# Peppi consortium

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## 1. ABSTRACT

This paper explains how and why  Metropolia University of applied sciences and Tampere University of applied sciences extended their collaboration from Peppi project to a national consortium. The project itself followed open source principles from the beginning so it was a natural continuation to share the results with other higher education institutes as well as open the door for new vendors. In the paper we describe what kind of challenges developing information systems have nationally and why collaboration and interoperability are so important in information system development.

During the consortium process we encountered some challenges due to earlier decisions that were made. Initially we didn't have any idea that we would extend the project to a consortium. These challenges are explained in the paper as well as the solutions that we ended up with. The consortium model that we use is new in Finland there are still lessons to be learned. Currently, the consortium is up and running and the future looks bright.

## 2. INTRODUCTION

Peppi (pronounced peppy) consortium was founded after Peppi-project. The Peppi project was started in 2010 and the objective was to create next-generation software ecosystem for Higher Education Institution (HEI) education management and planning. The goal was to create ecosystem by the principles of service oriented architecture using open source technology. Estimated duration for the project was four years including over 80 project members and a budget of over 2,5 million euros. The project would have been too big for only one HEI. Helsinki Metropolia University of Applied sciences and Tampere University of Applied sciences made a decision to cooperate and signed cooperation agreement to manage the project. By doing this both Universities were able to set higher goals to the project by sharing the expenses. In 2010 there were already signs of cutbacks of University financing in Finland for the future and it was necessary to start the project in cooperation.

Project achieved its goals ahead of schedule and stayed within the budget. Both HEIs are using Peppi ecosystem in production today and it has completely replaced several systems. Replaced systems included old Enterprise resource planning (ERP) system, room reservation system, course planning system, curriculum planning system and various integrations. This has made maintenance easier and lowered maintenance costs dramatically.

## 3. PEPPI AND OPEN SOURCE

The Finnish government has made recommendations that data from the public organizations should be opened for everyone. Already in the development phase of Peppi-project all the documentation was public for anyone to see. People from participating HEI's and also the vendor were contributing to the making of system requirements simultaneously and in public. This open-source thinking from the beginning made it easier to continue using the same principles in the next phase which was to expand the collaboration with additional educational institutions. This would be done in the form of a consortium. Furthermore Peppi made it possible to open data in computer readable format freely available for everyone to use and republish as they wish.

## 4. CHALLENGES TO DEVELOP INFORMATION SYSTEMS

In this chapter we have collected some challenges that we encountered during the Peppi-project and the consortium.

### 4.1 Funding and dividing the costs

One of the basic challenges in cooperative projects is how to divide costs between organizations. There are at least two different models how to do this. One solution is to establish a joint venture in which collaborative organizations invest capital beforehand or they agree on the terms of how the future funding is divided. The joint venture then takes care of everything that the developed information system needs to be finished / maintained. The joint venture or in-house corporation can then extend by accepting more shareholders (other organizations) which gives them right to use the system. The other solution is to create a consortium which is legitimately more lightweight but needs thoroughly planned rules to work. These rules include principles how the funding and costs are divided between participating organizations in the development phase as well as in the maintenance phase. In our case these principles are based on the amount of full-time students (in HEI's) and annual turnover related to education business-area (used in case of other vendors with private companies).

### 4.2 Collaboration

When creating an information system for multiple organizations it's necessary to specify and benchmark business processes in the early stage of the development. In Peppi's case all the basic business processes were relatively similar within organizations but we encountered slight differences in some of the processes. These variations emerged also within the same organization's different business units. When these variations are recognised they should be investigated - could these processes be merged so that the system needs to support only one process variation instead of many. These decisions lower the cost of development as well as simplify the overall system.

True problems occur when organizations cannot agree on some processes or functions that the system should support. In that case it is necessary that the consortium rules define the decision order - who is authorized to make the final decision on how to proceed. Otherwise the overall system development can encounter a dead-end which then creates more costs and extends the project schedule.

### 4.3 Government set recommendations for public sector acquisitions

One fundamental question in cooperative projects and consortium model is that who owns the rights for the collaboratively created product. The rights can be seen from three angles: 1. *Intellectual property rights* (IPR) 2. *commercial rights* and 3. *ownership*. The IPR normally belongs to the supplier that has produced the actual code for the product (software  or certain part of the software). Traditionally the same supplier owns also the commercial rights and the customer only gets the perpetual right to use the product. This is problematic if the customers (consortium) aims for expanding the usage of the product.

