

# Erasmus Without Paper Network getting ready for the new Erasmus+ Programme

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## Abstract

**EWP** (*Erasmus Without Paper*) project aims at creating free public infrastructure that facilitates electronic exchange of data on student mobility under the Erasmus+ Programme. The project has been co-financed in years 2015-2017 and 2018-2019 by the *Erasmus+ Programme, Key Action 3 (Prospective Initiatives — Forward Looking Cooperation Projects)* [1]. In years 2020-2022, EWP, together with other HE mobility digitization initiatives, will feed into the *European Digital Student Service Infrastructure* (EDSSI) project, funded under the CEF programme [2].

In 2020 the European Commission has declared that the EWP standards of electronic exchange of data on student mobility will gradually become mandatory from 2021 onwards. The detailed roadmap has been presented. This year EU announced new templates for the *Learning Agreement (LA)* and *Interinstitutional Agreement (IIA)* – the most important documents supporting student mobility under the Erasmus+ Programme. The EWP Registry, which is the discovery service in the EWP Network, lists over 1 300 registered institutions which declare handling mobility data in an electronic way<sup>†</sup> (April 2021). The network is growing, every week new institutions join. Mobility software providers validate their implementations in the development EWP network. Partner HEIs start exchanging mobility data, in test and production settings.

This is a real challenge for the EWP development team, responsible for the timely adaptation of the network infrastructure to the emerging needs and requirements.

The aim of this paper is to show how the EWP Network is getting ready for the new Erasmus+ Programme to be carried in years 2021-2027.

## 1 Introduction

The Erasmus Without Paper Network is an integrated communication network, supporting the exchange of student data in an electronic format [3], [4]. The network architecture, security protocols

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† <https://registry.erasmuswithoutpaper.eu/coverage>

and *Application Programming Interfaces* (APIs) supporting data transfer between *Student Information Systems* (SISs) of *Higher Education Institutions* (HEIs) are fully specified and publicly available in GitHub. The only central part of the EWP Network is the *Registry* which delivers the discovery service for the nodes in the network. The Registry updates its content automatically by periodically reading so called *manifest files* which are located at the nodes and contain information about connected institutions and implemented APIs. This information can then be obtained from the Registry via *Discovery Manifest API*.

## 2 Changes in API specifications

The data in the network is exchanged via APIs. Stable APIs are crucial for smooth delivery of services. However APIs should reflect real processes. New Erasmus+ Programme brings some important changes in the OnLine Learning Agreement for studies<sup>‡</sup> which should be included in the specification of the *Outgoing Mobility Learning Agreements API*<sup>§</sup>:

- New types of mobilities have been added to the existing *semester mobility: blended mobility with short-term physical mobility* and *short-term doctoral mobility*.
- *Virtual component* may be optionally added to the semester mobility and short-term doctoral mobility (it is mandatory for the blended mobility).
- *Automatic recognition* of study components has to be specified.
- *European Student Identifier* (ESI) is the mandatory attribute of a student.

On a technical level *Change Notification Requests* (CNRs) became mandatory to avoid too frequent scanning for changes and lower the traffic which might stop operation of nodes like On-line Learning Agreement platform (available at <https://www.learning-agreement.eu>), which supports a large number of HEIs.

Changes in *Interinstitutional Agreements*<sup>\*\*</sup> which have to be reflected in the *Interinstitutional Agreements API*<sup>††</sup> are the following:

- There is new option *blended mobility for students*.
- The EQF qualification level (i.e. the level of studies) may be indicated for internships.
- The annual number of mobilities becomes optional for part-time studies.
- Additional information is required (e.g. course catalogue, comment with important information about the agreement).

API Validators play an extremely important role in the development process. Development teams can check if their implementation conforms to the EWP specifications. The Validators are available in GitHub and described in the *Developers Guide*<sup>†††</sup>. They can be used either in a local environment or on-line from the Dev Registry Service in the Manifest Importer Status section. However they have to be updated along with the changes in APIs to cover also the new versions.

