Smart Industry | Business IT | Transformative Learning

Sariseelia Sore & Ulla Kotonen (eds.)

Lahti UAS ICT Projects 2015

Lahti University of Applied Sciences
Lahti 2015

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Preface

Digitalisation plays an increasingly important role in everything, from people's personal lives to business. Finland urgently needs digitalisation experts both in the technical field and in business applications.

The Lahti UAS Degree Programme in Business Information Technology is aimed at preparing students for future expert roles in the agile development and utilisation of digital services. Project skills are at the core of this programme. The pedagogical approach is built on project-based learning: nearly all contents are delivered in the form of modules, each comprising two theoretically oriented courses and a project in which students apply the acquired knowledge. The programme also offers opportunities for applying problem-based learning in industry-based projects. Industry-based studies enable students to integrate knowledge into practice and develop their critical thinking and problem-solving skills in authentic workplace contexts. This way, learning takes place not only by memorising information but also by exploring and resolving topical industry-specific problems.

The programme includes a compulsory workplace-based project module, carrying 15 ECTS credits. The module is scheduled towards the latter stage of the programme so as to allow students to apply and integrate the knowledge learned during the studies in genuine workplace challenges. Although students tend to find this a demanding module, it is also often cited as one of the best from the learning perspective. For students, resolving topical real-world workplace problems has proven a meaningful way to build diverse skills sets.

This publication provides an overview of the current state and future outlook of the project studies at Lahti UAS and presents students' outputs from spring 2015. It also includes contributions by regional development manager Juha Hertsi from the Regional Council of Päijät-Häme, who presents the industry's views on collaboration projects, and principal lecturer Lasse Seppänen from the Degree Programme in Business Information Technology of HAMK (Häme University of Applied Sciences), who discusses HAMK's experiences with workplace-based projects.

We are extremely grateful to all who contributed to this, the first Lahti UAS ICT Projects review. We have a lot of ideas for the development of the publication and hope to incorporate them in next year's issue.

Lahti, 3 October 2015

Sariseelia Sore
Senior Lecturer, Coordinator of Education
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Juha Hertsi

Fluid co-operation in projects

The Regional Council of Päijät-Häme has been carrying out co-operative projects with the Lahti University of Applied Sciences for the purpose of testing student skill sets and motivation for several years now.

Figure 1. Juha Hertsi, Regional Development Manager, The Council of Päijät-Häme.

The Regional Council of Päijät-Häme is an inter-municipal concern, owned by the 11 municipalities in the region. The council has two legally deemed main functions, which are regional development and planning. Aside from these, the council also has two other regional interest functions, international operations and the execution of EU structural funding programmes for the purpose of abetting regional competitiveness and welfare. The personnel level has fluctuated over the last few years between 20 and 30 persons, not including the 200 or so employees of the separate Päijät-Häme Rescue Squad.

In regard to the development of the region's competitiveness and welfare, it is essential that we develop regional skill sets and networks. Several years ago, when we first actively embarked on co-operating with a student project of the University of Applied Sciences, there were three major perspectives of influence:

- The council had scant public resources for experimentation and spearheading of service development.
- Contact and interplay with the young are vital in keeping up-to-date and in recognising innovative solutions.
- We wanted to offer an interesting platform for the projects being carried out by students of the Lahti University of Applied Sciences.

The majority of the student projects which have been carried out have been in connection with the development of ICT service platforms for internal and external utilisation by the Regional Council of Päijät-Häme or even for gaining maximum benefit from the newest dimensions in social media. From the start, we, and the projects our council has offered, have been very well received by the student groups. Over the years, the management of these projects has grown ever more precise, and whatever delays there have been were usually caused by the union's own requirement alterations along the way. It's probably a positive factor that the students get used to the idea that, in spite of good preliminary planning, changes along the way will bring new dimensions to a project. Project meetings have been in English, when necessary, though the final products themselves have been almost exclusively Finnish. We did experiment with creating a www-site about the region in Chinese, which did in fact receive a lot of hits from China.

In addition to the projects, we have been able to offer some work-practice placements or placement in the organisation for and during the writing of a thesis. We still have professional contacts with several of the graduates. Just a few weeks ago, we purchased the services of one of the graduates who had worked on one of these projects.

Our experiences with the ICT projects carried out by the Lahti UAS students have been very positive. We recommend this type of project co-operation to other firms and organisations, both in the public and the private sectors, whenever they have any interest in developing their own skill-sets or services and a desire to offer young people the opportunity to be involved in an interesting and educational vocational project.

