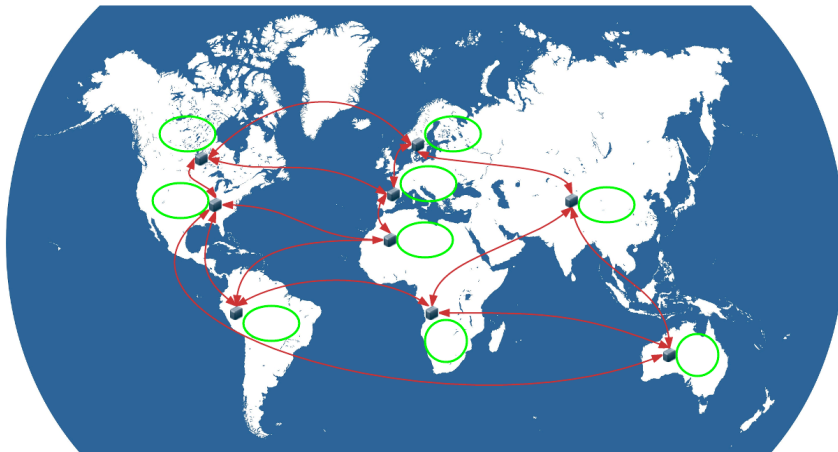


PROPOSED INTERNATIONAL EDUCATIONAL NETWORK

**Global Educational
Communication**



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INTRODUCTION

As demonstrated by growing participation in the Groningen Declaration Network, there is a need for international communication to foster student mobility. Lack of standards and the difficulty in establishing trading relationships create a substantial hurdle to building communications channels.

Significant developments have been made building networks in Europe, United States, Canada, Australia and New Zealand and building national repositories in China, India and South Africa. These developments suggest the time is now to plan for international cooperation in communicating student data.

In addition, an effort is underway by the Post-Secondary Educational Standards Council (PESC) and its members to create a global institution list. This list is a critical enabler for educational communication. It could become a global directory of all potential educational trading partners.

There are significant benefits with a standard communication approach. One of the main benefits is to greatly increase the likelihood of large scale adoption. When the international educational community recognizes that there is a direct path to share data, adoption will follow. Potential trading partners can experience faster “time to market” in their efforts to communicate internationally and be assured that communication will occur in a consistent fashion.

I propose that these burgeoning regional networks, national repositories, credential evaluation agencies, vendors, governments and other educational organizations establish data trading relationships, and communicate using a global directory and a standard communication protocol.

BACKGROUND

CHALLENGES

Organizations that wish to share educational information with other global trading partners face many challenges.

Separate agreements are currently required between potential trading partners to establish electronic communication. Setting up these agreements can be time consuming and expensive. Because no international standards exist, organizations must create unique communication protocols to be used with each trading partner.

Trading partners are forced to set up their own institution lists because there is no one standard list of identifiers. There is also no standard directory of trading partners which greatly hinders movement towards an international solution.

Because of the differences in trading relationships, less opportunity exists for organizations to learn from others who have already attempted this type of communication.

CURRENT STATE

Below are some examples of regional networks and repositories. This list is by no means complete. Those examples listed here, however, show that significant momentum exists to begin this discussion.

Regional networks

Regional networks are in development or in place in various parts of the world.

Erasmus Without Paper (EWP) – A network, currently under development, consisting of a consortium of 11 partner institutions composed of public institutions, higher education organizations, and companies from 8 European countries.

EMREX – A network, currently in field trial, consisting of four Nordic countries (Norway, Finland, Denmark and Sweden) and Italy.

EdExchange - A network with major stakeholder support currently piloting in the United States and Canada.

My eEquals – A new system/network consisting of an ever expanding list of institutions from Australia and New Zealand.

National Repositories

CHESICC (China Higher Education Student Information and Career Center) - China

CDSL (Central Depository Services Limited) - India

NLRD (National Learners' Records Database) – South Africa

Global Institution Code

At the time of this writing, PESC, with international support, is creating a global institution list called the Global Institution Code. This will be a list of institutions from every country in the world with a unique code assigned to each. The list will grow as more countries are examined.

A list like this is a direct enabler of electronic communication. Without a single, universally recognized code for each institution, large scale educational data transfer would be impossible. This standard code eliminates confusion between senders and receivers when referring to institutions.

