

# EMREX in Poland

## supporting internal mobility

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# Agenda

- EMREX project
- EMREX architecture
- Internal mobility in Poland (MOST)
- Implementation of EMREX for USOS
- Summary



# EMREX

Field trial on the impact of enabling easy mobility  
on recognition of external studies



EU Erasmus+ KA3 project (2015-2017).

**Danmark, Finland, Italy,  
Norway, Sweden**



- building platform for an effective transfer of student's records between partner institutions,
- running field trial.



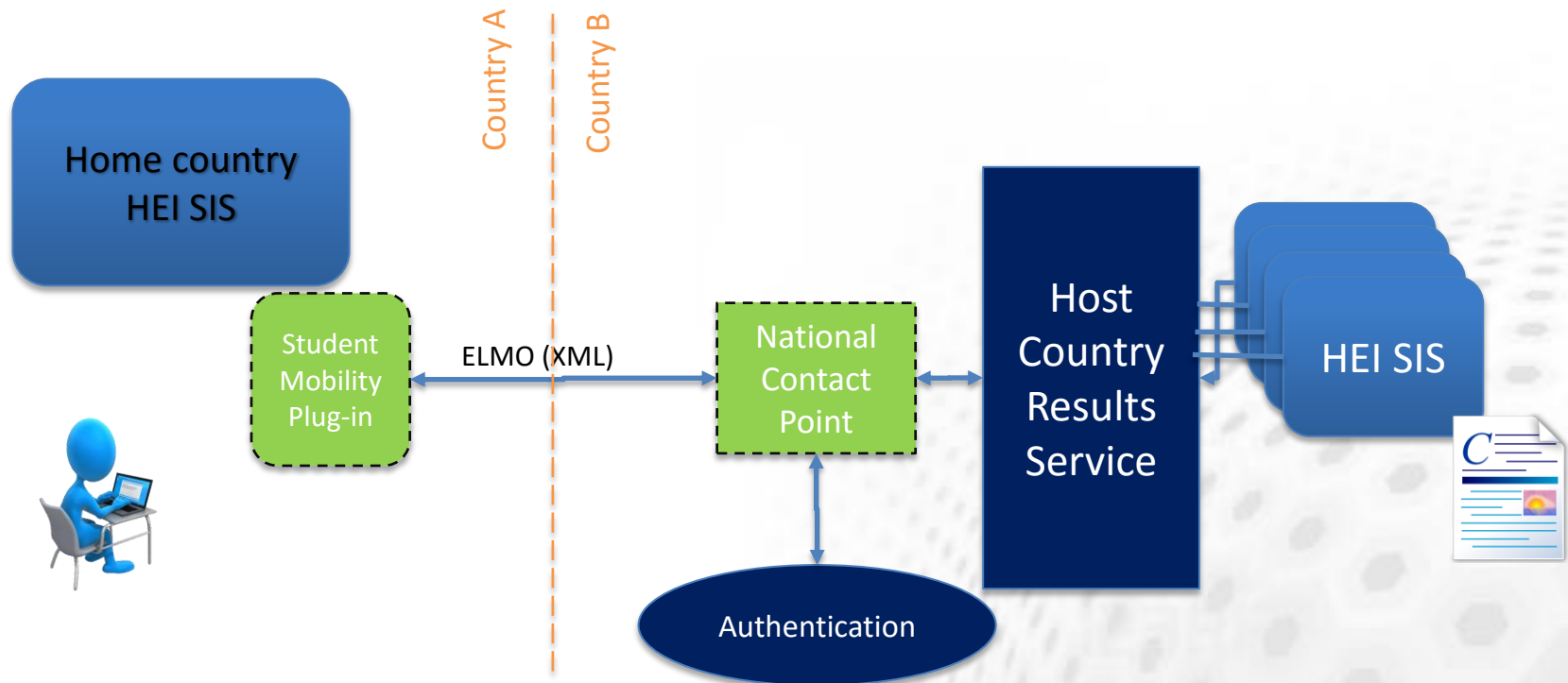
**Poland** as evaluation body measuring impact on recognition, quality, scalability of the solution from the technical perspective.