Antti Salopuro

Project activities of BIT programmes 2015

The curricula of Business Information Technology programmes (BIT) of Lahti University of Applied Sciences (Lahti UAS) are built based on careful analysis of the needs of the local employees. These curricula are designed to mix topics of both business and information technology aiming to, already at an early stage of the studies, endow the graduates with sufficient knowledge of both of these fields. At the phase of professional studies, a student may relatively freely select the path of specialisation. One student can focus solely on business studies, a second one on, perhaps, programming, and a third one finds it useful to build an appropriate combination of these two. (Lahti University of Applied Sciences, 2014)

Despite the selected focus of substance, each BIT student's personal curriculum includes many practical project courses where the learned subjects are applied, working on either a real customer problem or a simulated case. This starts already in the very first semester. During the first autumn, all students attend a project where they learn some basic team work skills as they need to mutually collect and process information new to them. In the second semester, the students create a small web application. Finally, in the third semester, finishing the basic studies phase, a full-scale desktop application with database is created.

Figure 1. Project work is team work (photo: Antti Salopuro).

Projects will continue during the professional studies in almost every module, such that each student will, during the studies, take five to seven different project courses. The project course most visible to companies and other organisations outside LAHTI UAS is the ICT project (8 ECTS), which, together with courses Practices in Information Systems Development (3 ECTS) and Project Management English (4 ECTS) forms some sort of grand finale for the series. This module simulates a real-life project in many ways, including a real paying customer with a real problem to be solved, a steering group activity, formal communication and limited time, technology and financial resources. The students shall also write a formal job application with a CV in order to be accepted into the course.

The objective of these project works is multifaceted. Firstly, these project courses deepen the substance knowledge and skills. Tasks that have not necessarily been designed by the limited imagination of the teacher must be solved with the existing and even some new skills. Secondly, they provide a realistic environment where the connection between different individual topics is best visualised. It is not unusual to hear during the project work that it was the first time a student learned how design and implementation phases, for example, connect to each other. Thirdly, the project courses develop meta skills of the students. Time management, team work, communication, foreign languages and responsibility are good examples of these meta skills that are learned and applied during the various projects.

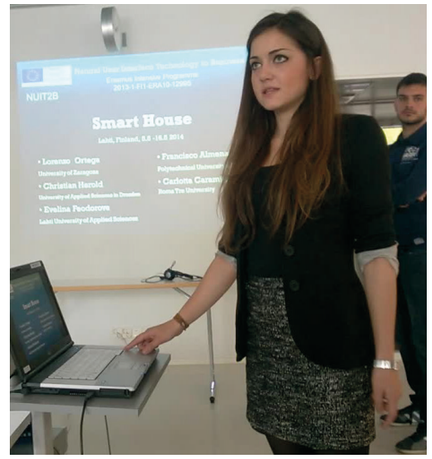

Figure 2. Projects develop many meta skills, such as presentation skills. Student Carlotta Caramia, from University of Roma TRE, Italy, presenting during the 2014 NUIT2B intensive programme course (photo: Antti Salopuro).

Project courses and other projects

During the academic year 2014 – 2015, there were altogether 6 project courses offered to students. In addition to the already-mentioned Green ICT Project 1- 3 and the ICT Project, courses such as Agile Web Application Project (5 ECTS) and Practical eBusiness Development (5 ECTS) with practical team work were also provided. Several other courses also included projects as part of their implementation. An example of such a project is the implementation of a fully functional web shop for a real customer in the course Verkkokaupparatkaisut.

The Green ICT Project 1 is the first project course the students of BIT programmes do in their first autumn semester. This year, autumn 2014, the topic was to study and prepare a full report with a group presentation of energy consumption in a regular student apartment. In addition to searching information from various sources, the students had to critically assess their own behaviour as energy consumers.

In the Green ICT Project 2, during spring 2015, the first-year students worked in small groups to develop a web application, which could be used to estimate required energy for keeping a household warm. This application would fetch the current weather forecast from some external weather service application for a given location and calculate the estimation from volume and energy consumption classification of the house for a selected day. In addition to the implementation of the application, the student groups also set up and maintained a web server for the application.

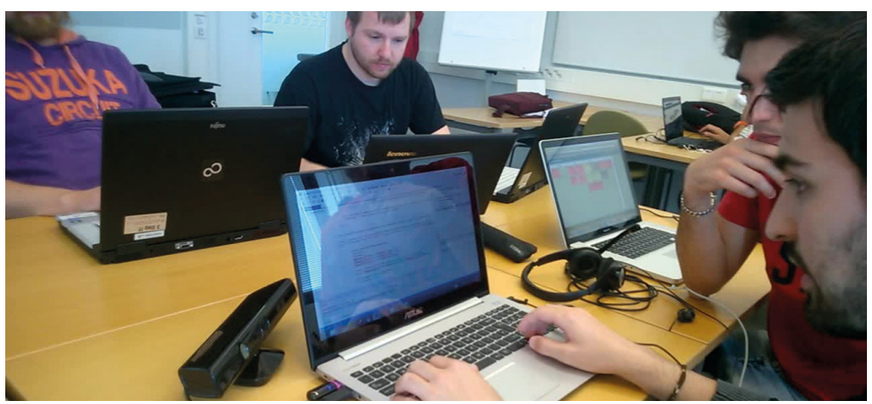

Figure 3. Lahti UAS BIT programmes have also implemented projects as intensive courses. NUIT2B organised 2014 in Lahti developed applications for natural user interfaces, such as gesture recognition (photo: Antti Salopuro).

