient to query this API call regularly, saving the loggedtimestamp or incremental ID of the last request each time. For subsequent requests, use the timestamp or ID stored for the `bySince` parameter. For example, if your last event processed was 123 (as in the following example), your next call could be `?bySince=124`, to return rows starting at 124 (This will skip all events up to and including 123).

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>byEvents</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>List of logbook events you are interested in.</td>
</tr>
<tr>
<td>bySince</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>An ISO datetime or the (sequential) ID from which you wish to start the search.</td>
</tr>
</tbody>
</table>
byUntil | Optional | An ISO datet ime or the (sequential) ID of the last also that you wish to receive.
byAcademicYear | Optional | The academic year to filter by.
byAcademicTermID | Optional |
Order | Optional | Specify the order in which the results are returned. Legal values are 'newest-first' and 'oldest-first' (default). If an invalid value is provided, the default value will be applied.
Limit | Optional | How many logbook events to return (the allowed range is normally 1..1024, 1024 is the default). If expand is used, the limit is 512. If the limit is exceeded, it is automatically blocked.
Expand | Optional | Expand the chosen relational elements, e.g. applicant,offer.

- /api/applicants

Lists the candidates using the filters set as parameters. The number of candidates is represented X-Count in the header:

- uses the HEAD request to simply count the number of candidates matching the filters.
- uses the GET request to actually retrieve them.

There is a hard limit of 16384 elements returned, which is limited to 512 if expand is used as a parameter.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bySince</td>
<td>Optional</td>
</tr>
<tr>
<td>byCitizenships</td>
<td>Optional</td>
</tr>
<tr>
<td>byEmails</td>
<td>Optional</td>
</tr>
<tr>
<td>byTrackerIDs</td>
<td>Optional</td>
</tr>
<tr>
<td>byTrackerCodes</td>
<td>Optional</td>
</tr>
</tbody>
</table>
Limit: Optional
How many candidates to return (the allowed range is normally 1..16384, 16384 is the default). If expand is used as a parameter the limit is 512.

Expand: Optional
Expand the chosen relational elements, e.g. applicant,offer.

/api/applications
Retrieves a list of applications that match the set filtering criteria. There is a hard limit of 16384 items returned, which is limited to 512 if "expand" is used as a parameter.

Name | Description
--- | ---
byAcademicTermID | Optional
AcademicTermID by which to filter.
byAcademicYear | Obligatory
The academic year to filter by.
byAcademicYears | Optional
The academic years to filter by.
byApplicantIDs | Optional
List of candidate IDs. An application will match if it belongs to one of the listed candidates.
byStatuses | Optional
List of application statuses.
byCreatedSince | Optional
Date/time ISO 8601. Only shows questions created after this date.
byRevisedSince | Optional
Date/Time ISO 8601. Only shows questions revised after this date.
bySubmittedSince | Optional
Date / Time ISO 8601. Only shows questions submitted after this date.
byCourseIDs | Optional
List of Course IDs. An application will match if it contains at least one of the listed courses.
byCourseTypes | Optional
List of Course Types. An application will match if it contains at least one course of the listed types.
byCourseInstitutionIDs | Optional
List of institution IDs. An application will match if it contains at least one course from the listed institutions.
• /api/courses

Lists the courses using the filters set as parameters. The number of courses is represented "X-Count" in the header:

- Use the HEAD request to simply count the number of courses that match the filters.
- Use the GET request to actually retrieve them.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>byStatuses</td>
<td>Optional List of statuses, currently limited to: &quot;Online&quot;, &quot;Standby&quot;, &quot;Draft&quot;, &quot;Archived&quot;, &quot;Template&quot;, &quot;Closed&quot;.</td>
</tr>
<tr>
<td>byTypes</td>
<td>Optional List of course types.</td>
</tr>
<tr>
<td>byModes</td>
<td>Optional List of course Modes.</td>
</tr>
</tbody>
</table>

• /api/academic-terms
It lists the academic "terms" configured in the system. These are the main "buckets" in which applications are classified. An example of an academic term is "Fall 2016" or "Spring 2017". A response of the following type is returned:

```
{
  "1": {
    "year": "/api/academic-years/2016"
    "name": "Autumn semester"
  },
  "2": {
    "year": "/api/academic-years/2016"
    "name": "Autumn semester"
  }
}
```

6 Security, privacy and data processing

The Contractor shall:

- ensure high standards of security;
- ensure that data processing is carried out in accordance with European privacy legislation (GDPR).

