# A fish in your ear: making sense of European higher education with Edu-API

Ola Ljungkrona, Gill Ferrell and Per Hörnblad

[1] LADOK, Sweden
[2] IMS Global Learning Consortium, France
[3] Umeå University, Sweden

`ola.ljungkrona@gu.se, gferrell@imsglobal.org, per.hornblad@umu.se`

## Abstract

The European higher education landscape is a complex intermix of policy, regulation, data and systems with a different take on these elements in each country. At the higher education provider level, interoperability across this ecosystem is essential to facilitate collaboration in teaching and research and student mobility. At the European level, reliable and comparable data is needed for the implementation of cross-cutting policies relating to areas such as social mobility and meeting labor market needs.

System suppliers need a specification for core student data in this ecosystem to identify common needs and priorities. At the national and institutional levels, stakeholders need confidence that it is possible to build an interoperable infrastructure that minimizes costs, maximizes collaboration and helps future-proof their investment.

This paper presents work in progress that is making sense of this vastly complex area. Edu-API is a specification in development that addresses one of the most difficult problems in the higher education domain: making data from student information systems available for other uses.

We look at the status of current work, benefits (both short term and ability to support EU wide policy initiatives in the longer term), and opportunities for stakeholders from both the education and supply side to get involved in shaping this work.

## 1 Background

The title of this paper is inspired by The Hitchhiker's Guide to the Galaxy (Adams 1979): a cult science fiction work that started life as a radio show (in the days when wireless meant something completely different) and was later turned into a series of books, a TV series and a film. The adaptation of the core work to different formats is pertinent to the theme of the paper.

The Hitchhiker's Guide to the Galaxy follows the fortunes of an Englishman, Arthur Dent, who is left to explore the galaxy, in his pajamas and dressing gown, when Earth is destroyed to make way for a hyperspace bypass. Arthur finds the experience marginally less confusing once he has a Babel fish[1*] inserted into his ear and hears any speech translated into his native language.

The metaphor here is not the misfortune of Arthur Dent but rather the notion that a core set of information can be consumed in a variety of different media formats, in different languages and accessed using different technologies. The processes required to achieve this for a work of science fiction comedy are already complex. Achieving this with student information on a European scale presents a problem that is (to quote Adams 1979 again) "vastly, hugely, mind-bogglingly big".

This paper will present work in progress that is making sense of this vastly complex area. Edu-API is a specification in development that addresses one of the most difficult problems in the higher education domain: making data from student information systems available for other uses.

We will look at the status of current work, benefits (both short term and ability to support EU wide policy initiatives in the longer term) and opportunities for stakeholders from both the education and supply side to get involved in shaping this work.

## 2  About Edu-API

Edu-API is a technical specification currently being developed by the non-profit IMS Global Learning Consortium. Edu-API lies at the heart of making core enterprise data from student information systems available to the rest of the learning ecosystem. Some IMS standards are already a de facto part of the ecosystem: such as the LTI® standard for the interoperability of learning content and the QTI® standard widely used in the assessment domain. Data in student record systems is, however, frequently 'locked in' in such a way that migration to new systems, or cloud services, is time consuming and costly and data exchange with other systems involves complex point-to-point integrations.

Edu-API is still work in progress but is based on a tried and tested approach. It has grown out of work such as the IMS Learning Information Services (LIS) specification (and European adaptations of this by SUNET and SURF), the Learning Tools Interoperability® (LTI®) standard and similar work, widely adopted in the school sector under the 'OneRoster®' standard.

What is interesting, from a European perspective, is that this is the first time an IMS standard (by definition an international standard) has been developed through the efforts of a European task force in parallel with work undertaken in the US.

Edu-API is platform-agnostic and is being structured to work with different infrastructure topologies. Core administrative data is being put to an increasing range of uses (learning analytics being a good example) whilst at the same time, increased use of cloud services means developers have less direct access to data. In this scenario the existence of robust, flexible APIs takes on increasing importance if we are to develop robust, secure and scalable services.

## 3  European activity

As of the first quarter of 2021, the European Edu-API Task Force is looking at the data model that underpins the specification.

Some of the issues to do with internationalization are fairly classic problems such as the fact that names are handled differently in different countries. It is important to have a good spread of European

---

[*] The fictitious Babel fish is described as "small, yellow, leech-like, and probably the oddest thing in the Universe". The fish is placed in someone's ear in order for them to be able to hear any language translated into their first language.

participation so that the different variants are taken into account at the design stage. For example, the prefixes in Dutch/German names (and whether or not they are capitalized depending on context) and the number and order of Spanish/Portuguese family names. These may seem like small things but can cause major issues in the usability of international software products.