The Green ICT Project 3, the last project course of the basic studies phase in the second-year autumn semester, involved creation of a desktop application that uses a database. The tasks given varied between the course implementations, but one of them deserves to be mentioned specifically. The developed software, a system to help in creating a shopping list, became public both locally and nationally as radio and newspapers reported about it (Ojajärvi, 2015) (Koskinen, 2015). The idea of the system was to keep track of the food item storage of a household and, according to the made meal plan, calculate and output a list of missing food items as a shopping list. As the meal plan is implemented (i.e. food is cooked) the system should automatically reduce the appropriate amount of used items from the balance sheet. This system will be further developed to as a web application on future project courses of BIT programmes.

In the course Agile Web Application Development, the project teams applied an agile method for development of a web-based Kanban tool. This project associated web application development and software testing skills to agile project methodology in designing and implementing a graphical tool to monitor and control a similar project. A Kanban tool, Kanboard, was also applied in the process control of the project, providing students a diverse viewpoint to the methodology and the given task. During the project, the supervising teachers, Heikki Paananen and Antti Salopuro also developed and described a practical process applicable in any student group work (Paananen & Salopuro, 2015).

The course Practical eBusiness Development involved practical individual or team work around a topic related to either eBusiness or eCommerce. The tasks were defined by the students according to their own interest. Examples of these projects are implementation of a web shop and comparison of different web shop platforms. In the course Verkkokaupparatkaisut, similar projects were done to implement web shops, applying different web shop software such as Open Cart, PrestaShop, Magento Community edition, Zen Cart, osCommerce and Clover Shop. One group also implemented a real web shop for an external client, Finnish Spitz Organization. The web shop has not yet been published but will be in the near future. This project was related to another project in the ICT Project course, where students completely renewed the existing web site.

This ICT Project course is, as mentioned, a final test to students' project skills before their graduation and transfer to working life. This year, there were 6 different project teams whose project topics were many, including technology research, business idea development and tailored applications supporting business. All six of these projects were bespoken by a client external to the BIT programmes for providing a solution to a real existing problem. The autumn implementation employed one group which made a technology research of open badges partially leading to the ICT Project Master programme reported in this publication. All five spring implementation projects are documented in this booklet, each as a separate project report.

Figure 4. Teemu Himanen, Tatu Lahdelma, Sara Kumpulainen and Dai Si received the award for the best ICT Project 2014 – 2015 (photo: Bao Nguyen).

New practices developed for project courses

The academic year 2014 – 2015 has seen active development of new practices to be applied in project courses and their coordination.

Firstly, development of a practical method using an existing tool, Kanboard, for project management and evaluation of individual work done in teams, was carried out during autumn semester 2014. Lecturers Heikki Paananen and Antti Salopuro applied the tool in the project course Agile Web Application Project. The experience and developed process was described and presented in the ITK2015 conference in spring 2015 in Aulanko, Hämeenlinna (Paananen & Salopuro, 2015). The developed method was also applied during the spring semester implementation of the ICT Project course. This project, the applied method tool and the development results are further described later in this publication by Heikki Paananen.

Secondly, a method for motivating students to experiment project roles outside their comfort areas was developed. This programme, ICT Project Master, is based on open badge technology and was developed as a solution for a specific need recognised earlier. The method, and some experience from the first implementation, is described further in the next article of this publication.

Thirdly, the project teams of the ICT Project course implementations were motivated to strive for better quality by announcing an award to be given to the best project work done during the academic year. This announcement was made in the beginning of the project course. During the process, this seemed to work as it was designed; the teams would actively try to work as well as possible. Communication and reporting of the project teams were seemingly better than during the previous years, and the expected award was also mentioned a few times in the discussions with the teams. Eventually, at the final seminar of the ICT Project course, the project team that implemented a safety plan for regional organisation PHL was awarded. This award also went public and caught a lot of interest (Salopuro & Ojajärvi, 2015).