So how did we end up with this problem. The Finnish government has set some recommendations for public sector on how to publicly ask for bids for providing services. These recommendations define among other things: *"Unless otherwise agreed, copyright and other intellectual property rights in the customized application and the related documentation remain with the supplier or relevant third party"*. In the consortium where the product is still being developed this term could be a major drawback. It claims that all the rights are on the suppliers side, not in the customer's side who has funded all the development as well as contributed extensively on the development and improvements of the products. In order to success with the extension of the consortium it is crucial that the rights belong to the consortium itself. Otherwise the consortium could end up in the court for violating the agreed terms.

Solution, the original supplier of Peppi software decided to give away their commercial rights in Finnish educational market in favor of the consortium. Thus, the consortium can expand and sell the product without violating any rights or being subject to changes to licensing policies. The commercial rights only exist as long as the consortium also exists and these rights cannot be transferred or revoked. With this model the wellbeing of the consortium is a key interest of every member of the consortium as it provides the true return on the investment.

## 4.4 Information systems interoperability

Finnish government and the Ministry of Finance has set goal for national systems interoperability. The main cause of this initiative was the lack of cooperation when creating information systems and the lack of common principles and architecture on how the systems should support integration and standard interfaces. The same challenges can also be seen in education sector information systems. Common structures, definitions and concepts were also lacking. To solve these issues the Ministry of Education and culture in Finland started the RAKETTI-project.

By creating Peppi consortium we think that the best way is to commit members to create and develop information systems together with vendors on equal terms to achieve the aforementioned goals.

## 4.5 From project to a consortium

In this consortium, the major challenge for us was how to define different roles, responsibilities and rules for the consortium. The challenge was that we did not plan the consortium in the project implementation phase, instead the idea of a consortium emerged after the system was already in use. It meant that we had a normal project organization structure which did not have any practices or rules in order to support the expansion of the system use. The actual consortium structure that we ended up with is explained more thoroughly later on in this paper.

## 5. WHY A CONSORTIUM - THE DAWN OF COOPERATION

The economical situation in Finland as well as in the whole Europe has lead to a situation where funding has declined dramatically. This means that HEI's need to find new ways to provide same or even better IT-services with less money. Our solution to this challenge was to establish a consortium that offers some of the needed IT-solutions with shared development costs.

The basic idea in our consortium is that new HEI's and additional vendors can join in with minimal costs and the future development of the system is funded through annual fees gathered from the new participants. This means that we are not aiming to cover initial development costs of the system but only the further development. In addition, we are also aiming to acquire more vendors to participate in the development. The Peppi-system itself covers already most of the necessary functions of study planning processes but there are still several desired functions and processes to be covered. Consortium exists to give rules and guidelines for the technical development work as well as to govern and coordinate the development efforts. Our guiding principle was that the software development work must comply with the standards set in the Peppi project and that the consortium needs to enforce this. This guarantees better continuity as well as keeps the development costs low from the perspective of one member.

Consortium model in general is not a new idea in Finland. Previously the has been same kind of consortiums between Finnish universities like Oodi-consortium. In addition there are examples in other countries like Kuali in the US and LADOK in Sweden. We investigated these consortium models and took all the best bits of them and created a new one.

## 6. THE PEPPI CONSORTIUM

Peppi consortium is open for any educational institutions and commercial vendors. Consortium's mission and objective is to develop systems for education, teaching and management purposes and offer development rights to the members of consortium. The aim is to enhance current systems and create more systems for the consortium. By joining to consortium the educational organisation obtain rights to use systems included in Peppi consortium.

Decision making in Peppi consortium is done by the board of the consortium. Chairman of the consortium board has the final decision option. Contextual workgroup includes members from educational institutions and founding members. Their assignment is to elaborate on the development roadmap for the Peppi software components and propose development plans to board of consortium. Technical workgroup is responsible for the architecture and technological principles of Peppi systems portfolio. They present plans and roadmaps for board decisionmaking.

The fundamental principle is the technical environment consistency. The consortium is responsible for the development environment up-to-date and requires that new services comply with the specified technical architecture. All technical solutions are based on open source products. The consortium technical team is responsible for architecture reforms.