Currently, the list includes Australia, New Zealand, Poland, India, China, United Kingdom, South Korea, Brazil, and the United States.

SOLUTION

There are many components needed to make this a successful communication model.

STANDARD COMMUNICATION PROTOCOL

To facilitate adoption and guarantee long term interoperability, a standard communication method should be adopted and implemented by all trading partners. The standard for the international educational network (referred to here as “the standard”) would define how trading partners connect, how information is requested and how information is securely transmitted.

GLOBAL EDUCATIONAL DIRECTORY

If we take the concept of the Global Institution Code further, this list of institutions could be part of a global directory. In addition to institutions, the directory would contain other organizations (credential evaluation agencies, vendors, governments, etc....) that want to trade educational data. Importantly, it would also include the regional networks and national repositories. While the institution list guarantees institutional identity within the data, the directory would capture the network address of all trading partners and enable educational data delivery.

STUDENT AUTHORIZATION

Authorization by the student to share their data is critical. The standard should include a method of verifying student authorization.

REQUEST AND RESPONSE CAPABILITY

This standard must put into place the ability to request information and the ability to respond with information. In general, one organization will request information (the requester) and another will respond by transmitting the information requested (the responder). Each message would illicit an acknowledgement to provide assured message delivery.

See the Appendix for more detail.

NATIONAL REPOSITORIES

Individual countries can create a single, authoritative repository of student data. These repositories would put a computer server (or other computing asset as appropriate) in place to act as an interface to their repository. This interface would implement the standard discussed above. It would send requests to, and respond to requests from international trading partners.

REGIONAL NETWORKS

Regional networks are in development or in place in several regions. Networks could be peer-to-peer meaning that each participant can communicate to each other participant without central network control. Networks could also be in a hub and spoke model where data is stored by the participant but the central network hub manages data transfer. The goal is for the local network to continue to support the interests of its participants, operate using its own internal communication protocols, and to limit the impact on day to day operations.

Peer-to-Peer Networks

For peer-to-peer networks, a server would be designated to interface with the world called the "external point of contact" (EPOC) here. International organizations wishing to interact with any participant on

the local network would communicate with this EPOC. The EPOC would act as a go-between and forward any incoming requests from external peers to local network participants. Communications between local network participants would not be affected. The EPOC would implement the standard described here and translate messages to its internal communication protocol.

When local network participants want to respond to a request or make a request outside of the local network, they would contact the EPOC using the local network's internal communication protocol. The EPOC would then translate the message to the standard and send it to its destination.

Hub and Spoke Networks

Hub and spoke networks would put an EPOC in place to act as an interface to the local network hub. Other than only communicating to the hub, the EPOC would operate as described in peer-to-peer networks above.

NETWORK ENABLEMENT

A reference implementation of the network interface, with a full implementation guide, should be developed. This would act as the external point of contact (EPOC) for regional networks or be used by a national repository. Trading partners can save time by using a reference implementation.

The consortium, mentioned above, should create and manage the reference implementation. PESC's open source EdExchange could be used as a starting point.

MESSAGE AGNOSTIC

This standard would not define the content of the message. Although standard data structures will be critical to student data portability, those will be the result of other standards writing efforts. These discussions are beginning now.

HANDLE DOCUMENTS AND DATA

Much educational information today exists and is available in paper form. This paper is often captured in PDF (portable document format) form so that it can be distributed electronically. Many organizations throughout the world are making educational information available as structured data. This data can be represented in various formats (EDI, XML or JSON). Although the standard to be created would be message agnostic, it should be said it must handle both documents (in PDF or other form) and any form data.

SECURITY

The standard will need to include methods to require trading partner authentication and encryption of data in transit. **Establishing security and authentication protocols may be challenging but are absolutely vital.**

USE CASES

The following are two important use cases.

Credential Evaluation Verification

Credential evaluation depends on the ability to verify documents directly with the issuing institution. Communicating the need for verification can be done via mail, email or, more recently, by direct electronic communication. Standard international communication would greatly facilitate the speed and effectiveness of credential evaluation.

Educational Data Transfer

As electronic data becomes more common, it will replace the need for verification. Credential evaluators will no longer need to verify a student's education once that education can be retrieved directly and securely from the issuing institution.