Future of the projects

During the past few years, the project courses have increased their significance in BIT curricula. Development of new methodology for project management and identification of individual work within the teams have improved the possibilities to better supervise and coordinate team work in general. Different process models have been learned by the teachers, and this knowledge has been utilised in project courses. Also, methods to motivate the students to put better effort into team work have been utilised. ICT Project Master badges support the student in experiencing many different project roles. The Kanboard tool, while making the individual work visible for all, is supposed to reduce free riding in projects. Moreover, the possibility of giving public acknowledgement to the best project work has increased the willingness of students to aim at good quality.

In the future, the role of the project courses will be increasingly strengthened. The objectives in developing the meta skills will be more clearly written in the curriculum. For this, a specific study path for an ICT project professional will be described. This study path will include a list of certain project courses, but also utilise the ICT Project Master badges to recognise the experienced project roles during them. The study path and its specification will also be clearly communicated, both inside and outside the University, such that potential applicants are familiar with this possibility. Writing this, until now hidden, curriculum down should also strengthen the self-awareness of the faculty personnel and current students as well. Giving names to meta skills, recognising them and their level in oneself and creating an active plan for their development (in addition to the substance), strongly supports the student being not just aware but also confident of one's skills. At the time of graduation, confidence of one's skills is an asset that every student should have.

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Antti Salopuro

ICT Project Master Badges - Encouraging students to take different project roles and enabling them to publicly show their achievements in student projects

As described in the previous article, Business Information Technology programmes of Lahti University of Applied Sciences (LahtiI UAS) include various project courses throughout the studies, from the first semester to the graduation phase. Usually, the project courses are organised in modules, together with two or three substance courses, such as programming and databases. The fundamental idea is to provide theoretical information and classroom exercises on the substance courses of the module and utilise and deepen the gained knowledge and skills of the project course which requires the usage of these new skills.

Figure 1. ICT projects start with project planning and design tasks (photo: Antti Salopuro).

In addition to offering the possibility to apply the new skills, the project courses also have another objective. In professions targeted by the students in this field, the work is very often done in projects. Project work demands many different types of meta skills, including, for example, communication, managing, task prioritisation and learning, just to mention a few. These meta skills are developed by trial

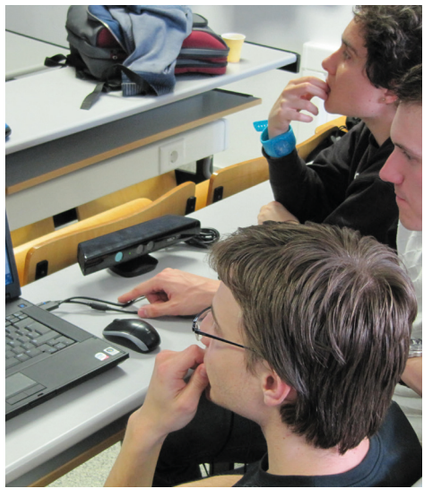

Figure 2-3. Development and testing are also typical tasks of ICT projects (photos: Antti Salopuro).

and error -which requires practical work- and concrete participation, rather than by reading from a book or by following a lecture. Different project roles, however, give a different viewpoint to the work in the making and also develop different meta skills. Therefore, it is beneficial to the student to have the possibility to try many of these different roles during the studies.

Humans are not, by nature, always willing to step into a field where they do not feel comfortable, and students are not an exception to this. A technically skilled student usually likes to be the programmer of the project, and a socially skilled or a student used to organising things would more likely wish to manage the projects. Student projects, even though they are sometimes done for a real paying customer, are perhaps the last safe environment where failures and errors can be made without any impact on one's future career, even temporarily. Knowing this, collecting the experience in various roles at this stage may be the only possibility the student ever gets or is willing to take part in.

This article describes a novel approach for motivating students to take different responsibilities in student projects they attend during their studies.

Publicity for project work with open badges

To motivate students to try project roles they do not naturally feel comfortable with, an incentive was required. The first idea was to collect detailed information from the projects and the roles in them individually for each student in a separate register. At graduation, together with the degree diploma, a separate certificate, which lists the participated projects and student roles in those, would be presented. This would have been a certificate that the graduated student could attach to her CV. This certificate would only be earned if the student had taken, for example, four different roles during the project courses.

The idea was tested and developed a bit further, but it soon raised some concern of generating too much extra work for the project supervisor. Also, a completely new project/student register would have had to be implemented, and, even though the implementation could have been organised as a student project, and therefore would not have been a problem, its maintenance in the long run would most probably have been extra work. Extra registers need to be installed somewhere, and one person needs to be assigned to look after it. Registers containing personal information are also strictly regulated by Finnish law. This would have already been too much, since these kinds of extra work resources are not available in general.

To avoid the need to keep a register, another solution was suggested to let the student collect separate certificates or tickets from each attended project. These certificates could then be returned to a supervising teacher before graduation, such that a formal certificate could be written only if the required amount of different roles were fulfilled. This solution also had its difficulties; the student would have to save and collect the tickets for years, and again, writing the tickets and certificates would require extra work from the teacher.