## 3 Information portal of the EWP Registry

The EWP Registry was initially designed as a strictly backend discovery service [5]. Soon it became obvious that some publicly available information about the connected institutions and

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<sup>‡</sup> <https://wiki.uni-foundation.eu/display/EWP/New+LA+template>

<sup>§</sup> <https://github.com/erasmus-without-paper/ewp-specs-api-omobility-las/tree/v0.5.0>

<sup>\*\*</sup> <https://wiki.uni-foundation.eu/display/EWP/New+IIA+template>

<sup>††</sup> <https://github.com/erasmus-without-paper/ewp-specs-api-iias/tree/v6.0.0>

<sup>†††</sup> <https://developers.erasmuswithoutpaper.eu/>

provided services is needed. A couple of pages with public information have been added: Coverage Matrix, Manifests Overview, Manifest Importer Status and some others. These pages do not scale well with the increasing number of institutions and services. They do not take into account other networks that will eventually be exposed in the EWP Registry.

Information pages of the registry have to be reorganized and made more user-friendly, more clearly structured and scalable with the increasing number of supported APIs, involved HEIs and software providers, and other networks included in the registry.

## 4 Registration portal

Server and client endpoints are currently stored in manifest files and are only partly under control of the institutions. There are many duplicates in the network which are generated by the global service providers. The ownership of the manifest file is verified when the URL of the file is added to the registry. The network operator checks the content of the file and adds the expression filtering the institutions covered. However, the list of supported APIs can be changed by the owner of the file any time.

The network operator gets such requests every couple of days and handling them is time consuming, especially if there are errors in the file or legal issues that need to be resolved.

The Registration Portal will allow authorized representatives of the institution (credentials will be verified by eduGAIN) to register manifest files of this institution. By registering only URLs of the manifest files we leave switching APIs on/off to software. It need not be handled in the portal by human, which would be more error prone.

## 5 Structure of the manifest file

Currently the manifest file can contain many institutions, which makes the implementation easier but control of the ownership more difficult. The new schema will accept only one host element per manifest with only one institution. Each HEI will own one (or more) manifest files but will not share them with other HEIs. The ownership will be easy to verify and track. HEI will register its manifest files in the Registration Portal. A regular expression for filtering institutions will allow for one SCHAC only (SCHAC being the global unique identifier of the institution). The Registration Portal will create the file with the list of manifest locations (manifest-sources.xml<sup>§§</sup>). The Registry will check if the file has changed, read the new version and use it to browse the network.

## 6 Other networks

The EWP Network was originally designed for HEI-to-HEI exchange of data on the mobilities under the Erasmus+ Programme. There are other important services for students and HEIs delivered by service providers or networks of service providers. These services might also be registered in the EWP Registry to increase their visibility and enable discovery by HEIs. The new design allows for storing in the EWP Registry information for the EMREX clients about Data Access Points in the EMREX Network. Similar solution is planned for the ESC Router of the European Student Card<sup>\*\*\*</sup> and the Mobility Tool+, EC's online management and reporting system<sup>†††</sup>.

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<sup>§§</sup> <https://github.com/erasmus-without-paper/ewp-registry-service#prepare-the-manifest-sourcesxml-file>

<sup>\*\*\*</sup> <https://router.europeanstudentcard.eu>

## 7 Conclusions

The envisioned changes support industrialization of the network operation, scalability, automation, avoidance of errors and easy error tracking. Specification of the APIs will cover changes in official templates announced by the EC.

## 8 Acknowledgments

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## 9 References

*All links have been retrieved in April 2021.*

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## 10 Author biographies



**Janina Mincer-Daszkiewicz** graduated in computer science in the University of Warsaw, Poland, and obtained a Ph.D. degree in math from the same university. She is an associate professor in Computer Science at the Faculty of Mathematics, Informatics and Mechanics at the University of Warsaw specializing in operating systems, distributed systems, performance evaluation and software engineering. Since 1999, she leads a project for the development of a student management information system USOS, which is used in 70 Polish Higher Education Institutions, gathered in the MUCI consortium. Janina takes an active part in many nationwide projects in Poland. She has been involved in Egracons, EMREX, Erasmus Without Paper, European Digital Student Service Infrastructure European projects.

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<sup>†††</sup> <https://webgate.ec.europa.eu/fpfs/wikis/display/NAITDOC/Mobility+Tool+-+Guide+for+Beneficiaries>