Linnaeus-Palme in RAUK: Digitalization of student mobility grant management for HEIs in Sweden

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May 7, 2018

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1. SUMMARY

The Swedish Council for Higher Education (UHR) provides organizations in Sweden with the opportunity to participate in international exchanges and partnerships. Within the scope of the Linnaeus-Palme partnership and exchange program, Swedish universities and university colleges can apply for project funding. The objective is to establish long-term mutual collaborations and cooperation with HEIs in low- and middle-income countries. Integration of the global perspective can thus contribute to quality improvements in Swedish higher education. In this paper, we present the technical platform that facilitates the application and administrative processes and procedures involved.

2. BACKGROUND

UHR is responsible for the administration of the Linnaeus-Palme student exchange and mobility program. Linnaeus-Palme consists of two parts, namely, a planning part ("Linnaeus-Palme planering") and the actual exchange, partnership, and long-term co-operational part ("Linnaeus-Palme partnerskap"). The program is financed by the Swedish International Development Cooperation Agency, Sida, a government agency working on behalf of the Swedish parliament and government, with the mission to reduce poverty in the world and to contribute to implementing Sweden's Policy for Global Development. Funding for planning is provided on a participant-related basis. Financial contributions for the partnership program are distributed on a flat-rate basis that is composed of different factors such as travel destination, travel costs, language training, etc. In both cases, applications and participating organizations' reports need to fulfil the requirements for being eligible for funding by the program such as the structure of the cross-border partnership as well as the general compatibility with the program objectives and principles. The above-mentioned needs call for an adaptable, technical platform that is apt to implement diverging business logic for calculating grant amounts, while using the same architectural and design patterns for the mutually shared procedures.

3. GOALS OF THE RAUK PROJECT

The overall objective of the development project was to build a robust and scalable IT expert application and decision support system that would enable HEIs in Sweden to apply for funding within the scope of the Linnaeus-Palme partnership and exchange program, and further, mainly Sida-funded mobility programs. The internal interface and domain logic of the system needed to be designed according to the requirements of the complete business cycle. The latter includes client application, UHR-operated funding application administration and fund payments dispensation, client reports, follow-up, and application plus report business case closure, but – if need be – also organizational workflows concerning withdrawal of funding. The goal was to create a system that could describe all possible mobility scenarios, and could construct suitable data models for the

client data that UHR needs to capture, process, and store. Moreover, the objective was to produce an IT system where appropriate document formats for accessing and archiving data related to client applications for funding and travel reports could be created. Finally yet importantly, we wanted RAUK to take care of identity management with suitable security policy features as well as appropriate authentication and authorization methods.

4. RAUK'S SYSTEM ARCHITECTURE IN A NUTSHELL

The complete system was developed and programmed in ASP.NET MVC 5 C# (.NET Framework 4.5). A major division lies between the external, web interface client system and the internal, web interface administrative system layer used by managers and administrative staff. The underlying business logic is shared by both of these system parts. Read/Write I/O transactions are executed on to a shared SQL database. RAUK uses a code first approach with Entity Framework as the ORM framework of choice.

The system includes two external system integrations; to the accounting system Agresso, which facilitates payment transactions and refunds between UHR and institutions participating in the exchange program and to the web survey software Webropol. RAUK uses the latter for result reporting and aggregation of travels, collaborations, and cooperation activities. Support is also provided for evaluation, control and approval workflows as well as statistical analysis.

5. PAYMENT TRANSACTION HANDLING THROUGH SYSTEM INTEGRATION (SI)

RAUK handles payment transaction processes through its integration with the external accounting system Agresso. Export of imbursement data (client account numbers and related data) is triggered manually as this step also involves extra administrative surveillance and verification of the figures. Agresso imports these exported data on a daily basis. Next, the UHR corporate finance department initiates further manual and automated procedures, which facilitate funding payment transactions to eligible organizations. Similarly, client refunds that sometimes are necessary (and complicated) due to withdrawal of funding in relevant cases, e.g. owing to travel cancellations, are imparted between RAUK and Agresso through a mixture of manual and automated export and import routines. All in all, this solution allows for efficient administrative business processes in terms of cost and time while providing the best possible supervision and procedural safeguard.

6. LESSONS LEARNT, CHALLENGES, AND FUTURE DEVELOPMENT EFFORTS

Overall, the current implementation of the presented, in-house developed system meets the needs of HEI customers and administrative staff at UHR. The benefits can mainly be thought of in terms of introducing smart, secure, paperless, and digital workflows. Our agile development process has helped us in meeting changing and challenging requirements over time such as modifications in Sida budgeting and the need to reevaluate major business processes.

Concerning digitalization development efforts in the future, we envision on the one hand some extended CMS features. These can help exchange program administrators to work more efficiently while preparing updated information before a new grant application or report period opens. On the other hand, parameter-steered flexibility for designing/redesigning forms and underlying payment calculations for financial contributions are desirable future features of subsequent system upgrades. Another challenge we predict, might lie in future needs for the implementation of AI robotization and automation features with the aim to provide enhanced security, monitoring, and effectiveness in application and funding processing for student mobility in the scope of the Linnaeus-Palme exchange program.

7. REFERENCES

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8. AUTHORS' BIOGRAPHIES

Fei S. Roth holds a B.A. in English sociolinguistics and computer science obtained at the University of Gothenburg in 2014. She is a senior systems developer working at the Swedish Council for Higher Education. Previous work experience gathered at the University of Gothenburg 2012-2017 comprises participation in minor and major international and national projects such as DASISH, DwB - Data without Boundaries, ARIADNE, and Making Nordic Health Data Visible.

Fei's major interests lie in solid and agile software development, machine learning, AI, big, open and linked data, metadata harvesting as well as research data curation, dissemination, and long-term preservation.

Reijo Soréus has been working at the Swedish Council for Higher Education as a technical application manager of the national Swedish admissions system for higher education since 2013 and has recently been appointed IT Architect at the Department for Systems Management and Operations. Previous experience includes technical application management of the Swedish national SIS Ladok and managing the technical sub-project of Ladok3 as well as application management at Ericsson Radio Systems.

Reijo holds an MSc in Engineering from the Royal Institute of Technology, KTH.