Figure 4. Visual implementation of the ICT Project Master badge.

A feasible solution to the problem was suggested during another student project, where the suitability of different digital badges would recognise the skills and achievements publicly. The client of this project was the Teaching Technology Services of LAHTI UAS, and the goal was to compare different technical implementations and their suitability for use in recognising student and personnel achievements other than those acknowledged in the final diploma. The purpose and mechanism

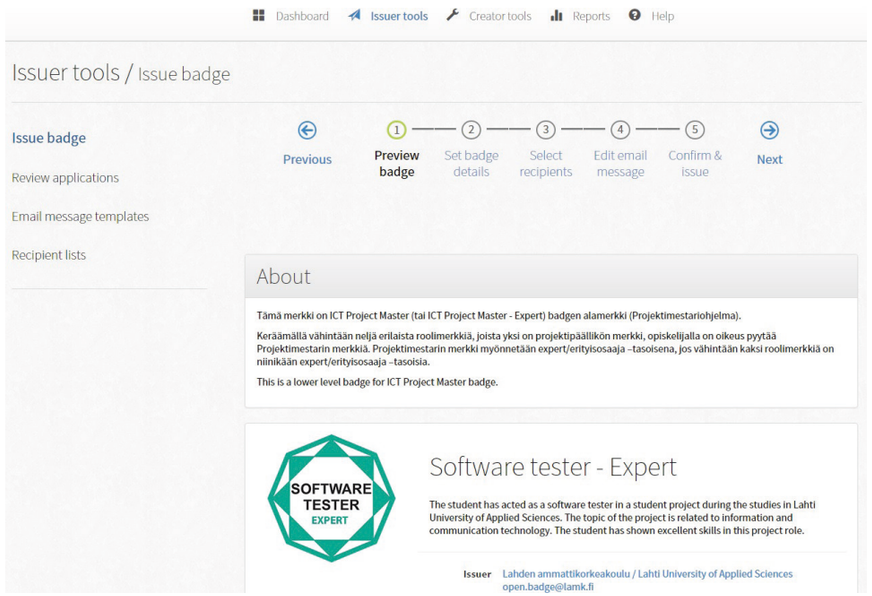

Figure 5. Issuing an open badge with the Open Badge Factory requires only five simple steps from a teacher.

of these digital badges was seen to be a perfect match with the problem at hand. In this solution, the certificates would still be collected by the student, but as their format would be digital, the process to grant new certificates could be very much automated. Moreover, the student could store the received certificates in a digital backpack provided by an external service provider. One more benefit that supported this solution was that the student would now be able to publish the received acknowledgements in her digital CV and social network profiles. The validity of the certificates would still be possible to be verified by, for example, a potential employer of the student.

System implementation

In the student project, three different systems were selected for comparison. These included an integration to the learning Moodle used at LAHTI UAS, an Open Badge Factory and a Mozilla Badgekit. The comparison was carried out using a scoring matrix and weighted scores. The features compared in the matrix were generated from the list produced by the client for the functional and technical requirements of the system. The weights were set, subject to the importance of the feature as seen by the client, and the scores, on a scale of 0 – 5, were set by the evaluators as a subjective opinion on the availability and quality of the implementation of the corresponding feature in the evaluated system.

The project group suggested that the Open Badge Factory would be chosen to be implemented at LAHTI UAS. This solution met the most requirements listed, and of those that were missing, many were expected to be released soon. In general, the Open Badge Factory was evaluated as easy to use and customisable. It seemed to be actively maintained, now and also in the future.

The system was deployed and the individual badges were graphically designed by the Teaching Technology Services of LAHTI UAS. All teachers in the Monitori – programmes (Business Information Technology, Information and Communication Technology) of LAHTI UAS participated in making a list and describing the different project roles that would be acknowledged in the programme. These descriptions were connected to the graphical badges in the system and the templates to be used in the issuing process were generated. These templates allow the issuer (teacher) to pick the desired role badge from the library, add in to the list of emails to students that have earned the corresponding role badge and mass post the badges with just a few mouse clicks. The student will receive an email about the grant badge and is free to accept it, store in a backpack and publish it. The student may use any available storage for the badges, but the Open Badge Passport service is recommended.

Rules and roles

The process to apply and collect role badges has been agreed on between the teachers of the Monitori programmes. It has been designed such that as much responsibility as possible is left to the student about application, confirmation and reception of the badges.

Firstly, the rules have been explicitly recorded and are communicated at the start of each project course by the supervising teacher to the students. The student or a group that is willing to apply for such badges in the end of the project must, after organising themselves as a group, specify the aimed main roles of each member and also specify those documents or other results that will be produced by the role responsible during the project and that can be evaluated by the teacher in the end.