In this regard, the Contractor must have designed and developed the platform in accordance with the best practices in terms of web development (e.g. it must have adopted application frameworks that robustly manage protection against attacks of various types such as CSRF, XSS, injection, etc.) and provide the functions via secure HTTPS connections to guarantee the encryption of communication.

The Contractor is obliged to maintain the confidentiality of the data and information of which he becomes aware during the performance of the contract, not to disclose them in any way or form and not to use them for any purpose other than those strictly necessary for the performance of the contract.
At the end of the contract, when the databases of the information system are handed over, the data held by the Contractor shall be permanently deleted.

The Contractor shall be responsible for ensuring that his employees, consultants and collaborators, as well as subcontractors and their employees, consultants and collaborators, comply with the above obligations.

Within 15 (fifteen) days of the start of work, the Contractor shall send the Administration the name of the person responsible for the processing of personal data, who shall guarantee compliance with Legislative Decree 196/2003 and subsequent amendments and additions and with the GDPR. The personal data acquired as a result of the contractual relationship arising from this tender shall be processed solely and exclusively for all purposes connected with the performance of the service.

The Contractor, in the person of the company's personal data controller, undertakes to provide the office of the person in charge of the procedure relating to this contract with a declaration regarding compliance with the provisions of the Personal Data Protection Code.

In the event of non-compliance with the obligations of confidentiality, the entity shall have the right to declare the contract rescinded by law, it being understood that the Contractor shall be required to pay compensation for any damage caused.

The ownership of all the information managed, handled and processed in the performance of the operations provided for in these specifications shall remain with the University.
The possibility must be guaranteed at all times of recovering in an exhaustive and complete manner (and at no additional cost) the information assets, which are the exclusive property of the entity, stored in the service database, in accordance with formats, times and procedures documented in detail and agreed upon with the SPM/DCE.

The information assets in their full meaning must be available at all times for the entire duration of the contract and must be accompanied by an exhaustive description of the data and metadata (by way of explanation, in addition to the data dump, the relational schema, the views, the descriptions of the fields containing the data, any stored procedures) within 10 (ten) working days of the formal request.

The Data Centre of the winner of the tender in which are located:

- the servers used for the provision of the contractual services
- the data collected and processed as part of the provision of the services
- the backup and disaster recovery sites

must be located exclusively within the territory of the European Union.

7 Support

The Contractor shall provide the University with a technical contact for the contract to obtain appropriate support and/or a ticketing system. All reports shall be of the "malfunctioning" type and shall be classified according to priority as follows:

- priority 0: the entire system is unavailable to users and operations are completely blocked;
priority 1: a critical functionality of the system (i.e. with immediate expiry and not replaceable by other functionalities or workarounds) is unavailable to users (or presents serious malfunctions) and the corresponding operativity is blocked;

- priority 2: a non-critical functionality of the system (i.e. without immediate expiry or substitutable with other functionalities or workarounds) is unavailable to users or presents serious malfunctions;

- priority 3: a non-critical functionality of the system (i.e. with no immediate expiry date or that can be replaced by other functionalities or workarounds) has malfunctions that do not prevent operation;