# Project goals – details



- Data format – EMREX-ELMO XSD posted on GitHub.
- Each partner adds **student mobility plug-in (SMP)** and **EMREX Client** to local student information systems (**SIS**), sets up **national contact points (NCP)** at country-level through which partner institutions may get access to data on student achievements.
- Data transfer is initiated by students.
- Authorization is required at home institution and host institution.
- Common software is open source and can be reused by new institutions.

# How it works?



Student returning home can retrieve his achievement data electronically

# Poland internal mobility

- **MOST** (Polish word for **bridge**) is a mobility program for Polish students.
- Based on the rules similar to Erasmus+ but limited to students of Polish HEIs.
- Coordinated by UAC (**University Accreditation Commission**) established in 1998 by the **Conference of Rectors of Polish Universities**.
- Involves **20** Polish public universities, members of UAC, and **8** associated HEIs.
- **15** of these HEIs belong to consortium **MUCI** and use the same SIS → **USOS**.
- Covers over **400** fields of studies.
- Over **6000** students took part in the program since its start in 1999.
- Statistics for the academic year 2015/2016:
  - 2967 study offers,
  - almost 1000 students registered in the admission system,
  - 501 students qualified for studies at bachelor and master level,
  - 33 students qualified for doctoral studies.



# Admission to MOST

- Since May 2010 admission to MOST is carried at **IRK-MOST**.
- IRK-MOST is developed by USOS developers and run by MUCI.
- It supports federated identity management.
- Admissions are run twice a year.
- Students may choose up to 3 offers.
- Coordinator from UAC with the help of coordinators from partner institutions qualifies students for the mobility.
- Data of qualified students can be transferred electronically from IRK-MOST to local SIS → USOS. Transfer is initiated by staff of **Student's Office**.

IRK MOST  
Rejestracja na semestr letni roku akademickiego 2015/16  
Program Mobilności Studentów

Start Katalog Rejestracja Wejście... Pomoc

Lista kierunków i specjalności

Wszystkie studia  
Studia I stopnia  
Studia II stopnia  
Studia jednolite magisterskie  
Studia inżynierskie  
Studia III stopnia (doktoranckie)

- administracja (24)
- akustyka (1)
- Ameryka Łacińska (1)
- analityka gospodarcza (3)
- analityka społeczna (1)
- andragogika (1)
- animacja kultury (1)
- archeologia (11)
- architektura i urbanistyka (1)
- architektura informacji (1)
- architektura krajobrazu (2)
- architektura wnętrz (1)
- archiwistyka i nowoczesne zarządzanie zapisami informacyjnymi (2)
- archiwistyka i zarządzanie dokumentacją (3)
- astronomia (5)
- automatyka i robotyka (3)
- bałkanistyka (1)
- bezpieczeństwo narodowe (16)
- bezpieczeństwo wewnętrzne (9)
- biofizyka (3)
- biologia (22)
- biologia i geologia (1)
- biomonitoring (1)
- biotechnologia (15)
- budownictwo (4)

strona 1/9 2 3 4 5 >> nast.

<http://most.uka.uw.edu.pl>

# LA and TR in IRK-MOST

- As is the case of Erasmus+ program
  - before the mobility students prepare **Learning Agreements (LA)** which have to be approved by coordinators from the home and host institution,
  - after the mobility students obtain **Transcripts of Records (TR)** which have to be delivered to the student office at the home institution.
- IRK-MOST **supports** handling of these two documents.
- IRK-MOST may be integrated with HEI's course catalog (which is part of the ECTS guide), so when composing LA student can browse courses and transfer (upload) codes of those selected to LA.
- When LA is ready a special token may be sent to home and host coordinators giving access to LA in IRK-MOST.
- LA may be approved either straight in the system by the authorized person or the scanned version of the signed document can be uploaded into student's account and than its originality confirmed.