For example, a student chosen to work as a software tester of a project may specify that during the project, certain levels of test plans are produced, the corresponding tests are executed, incident reports are delivered and finally test reports are written. This specification is addressed to the teacher, who may, if necessary, demand some additional outcome from the student to fulfil the role expectations

before accepting the plan. It is natural for the student responsibilities to go beyond the main role, and these responsibilities must, of course, also be fulfilled, but they need not be listed in the role specification.

During the project, each student must take care of fulfilling all the commitments that were promised in the initial specification.

Once the project is finished and has been reported, the student group should provide the teacher with all the deliverables promised in the role specification. For the teacher, it is now possible to verify if all planned activities have been carried out by comparing the plan and the existing documents or other outcomes. If everything corresponds to the plan, the teacher will proceed to issue the corresponding badge to the student by using the tool and template described in the previous chapter.

Currently there exist 9 different project roles specified in this programme that a student may apply for:

- Project manager
- Programmer
- Tester
- User interface designer
- Project document writer
- Software designer
- Database designer
- Data network specialist
- Subject matter expert.

Each of these roles is defined in a written specification, which consists of a short general description of the role and a list of criteria required to earn the badge. These definitions are attached as a link to the role badge as a student receives one. Authenticity is guaranteed by the issuer, and the email address and organisation website of the teacher are attached to the badge, so that any one that wishes to verify the authenticity of the badge can do so.

For example, the definition for the Tester role is:

Description: The student has acted as a software tester in a student project during the studies in Lahti University of Applied Sciences. The topic of the project is related to information technology.

The criteria part for the same role of Tester is:

The student has participated in a student project in the Monitori programmes (Business Information Technology and Information Technology) of Lahti University of Applied Sciences and acted as a software tester in it. The project team consisted of students and the project task was related to information technology. A software tester has the main responsibility over the test-related activities of the project, including systematic and documented test planning, implementation of the plan and reporting the test results. A software tester also participates in the software development process in all of its phases and generally in project work and meetings as a team member. A software tester reports the work results to the programmer, project manager, client and supervisor.

Each single project may earn the student one new role badge. The motivation to collect as many different roles as possible is increased by a specific ICT Project Master badge. A student may apply this badge if and only if the student has collected at least four different role badges and one of these badges is a Project Manager role badge. In this case, the student simply collects the links to these roles badges together and sends an application to the teacher via email. The teacher issues the Master badge after the validity and authenticity of the role badges is verified.

In the case where the student has performed in the specified role at an excellent level, the teacher may grant the role badge as an expert level. By mutual agreement between the teachers, it has been specified that this means that the student grade must be the highest (5) on the applied scale 0 – 5 of LAHTI UAS programmes. If the student manages to collect two expert-level badges from different roles and is also otherwise eligible for it the ICT Project Master badge, an expert-level badge is also granted.

First experience

As described above, the system and process for issuing ICT Project Master role badges has been implemented in the Monitori –programmes of LAHTI UAS. The first role badges were issued at the end of the spring semester 2015 for students that attended the courses of the Green ICT Systems Project (Monitori -module) or the ICT Project (of IT/BIT programmes). The first experience implies that those student groups and individuals that felt they succeeded in the project were more willing to apply for this acknowledgement. It is important to note that not all students were at all interested in applying. So far, there is no evidence or studies made about these groups, but a hypothesis is drawn that students who did not feel they had fulfilled the given criteria of any specific role did not eventually apply. For example, if there was no evidence (e.g. documents) to show that the role was fulfilled, the student did not even bother to apply.

This hypothesis is an interesting one to be tested in future projects. If it is supported by the feedback from the students, it, on one hand, is a sign of success of this programme, in the sense that the determined students who know what they are doing do apply and get this reward. On the other hand, it would imply that the students who do not feel comfortable in the chosen, or even in any specific, project role may suffer from a lack of self-confidence. For those individuals, this programme could work as an indication of a specific need of support and encouragement.

Now, after being introduced, the ICT Project Master programme will continue as promised for the students of the first pilot semester. It is now expected that each semester hundreds of ICT project role badges are issued and that the first ICT Project Master badges would be awarded during the year 2016. It will be interesting to see how this programme will carry on and how eager the students are in aiming to earn these acknowledgements, and further, how often they will be attached to, for example, job applications of the graduated students.

Heikki Paananen

Visualising work with Kanban in school projects

During the academic year 2014 – 2015, teachers Heikki Paananen and Antti Salopuro seized to tackle the continuous challenge in coordinating, supporting and grading the large student projects. The challenge was the following: how to prevent students from slipping and dropping out of the agreed project tasks and deadlines. Especially in longer software projects, it is very difficult to see the progress of a project – in intermediate checkpoints, the students traditionally present what they have accomplished, but in many cases, it remains unclear if they are still on the agreed timetable with the agreed content. Software projects are abstract by nature – it creates challenges for nearly every project. The situation is even more problematic when trying to analyse the individual performances within a project team.