Other matters are more higher education domain specific such as the difficulty of arriving at a common understanding of the entity relationships that describe what students are studying: "Although the term 'course' is virtually universal, it has different meanings for different stakeholders." (Ferrell 2013. See also HESA 2011).

In Sweden the national Student Information System is managed by the LADOK consortium who have developed a standardized LIS-adapter that allows consuming system to receive student information data according to the IMS LIS information model. The adapter uses an asynchronous interaction model for message transport and messages can be distributed to consuming system such as an LMS. The adapter can also receive asynchronous messages to insert student results, for example from an LMS like Canvas or Blackboard. In this way LADOK can provide a stable endpoint with very controlled versioning. It also means that the LADOK API transformation to a new standard like Edu-API is a simple task to perform.

This benefits LADOK performance, as the loose coupling with consuming services dramatically increases the portability between services. Furthermore, this becomes a strong driver to promote this pattern within the Swedish higher education sector for increased efficiency and cost reduction but also because it offers greater flexibility to adapt to customer requirements due to the fact that everyone is using the same service.

# 4  Benefits

Edu-API will address the massive problem of getting systems to work together so that student data can be input once and used for different administrative purposes and in different parts of the learning ecosystem. Having a single, coherent industry standard avoids the need for costly custom integrations that need to be maintained and updated over time leading to fragility and inefficiency in the overall digital ecosystem.

What we see now in Sweden is a broader acceptance among higher education institutions to start using the IMS standard in other applications like scheduling, student mobility and digital exams as well as in the student account provisioning process. Take-up has been particularly strong in areas relating to student mobility which operate in an international context and need to connect to various different Student Information Systems. The Swedes are also noticing that willingness to conform with the standards is increasing among system providers because they realise the efficiencies that come from doing integration once rather than creating complex, locally designed integrations for every new service.

System implementation and system change will be simpler and cheaper, and it will be easier to grow the ecosystem adding and removing a variety of tools over time. Important benefits relating to initiatives that concern many European institutions at the moment, include facilitating the exchange of student data with a learning records warehouse for effective analytics and use of student data for campus card applications.

Further down the line, widespread adoption of a single standard in student record systems should have a knock-on effect in being able to influence the data collection practices of statutory and regulatory bodies making it easier to implement EU wide policies to improve outcomes such as social inclusion and meeting labor market needs e.g. European Commission (2021) plans to implement graduate tracking.

# 5  Get involved

Ensuring that Edu-API is developed in such a way as to meet European needs from the beginning, is a community development by the IMS Europe Edu-API Task Force.

EUNIS and IMS have collaborated via a partnership agreement for a number of years. EUNIS has a seat on the IMS Europe Leadership Board and the Edu-API Task Force includes representation from a number of EUNIS member organizations. Due to the importance of this work, and its significance for the sector, additional participation from universities willing to become contributing members, would be welcomed.

Initiatives such as this offer opportunities to strengthen the connections between our partner organizations and to have a practical impact on digital transformation in European higher education.

Readers interested in this initiative are invited to contact the authors for more information.

# 6  References

Adams, D. (1979) The Hitchhiker's Guide to the Galaxy. New York: Harmony Books.

European Commission (2021) Towards a European graduate tracking mechanism. Retrieved February 20, 2021, from: https://op.europa.eu/en/publication-detail/-/publication/c5669b4b-6adb-11eb-aeb5-01aa75ed71a1

Ferrell, G. (2013) Managing Course Information. Jisc Retrieved February 20, 2021, from: https://www.jisc.ac.uk/full-guide/managing-course-information

HESA (2011) What is a course? Jisc. Retrieved February 20, 2021, from: https://www.hesa.ac.uk/files/What-is-a-course_2011.pdf

IMS Global Learning Consortium (2020) Edu-API: a global community initiative driving the next generation of higher education student system interoperability. Retrieved February 11, 2021, from: https://www.imsglobal.org/edu-api

# 7  Author biographies

Ola Ljungkrona has a Master's Degree at Chalmers University of Technology (1992-1997). Since 2015 he has been working as an Enterprise Architect/Business Analyst for the University of Gothenburg.
https://www.linkedin.com/profile/view?id=7735701

Gill Ferrell has led the EUNIS Learning and Teaching SIG since 2009. She also has an interest in data and information management. In March 2021 she joined IMS Global Learning Consortium as IMS Europe Program Director.
https://www.linkedin.com/in/gillferrell/



Per Hörnblad is a senior IT Architect at Umeå University. He is coordinator of a national network of Enterprise Architects in the area of higher education in Sweden and manager for a national project group involved with innovation project to support IT in higher education in Sweden.
https://www.linkedin.com/in/per-h%C3%B6rnblad-56401b14/