For the assistance and maintenance services, the Contractor shall guarantee the following SLAs:

| Time for taking charge of malfunctioning type reports with priority 0 | 30 working minutes after insertion or telephone notification |
| Time for taking charge of malfunctioning type alerts with priority 1 | 1 working hour after insertion or telephone notification |
| Time of dealing with malfunctioning type of alerts with priority 2 | 4 working hours after insertion |
| Time for taking charge of malfunctioning type notifications with priority 3 | 8 working hours after insertion |
| Time to restore full service for priority 0 malfunctions | 4 working hours after taking charge |
| Recovery time of full service for priority 1 malfunctions | 8 working hours after taking charge |
| Time to return to full service for priority 2 malfunctions | 24 hours after taking charge |
Time to return to full service for priority 3 malfunctions | 48 working hours after taking charge

The following must also be made available and communicated at the start of the services:

- an active telephone line during office hours (Monday-Friday 8.30-12.30 - 13.30-17.30) that can be used for:
  - high priority (0 or 1) "malfunctioning" reports
  - unavailability of the ticketing system
  - in-depth analyses in relation to requests for evolutionary maintenance
- a functional e-mail address to which requests and reports can be sent in case of unavailability of the ticketing system.

Notification of the problem to the Contractor’s referent may be made by telephone, by email or by opening a support ticket on the support system made available by the Contractor.

The support service shall be available from 08.30 to 17.30 Monday to Friday.

On the basis of the elements collected, the assistance service shall establish with filtering action, within the timescales defined above, the ways in which the solution to the problem reported may be pursued:

- by directly providing information on the solution;
- communicating the presence of patches, workarounds or resolution through ordinary maintenance actions and, possibly, by distributing new releases;
- directly providing telephone assistance (1st level assistance) to users in solving problems of a more operational nature.

Working hours are understood to be from 8.30 a.m. to 5.30 p.m. on each working day.
8 Maintenance

Maintenance is divided into:

- technical / corrective;
- regulatory
- evolutionary

The objective of the technical/corrective maintenance service is to resolve problems relating to errors or malfunctions at application level. The service shall provide for:

- the ordinary management of the resources, hardware and software, necessary for the correct functioning of the platform;
- activities aimed at guaranteeing the correct functioning of the system and monitoring alarms deriving from excessive workload, malfunctioning of hardware or software components, breach of system security;
- assuming responsibility for all the consequences that may arise from any anomaly and/or blockage of the system, attributable to the Contractor;
- the planning, execution and control of data saving and copying operations, reorganisation of the database, and all other periodic operations required by the application system;
- saving and storing the logs/documents of the system's activity;
- in the event of a platform blockage, the restoration of the complete functionality of the system, both in terms of access and in terms of logical-physical integrity of the data, according to the service levels indicated below;
- corrective maintenance (through the removal of system errors that may occur during the course of the contract, in order to guarantee the maintenance of the operability and functionality of the software application) and adaptive maintenance (in order to ensure the constant, effective and timely updating and evolution of the functionality...
of the application software with respect to the requirements of the University and/or to regulatory changes that entail software modifications).

Regulatory maintenance includes maintenance activities aimed at ensuring the constant adherence of the functionalities of the service to the evolution of the regulatory context within which the service is inserted and provided, which may become necessary as a result of new legal provisions and/or government regulations for the application of the laws themselves. By way of example, but not exhaustively, changes to be made to the service are to be understood as regulatory adjustments:

- introduced by regulations and rules on data security and protection;
- as a result of the provision of interaction methods based on interoperability mechanisms with other PPAAAs for the reporting and communication of data and statistics obtained from the platform.

All regulatory compliance activities are to be considered already included in the cost of the service fee. Regulatory maintenance activities may also be carried out on the basis of explicit requests by the University through the communication channel to be agreed between the University and the contractor (ticketing system or email).

As a general rule, regulatory adjustments linked to national and European regulatory changes that have an impact on the service both from a technical point of view and in terms of the application context, are due without an explicit request from the University. The updating connected with the regulatory maintenance must take place within 30 calendar days from the University's request or within the improvement term declared in the technical offer and in any case before the regulations come into force.