TRADING PARTNER RELATIONSHIPS

Relationships should be established between all trading partners. These relationships will help all involved understand their shared needs, share lessons learned, trade valuable solutions to common problems and create a sense of community. **The need for this kind of cooperation cannot be understated.** This cooperation should lead to ownership and administration of the international educational network.

A consortium should be formed, including all interested stakeholders, to write this standard and begin steps to establish the global directory.

CONCLUSION

Without standards, a global list of institutions, and a global directory, international educational communication will be difficult or impossible. However, recent developments in regional networks, national repositories and a global institution list make this the right time to begin.

Fostering student mobility, providing faster “time to market”, assuring consistent communications, and increasing the likelihood of large scale adoption are all advantages of a secure, standard communication approach.

It is critical that existing and potential trading partners begin collaborating to establish a communication standard and a global directory leading towards an international educational network. We need to establish a shared vision of the future so that we, as a community, can move forward in a common direction.

APPENDIX

REQUEST AND RESPONSE DETAIL

Request

The requester will look up the address for the destination in the Global Educational Directory. This address would be comprised of an identifier for the regional network or repository and the Global Educational Directory code for the destination.

The requester would prepare a message that tells the sender what information is needed. These information types may need to be defined regionally to support the variety of educational outcomes throughout the world.

The requester would compose a “request” message, address it to the destination of the responder, identify the information needed and send it.

Request Acknowledgment

The responder would receive the request and unpack the message contents. The responder would then verify the message is intended for them by comparing the destination address and that the information requested is available. If either of these things is not true, the responder would immediately acknowledge their inability to respond with the reason why. If the request looks sufficient and accurate, the responder would immediately acknowledge affirmatively.

The responder would compose a “request acknowledgment” message, address it to the responder, include the request identifier and the outcome of the request and send it.

Response

Having received a valid request, the responder will take whatever time they need to prepare a response. Ideally, the response would be very close in time to the request, but that is not necessary. Depending on the technical capability of the participant, it may take some time to respond. A guideline, defining expected response timeframes would an interesting follow up.

The responder will compose a “respond” message, addressed to the requester, include the request identifier and either the requested data or “No Data Found”.

Response Acknowledgment

The requester will compose a “response acknowledgment” message, addressed to the responder and include the request identifier to indicate the response was received.

PROPOSED STANDARD DATA ELEMENTS

The proposed data elements of the standard would be as follows:

- *Request Identifier*
- *Requester Address*
- *Responder Address*
- *Message Type (Request / Request Acknowledgment / Response / Response Acknowledgment)*
- *Requested Data*

DIAGRAMS

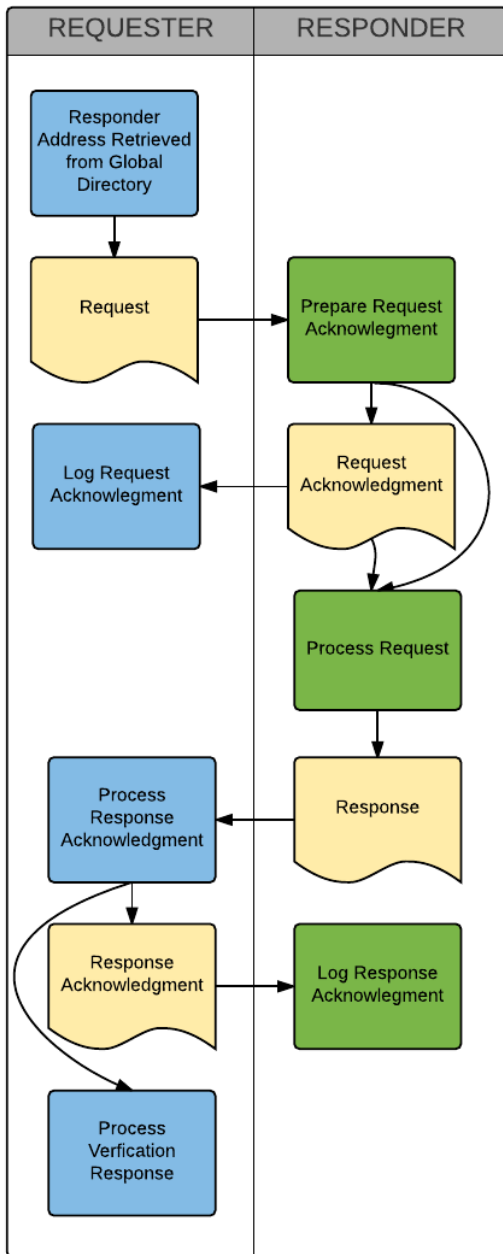


Figure A

Shows communication between requester and responder. This would describe interaction between a requester and a national repository.