# LA and TR in IRK-MOST

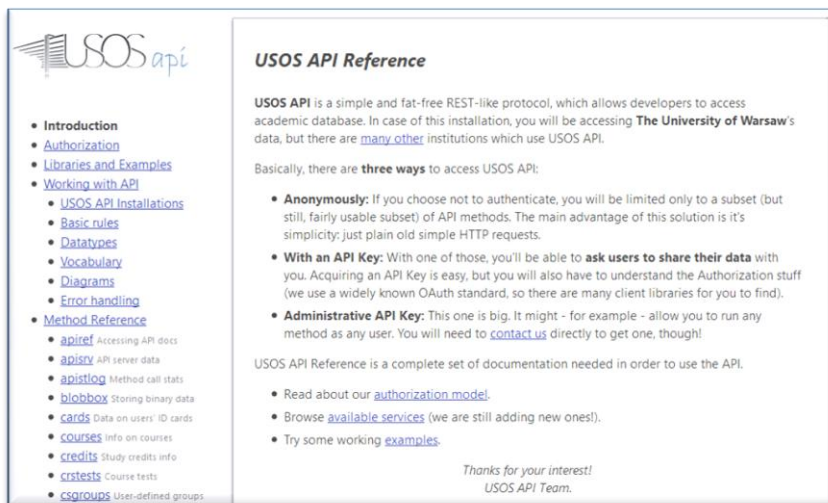
- After the mobility student may himself add grades to LA → TR.
- Such TR has to get approval of the host coordinator.
- The signed and scanned document can also be uploaded to student's account.
- Whatever document is generated electronically from IRK-MOST it is signed with the application certificate.
- An electronic document contains PDF file to be read by human and XML equivalent which may be processed electronically by another application.
- Information about the current status of the document is attached (was it approved/confirmed by the authorized staff member of the involved HEI).
- Various scenarios of information transfer between involved institutions are possible, more or less automatic.
- IRK-MOST can be regarded as one central point for exchange of documents on student mobility between participating HEIs.

# EMREX in Poland?

- IRK-MOST supports exchange of **LA** and **TR** – but program coordinators and partner institutions have not yet decided to deploy that functionality and documents are still exchanged mostly on paper. Possible reasons:
  - Don't want to change procedures?
  - Prefer to stick to local system used daily?
  - Not enough training?
- **Idea → Give initiative to students, they are key benefactors of timely transfer of Transcript of Records.**
- If the Polish partner integrates USOS with the EMREX platform, mobile students from these institutions will be able to easily transfer their transcripts of records from USOS installation at host institution to USOS installation at home institution. No other implementation is required.
- The effect of scale will be immediate.
- If the system proves useful internally, going international will be an easy next step.

# EMREX in Poland – implementation

- Implementation of NCP, SMP and EMREX Client is spread across two USOS subsystems:
  - **USOS API** – a collection of web services, written primarily in Python, publicly documented in English, and designed for use by external consumers. NCP endpoints are implemented in USOS API installations.
  - **USOSweb** – a web portal used by all students and staff members in their daily academic activities, written primarily in PHP. Hosts EMREX Client.
- Every HEI in Poland which runs USOS has its own installation of USOS API and USOSweb subsystems.



**USOS API Reference**

USOS API is a simple and fat-free REST-like protocol, which allows developers to access academic database. In case of this installation, you will be accessing **The University of Warsaw's** data, but there are [many other](#) institutions which use USOS API.

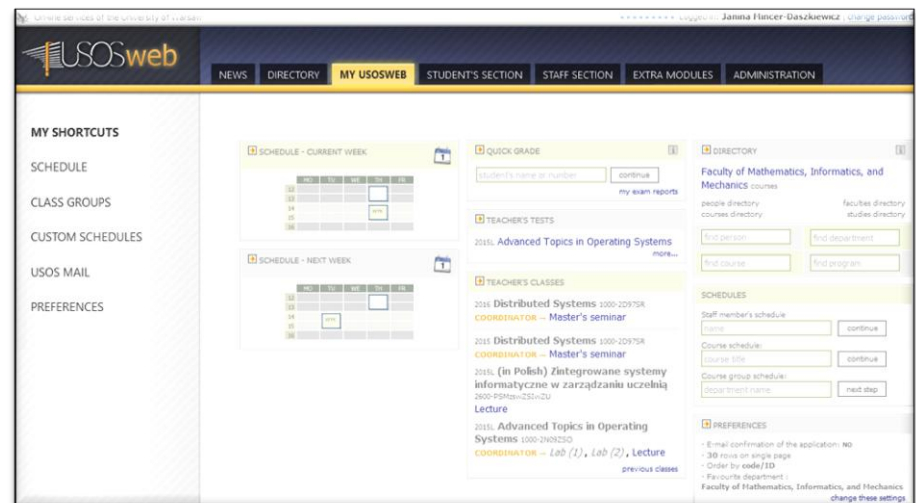
Basically, there are **three ways** to access USOS API:

- **Anonymously:** If you choose not to authenticate, you will be limited only to a subset (but still, fairly usable subset) of API methods. The main advantage of this solution is it's simplicity: just plain old simple HTTP requests.
- **With an API Key:** With one of those, you'll be able to **ask users to share their data** with you. Acquiring an API Key is easy, but you will also have to understand the Authorization stuff (we use a widely known OAuth standard, so there are many client libraries for you to find).
- **Administrative API Key:** This one is big. It might - for example - allow you to run any method as any user. You will need to [contact us](#) directly to get one, though!

USOS API Reference is a complete set of documentation needed in order to use the API.

- Read about our [authorization model](#).
- Browse [available services](#) (we are still adding new ones!).
- Try some working [examples](#).

Thanks for your interest!  
USOS API Team.



**USOSweb**

NEWS DIRECTORY **MY USOSWEB** STUDENT'S SECTION STAFF SECTION EXTRA MODULES ADMINISTRATION

**MY SHORTCUTS**

SCHEDULE

CLASS GROUPS

CUSTOM SCHEDULES

USOS MAIL

PREFERENCES

**SCHEDULE - CURRENT WEEK**

MON	TUE	WED	THU	FRI	SAT	SUN
100	100	100	100	100	100	100
101	101	101	101	101	101	101
102	102	102	102	102	102	102
103	103	103	103	103	103	103
104	104	104	104	104	104	104
105	105	105	105	105	105	105
106	106	106	106	106	106	106

**QUICK GRADE**

Student's name or number:

**TEACHERS TESTS**

2016 Advanced Topics in Operating Systems [more...](#)

**TEACHERS CLASSES**

2016 Distributed Systems 100-109758  
COORDINATOR – Master's seminar

2016 Distributed Systems 100-109758  
COORDINATOR – Master's seminar

2016 (in Polish) Zintegrowane systemy informatyczne w zarządzaniu uczelnią  
Lecture

2016 Advanced Topics in Operating Systems 100-200230  
COORDINATOR – Lab (1), Lab (2), Lecture [previous class](#)

**DIRECTORY**

Faculty of Mathematics, Informatics, and Mechanics courses  
people directory  
courses directory  
faculty directory  
studies directory

Find person:  Find department:

Find course:  Find program:

**SCHEDULES**

Staff member's schedule  
Course:

Course schedule:  
Location ID:

Course group schedule:  
Department name:

**PREFERENCES**

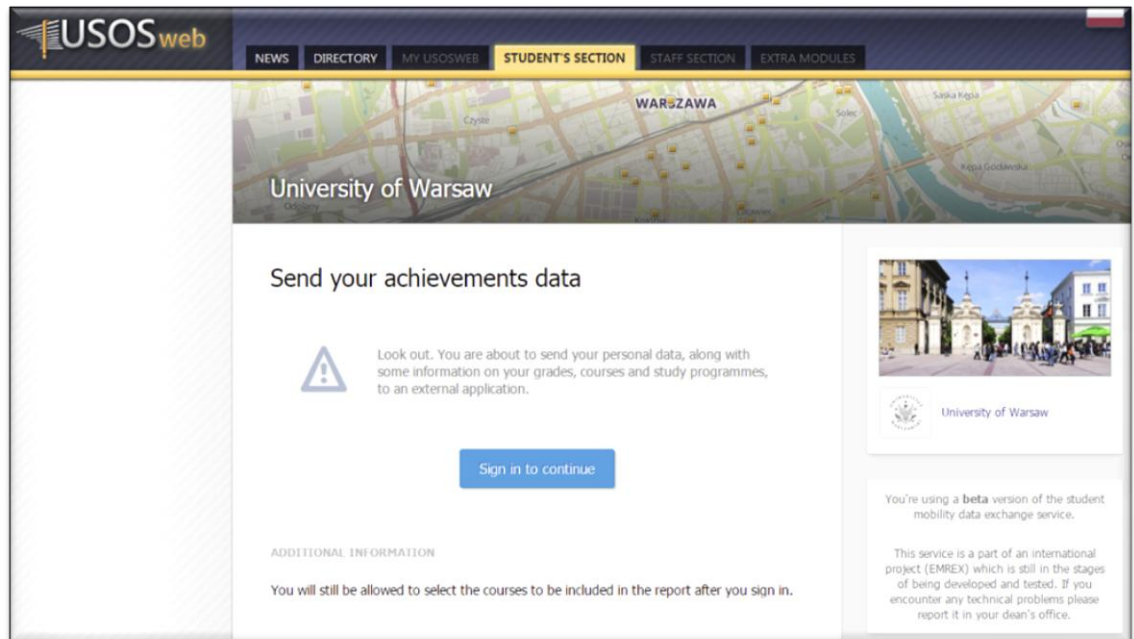
- E-mail confirmation of the application: no
- 30 mins on single page
- Order by code/ID
- Favourite department: Faculty of Mathematics, Informatics, and Mechanics