For each new "request" for regulatory maintenance by the University, the contractor must:

- describe the functionality released together with detailed documentation;
- indicate the date and time of the end of the activities relating to the "request".
For each new "request" for evolutionary maintenance by the University, the contractor must also:

- provide the estimate in terms of man-hours needed to process the "request", to be submitted for validation by the University;
- provide an indication of the release timeframe.

The term **evolutionary maintenance** refers to the maintenance activity aimed at improving the functionality of the system in order to ensure an ever-increasing adherence of the procedures to the requirements of automation and integration with the surrounding information environment or which may become necessary as a result of regulatory changes within the University.

**Evolutionary maintenance** activities shall be carried out with respect to the software in operation, including the components that the contractor has modified or developed from scratch during the contractual period.

For the implementation of evolutionary maintenance activities that may arise during the term of the contract, the contractor must provide at least 100 hours for the entire contractual term. This activity shall be on a consumable basis and must be authorised by the SPM/DCE as set out below.

Requests for evolutionary maintenance must be accepted within 5 working days from the date of the request.

Within the following 10 working days the contractor shall analyse the request and reply to the University indicating:

- the modalities of intervention and the outline specifications for the realisation of the request;
• an estimate of the time required, expressed in man-hours, for the realisation of the request, also specifying the expected delivery date.

Acceptance of the proposal by the University shall be made formally by the SPM/DCE and shall follow the actual implementation which shall be completed by the expected delivery date proposed by the contractor. Rejection of a proposal by the University will result in the request being closed and not carried out.

Upon completion of the modifications, the University checks the operations carried out in order to validate their functionality. Any discrepancies detected shall be managed within the scope of corrective maintenance and any subsequent further development activities shall not result in a reduction of the man-hours available for the evolutionary maintenance service as they are intended as activities aimed at removing defects.

The approval of the changes by the University implies the acceptance of the modified service and follows the modification of the documentation (usage, management, procedural flows, structure of the underlying database) of the operating environment.

9 Location and timeframe of service

The Contractor shall:

1) Schedule with the Body's project manager the initial remote meetings;
2) Provide remote platform maintenance for the duration of the contract;
3) Be available to maintain platform documentation and update it whenever necessary;
4) Be available to manage the handover to ASIT personnel or personnel of another taking over Economic Operator at the customer's premises, within and after the end of the contract. Any failure to comply with this essential point will be considered an interruption of public service.
Following the initial meetings to share the project, the University reserves the right to propose or accept any delays in relation to the agreed delivery times. For all the services covered by this procedure, the parties shall agree on a time schedule (GANTT diagram) to be prepared by the parties, in compliance with the above time limits.

The date for putting the software into production may not be later than 01/09/2021. In the event of a delay in delivery, the University reserves the right to apply the relative penalties as well as to implement all the acts and actions for possible compensation for damages.

10 Platform testing

The system test methods shall be established in detail by the University following the drawing up of the time schedule referred to in article 10 of these specifications; by way of example and not limited to, the infrastructure and functional tests shall be included in the tests for compliance with the functional, non-functional and integration requirements defined in these specifications; the results of the tests shall be reported in the intermediate intervention reports relating to installations, configurations, etc.

In order for the University to be able to test any changes to the platform (whether they be bug fixes, evolutionary or perfective updates), the Contractor shall provide a special test environment. The test environment shall be fully integrated with the other test platforms relating to the systems mentioned in Art. 5 - Integrations and APIs. This environment shall be used for testing, prior to the release in production, the updates and new functionalities released during the performance of the contract. Tests must be able to be agreed, scheduled and carried out whenever necessary. The university must always have access to the test environment.
The test of the platform shall be repeated, by agreement between the Contractor and the University, if the test is negative for any reason that does not comply with the supply and the service requested and/or each time the platform is updated by the Contractor. In the event of a negative outcome of the tests and failure to resolve the malfunctions found, the University reserves the right to withdraw from the contract, to apply the relative penalties and to implement all the acts and actions for any compensation for damages.