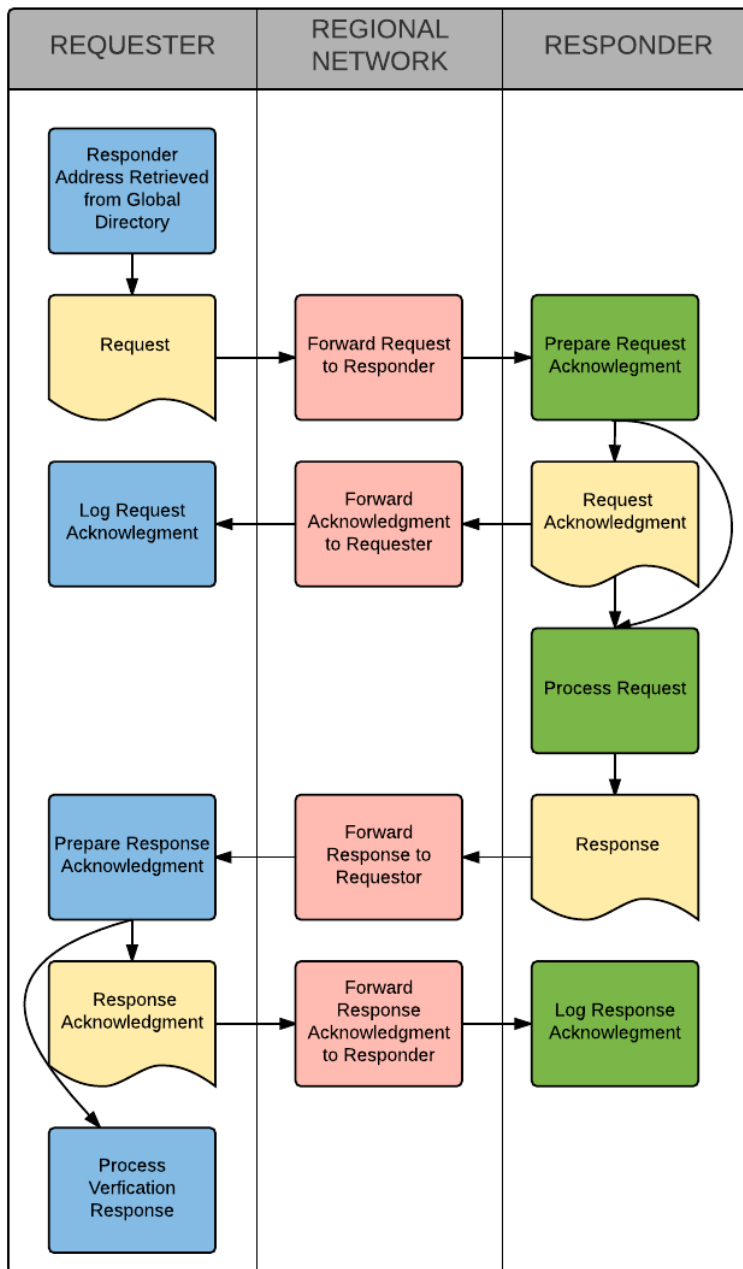


Figure B

Shows communication between requester and a responder that is part of a regional network.

RESOURCES

NAME	LINK
Erasmus w/o Paper	https://www.erasmuswithoutpaper.eu/
EMREX	http://emrex.eu/
EdExchange	https://edex-directory-open-pilot.ccctechcenter.org/
My eQuals	https://www.myequals.edu.au/
CHESICC	http://www.chsi.com.cn/en/
CDSL	https://www.cdslindia.com
NRLD	http://saqa.org.za/show.php?id=5689