[change these settings](#)

# EMREX in Poland – implementation

- A user signs in to a local USOS installation and initiates the EMREX exchange on a dedicated USOSweb page.
- USOSweb fetches the list of NCP servers from EMREG via USOS API (USOS API is also responsible for caching EMREG responses).
- The student selects the NCP server on the USOSweb page, and then USOS API method is called with the server's URL.
- The user is redirected to the NCP URL with the return URL parameter referring back to a proper **receiver USOS API method**.
- Once the user accesses the NCP-related USOSweb web page, he is asked to sign in (second time).

## Logging to the NCP of the University of Warsaw




The screenshot displays the USOSweb interface. At the top, there is a navigation bar with the USOSweb logo and several menu items: NEWS, DIRECTORY, MY USOSWEB, STUDENT'S SECTION (highlighted), STAFF SECTION, and EXTRA MODULES. Below the navigation bar is a map of Warsaw, with the text 'University of Warsaw' overlaid. The main content area features a warning icon and the text: 'Send your achievements data', 'Look out. You are about to send your personal data, along with some information on your grades, courses and study programmes, to an external application.', and a blue button labeled 'Sign in to continue'. At the bottom of the main content area, there is a section titled 'ADDITIONAL INFORMATION' with the text: 'You will still be allowed to select the courses to be included in the report after you sign in.' On the right side of the interface, there is a small image of the University of Warsaw building, the University of Warsaw logo, and a notice: 'You're using a beta version of the student mobility data exchange service.' Below this notice, it states: 'This service is a part of an international project (EMREX) which is still in the stages of being developed and tested. If you encounter any technical problems please report it in your dean's office.'

# EMREX in Poland – implementation

- The user is presented with the list of courses and is allowed to select any subset of them.
- When the user clicks SEND, NCP response is constructed with the EMREX-ELMO document (communication with USOS API is done in the background).
- POST request is sent directly from user browser to the EMREX Client.

### Send your achievements data

 Look out. You are about to send your personal data, along with some information on your grades, courses and study programmes, to an external application.

**COURSE SELECTION**

The report which we are going to send to the external application will include the information on your grades and other achievements related to the courses selected below.

Academic year 2014/15:

- History of Byzantine culture - **3,5**
- History of culture in the European Middle Ages - **3**
- History of the contemporary Mediterranean region - **3,5**
- Selected issues of culture of regions - **4,5**
- Seminar – Contemporary Iberia - **4,5**

Winter semester 2014/2015:


- Audiovisuality in culture - **3,5**

**CONFIRMATION**

The report will also include your personal data, such as date of birth, or passport and national security numbers.

University of Warsaw is not related to the person or institution to which the report will be sent, and is not responsible for the way your data will be handled by the recipient. We recommend to continue only if you trust the page which has brought you here.

I understand these warnings and want to continue (required)



University of Warsaw

You're using a beta version of the student mobility data exchange service.

This service is a part of an international project (EMREX) which is still in the stages of being developed and tested. If you encounter any technical problems please report it in your dean's office.