Visual management

In order to tackle the problem, the teachers started to seek possibilities to create a visualised work model, which could make the team's tasks and statuses visible, as well as to more clearly see who is doing what task. The idea for visualising the work is coming from Lean Manufacturing and visual signal systems. According to Ortiz et al. (2011), visual signals have traditionally given a faster and more precise way to communicate in a small group. By utilising simple graphical elements and simple process flows, it is possible to ensure that a message is quickly delivered and understood (e.g. traffic lights).

Kanban method

In software projects, outcomes (in most cases) are quite intangible; thus, intermediate steps require that teams would know where they stand with their tasks. According to Hefley (2015), this is possible by utilising Visual Management and Agile work methods in a team's work. With this work model, a project's objectives are sliced into tasks. Slicing of tasks and setting of the amount of tasks for a period of time, including each task's work estimations, are done by the development team – the customer only creates prioritisation for the functionalities he/she wants to be developed next, and by doing so, affects only what the team is doing, not how much or how. All these tasks are put into a board called the "Kanban board" (see figure 1).

In the simplest case, there can exist three columns in which the team can put all tasks needed for the project. Of course, depending on the difficulty of the project, there can be more precise columns to illustrate the phase of the work process. In our school software projects, the following columns existed: "Project plan", "Current period", "Work in progress", and "Done" as displayed in the figure on the side.

The goal for bringing the work process and tasks for the team is simply to increase and quicken the communication between team members. Everyone on the team is able to see who is doing what and what work we have left before the deadline. The Kanban board needs to be used in every team meeting as a backbone for discussion about situations and upcoming work items.

By utilising the electronic version of Kanban (online eKanban tool; Kanboard.net 2015), you can get the advantage of using the project data for analysis: every move and change made for a task on the Kanban board is recorded in the system's database. We utilised this data for several reasons: a) Knowing how tasks are progressing over time, b) Knowing how individuals are participating in the team's work, c) Spotting problems in a project's work. As an example, the teachers could see when a project team was in trouble - value generation had stopped for a longer period of time. In that case, immediate communication and support for the group in distress should be provided. The following data view represents the progress of an example project:

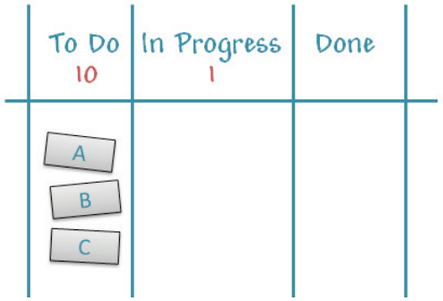

Figure 1. Kanban Board.

Figure 2-3. Kanban board in school project.

Experiences

Visualisation of work through the Kanban tool was tried out in the academic year 2014 – 2015 in two different courses, “Agile software development project” and “ICT Project”. The work method and Kanban tool were utilised in several project teams. In our survey, we found that 89% of the students saw that the work visualisation and use of Kanban boards supported and promoted their work. Further, 77% of students felt positive that they were doing the planning together, and 89% of the students found that the team’s visible work & status were very positive things. The work and status were visible to both student group and teachers.

Of the students, 67% were gratified in seeing their individual contribution in a team’s work; only 11% felt that it was not a pleasant experience. By utilising this tool, individuals could bring them up in the team’s work, and those who were not participating could be spotted out easily.

The students also expressed that the team’s work items were easier to see and the progress was easier to follow, because the Kanban is a visual tool. They also noted that this is an easy-to-use tool and suitable for most school projects that last for several weeks and up to several months.

Next steps

Encouraged by the results from the survey, the teachers are further developing the Kanban model for student projects and have started to gather experiences from multidisciplinary projects and especially outside the Information Technology field. Research results and experiences are to be published in the near future.

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Sebastian Blumenthal, Matti Iivonen, Irina Voloshina,
Cao Truong Hoang Phuong & Heikki Paananen

Salamander – project Merivaara

Client. The client for the project was Merivaara Oy, a manufacturer of hospital-grade furnishing and systems for healthcare providers in more than 120 countries. The company was established in 1901, and their head office is located in Lahti. The contact person for the student project group was Pasi Kankaanpää, Chief Technical Officer (CTO) of Merivaara. Arrangements were made to ensure that students also had other pointed contacts in Merivaara in case the main contact was busy.