The content group determines development needs of the existing services and  prioritzing the development needs of the new services. The actual development takes place in separate projects of the consortium or by the members in their own projects.
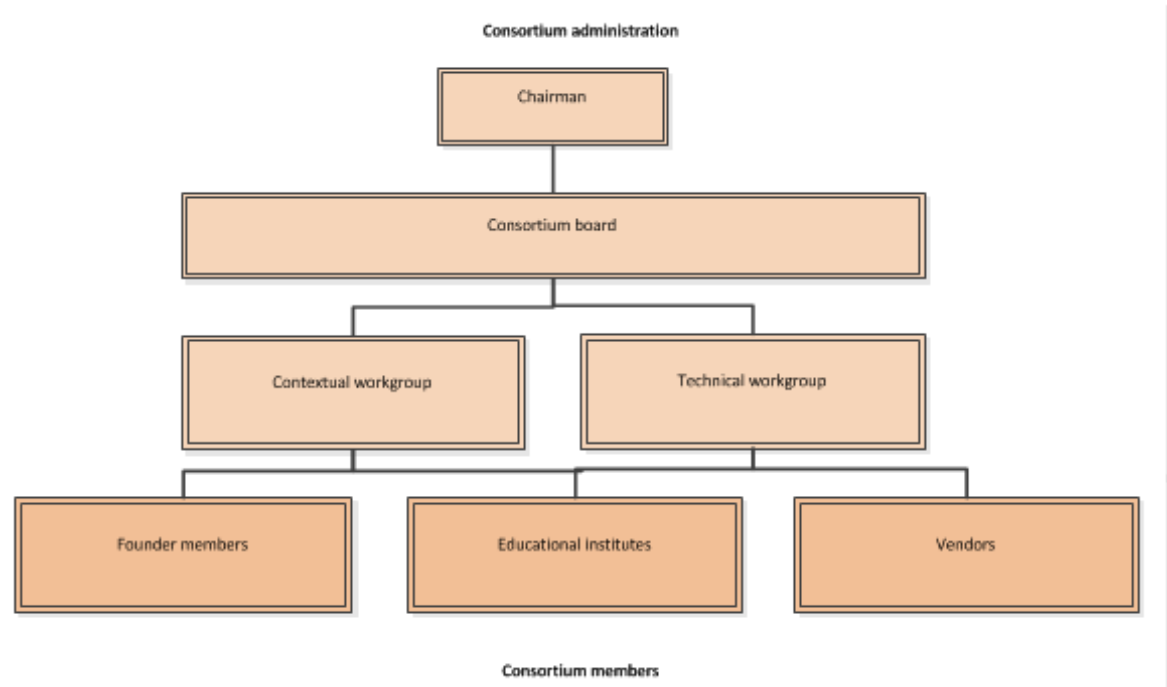
**Figure 1. Consortium's organisation hierarchy**

## 7. CONSORTIUM TODAY

At the moment the consortium is on the verge of delivery. Within the first 6 months the consortium has acquired 4 new members. Calculated number of students included in Peppi consortium is over 37 000.

Over 25 000 users are already using Peppi services in production. Peppi services have also accumulated many plugin services using Peppi's open service interfaces. The study guide used in Helsinki Metropolia University of Applied Sciences is using only Peppi's service interfaces. As a proof of excellence of study guide, Metropolia acquired ECTS label in 2013. Plugin portfolio also contains mobile service for students (Nominee for best mobile service in Finland 2013 competition) and integration services to various 3. party systems (ie. Identity services, HR-systems, Student administration system).

## 8. FOR THE FUTURE

The future of the consortium looks good. More and more members are joining in from both educational institutes and vendors side. The cost model used in the consortium seems to be attractive enough to ease up the decision making, whether to join in or not. The expanding bring also new challenges as described earlier. How to cope with the increasing improvement requests and which new system functions are generic enough to be included in the consortium.

The future initiatives includes making consortium web pages, common development environment and improving the documentation for consortium members. Not to forget it's main goal which is creating new and enhancing existing information systems to the members. The ambition of the consortium is to enlarge its membership base in the coming years so that the true benefits of developing together could be achieved. The journey of a newborn consortium has starting to take first steps. Already we have seen the strength and potentiality of Peppi, it's architecture and belief toward the consortium. And we believe that we haven't seen it all yet…

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# 10. AUTHORS' BIOGRAPHIES

Tuomas Orama works as development manager and is the head of the development unit in Metropolia University of Applied Sciences in Helsinki, Finland. He graduated as an industrial designer from Kuopio Academy of Design. He has studied also in Institute of Design and Fine Arts in Lahti university of applied sciences and in università per stranieri di Perugia. His work experience includes dozens of IT-projects for more than a decade. He has worked in several expert positions in national IT-projects in HE-level.

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