**Selecting results at the NCP of the University of Warsaw**

# EMREX in Poland – implementation

- The user is redirected to the home USOSweb subsystem and presented with the results of the EMREX-ELMO processing.
- The received EMREX-ELMO document is stored and verified.
- If the verification process goes well, and the local system is able to understand the data in the document, then it may additionally allow the student to select the courses which he would like to store locally (this being an extra option).
- Suspicious import requests would need to be approved by an authorized staff member (PDF document attached to EMREX-ELMO XML should be useful in this case).



```

- <elmo xsi:schemaLocation="https://github.com/emrex-eu/elmo-schemas/tree/v1 https://raw.githubusercontent.com/emrex-eu/elmo-schemas/v1/schema.xsd">
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  - <learner>
    <citizenship>PL</citizenship>
    <identifier type="nationalIdentifier">76070584616</identifier>
    <identifier type="usos.user_id">1633846</identifier>
    <identifier type="usos.student_number">1234245442</identifier>
    <identifier type="usos.other_documentP">DB1111111</identifier>
    <givenNames>Filip</givenNames>
    <familyName>Izdebski</familyName>
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  - <report>
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      <title xml:lang="en">University of Warsaw</title>
      <url>http://www.uw.edu.pl</url>
    </issuer>
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      <title xml:lang="en">History of Byzantine culture</title>
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      <subjectArea>09200</subjectArea>
      <iscedCode>0231</iscedCode>
    </url>
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        <date>2015-06-09</date>
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        <title xml:lang="pl">Rok akademicki 2014/15</title>
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        <end>2015-06-09</end>
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      <title xml:lang="pl">Rok akademicki 2014/15</title>
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      <end>2015-06-09</end>
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      <languageOfInstruction>pl</languageOfInstruction>
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  </specifies>

```

```

-<extension>
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</extension>
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  -<ds:SignedInfo>
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    <ds:SignatureMethod Algorithm="http://www.w3.org/2001/04/xmldsig-more#rsa-sha256"/>
  -<ds:Reference URI="">
    -<ds:Transforms>
      <ds:Transform Algorithm="http://www.w3.org/2000/09/xmldsig#enveloped-signature"/>
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    </ds:Transforms>
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</ds:SignedInfo>
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  </ds:X509Data>
</ds:KeyInfo>
</ds:Signature>
</elmo>

```

## EMREX-ELMO XML continued



# Other issues

- The solution will first be available for testing on **USOS DEMO** – special test bed of USOS based applications, with anonymised data, fully functional, intended for testers, training, institutions which want to integrate their systems with USOS.
- **Federated identity management** for Polish HEIs will help in solving the problem of student authorization at the country level.
- **Validity of students accounts** in home and host institutions after students leave the institution – keep these accounts active indefinitely.
- How to translate student achievements expressed in the context of regulations and culture of the host institution to that of the home institution – **grade conversion** (Egracons project).
- **Transcript of Records** – simpler version for incoming students.

# Summary

- Implementation of the EMREX solution for Polish HEIs from MUCI will be available in the next official distribution (no extra cost involved).
- Initiative is on the side of the students, they are the main benefactors. This may be the key to successful deployment.
- IT solutions should be tailored to needs/expectations/capabilities of the organization at its current stage of development.
- Changes in institutional administrative procedures can be more challenging than software development.
- Testing them internally can be a useful proof-of-concept.
- If the EMREX scenario proves useful it may open the door for more sophisticated scenarios of data exchange (e.g. Erasmus Without Paper).
- **Acknowledgments** – EMREX is a common work of all project partners. Many thanks.



# Additional information

- EMREX website: [www.emrex.eu](http://www.emrex.eu)
- EMEX on GitHub: [github.com/emrex-eu](https://github.com/emrex-eu)
- Versions of XML Schema for EMREX-ELMO  
[github.com/emrex-eu/elmo-schemas/releases](https://github.com/emrex-eu/elmo-schemas/releases)
- EMREX wireframes  
<https://moqups.com/lundin.goran@gmail.com/2sWGyfXn/p:a2fa73ae2>
- USOS API in the University of Warsaw  
<https://usosapps.uw.edu.pl/developers/api>.
- USOSweb in the University of Warsaw <https://usosweb.uw.edu.pl>.
- Survey for mobile students on recognition (please distribute)  
<https://ankieter.mimuw.edu.pl/en/surveys/81/>

**Register for EMREX Newsletter to keep in touch!**