Project. The idea for the project was to create an offline application for sales agents at Merivaara Oy. The sales agents would use the application for calculating prices (including selected features and side costs), which then are further utilised in making offers to the potential customers. Customers' desired features are chosen from a list of selectable features, and then the system calculates the cost for a specified system, and also side costs, such as installation price, installation supplies, transportation costs, etc. The customer wished the tool to be light and easy to use, thus, MS Access was considered as the best choice for the case.

Project team. The team name was Salamander, and it consisted of four members. The first member was Sebastian Blumenthal, who acted as project manager. His main duty was to work as coordinator and communicator and to handle all communication inside and outside the team. The second member was Matti Iivonen, who handled most of the presentation and visual display of the application and also wrote big parts of the documentation. The third member was Irina Voloshina, who acted as supporting developer and documentation writer. The last member was Cao Truong Hoang Phuong, who was in charge of developing the application with other members' help.

Project start

What activities took place? First, the team met the customer at Merivaara Oy. The students had a discussion with Mr. Kankaanpää about the products they were selling and what tool they desired to support their sales process. After that, the team members started to set up the plan.

After discovering the background and set-up for the project, the student group arranged a meeting with the project supervisor (Heikki Paananen) to decide which tools to use in the development work. The agreed tool, which was also preferred and approved by the customer, was MS Access. The next step for the project was to set up a planning meeting with the customer, in which all parties (student group, customer and supervisor) agreed on the project

Figure 1. Project team Salamander (photo: Bao Nguyen).

scope, method, schedule and the plan on how to implement the project.

All tasks were broken down and divided equally throughout the team by the project manager except for those tasks that required special skills. Tasks which were too difficult to deal with were solved in team meetings.

Problem analysis. The client had done a magnificent job in breaking the project assignment into well described parts, and the project group's duty was to discuss and verify the problem analysis. Emphasis on the problem analysis was on the feature listing and understanding the questionnaire items.

Project phases and challenges

Initiation phase. The first phase involved getting the idea and background information for the project by meeting the customer. After the Project kick-off, the requirements for the project, project plan and other documentation needed to be made. The requirements were changing over time due to the customer's wishes and team's technical skills. At this phase, the project team also chose working methods, development tools and the platform for the application.

In the beginning, the students noticed challenges in communication within the team and with the customer. Challenges regarding the availability of the customer representative in the development work were noticed immediately at the beginning of the project, and it also affected the first steps of the project – the project began relatively late. To overcome the challenge, other contact persons were appointed from Merivaara to support the development team. Another challenge was communication within the team since the members of the group were not very familiar with each other.

Execution phase. The next phase was about making the actual application development with

all the data provided by the customer. The project team made the questionnaire for the customer with predefined questions and answers. The challenging part was making an application with MS Access, which was not familiar to the project members. The team transformed all requirements into functionalities, and questionnaire items were coded into forms. At this phase, the development team co-operated with Merivaara's IT staff to improve the quality and speed up the prototyping of the application. The students felt that is was a very good learning opportunity to see how professionals work in real projects. According to project members, all their suggestions were easy to follow and easy to implement. Documentation was also developed by a responsible team member at them same time.

Closedown phase. The last phase consisted of "polishing" the final version of the application, testing, fixing bugs, creating reports and all other necessary documentation. The final testing for the application was done by the customer's representatives.

What we learned

The members of the project learned that communication is a crucial part of project development. It is also very challenging in real life (as mentioned above); the members had to wait for contact with the customer a bit longer than expected. However, further communications went fairly smoothly, as they had several contacts in the client company. The meetings were held as often as needed, and they could be rated as productive - the exchange of information between the project team and the customer was fast and exact. The team also respected the customer's language skills (fluent English) - all members could participate in the meetings equally. This was especially valued by the international students.

The predefined schedule didn't work, since it was made before the student group had an idea of what the project was about. The working method was altered when the team had agreed with the customer on the set-up and goals for the project. This needed to be done because every shown prototype provided more ideas about the application. In the meetings, the development team and customer discussed things accomplished so far, and about things needed to be done before next meeting. This was, in a way, a fast prototyping approach in project management.

Ideas for further development

When discussing further development ideas, the team noticed, during the development efforts, two different things that could be developed next: 1) admin view and 2) the possibility to modify previously made orders.

Further development would be needed in order to make a small user-friendly application form, along with the form that would allow admin to modify both the questionnaire and values in the questionnaire. Second, a small application form would also be needed to help users to access their previous order and to modify their answer in case they change their mind later.

Ngoc Duc Nguyen, Sami Leppilampi, Valtteri Määttä, Ville-Veikko Koponen & Antti Salopuro

ICT project for Aurio Hoiva Oy

The purpose of this ICT project was to create a door key tracking system for the company Aurio Hoiva Oy. Aurio Hoiva Oy is a Lahti-based company that provides home-care services, especially for elderly people. The company deals with a growing amount of their customer's home door keys, and the purpose of the system would be to help keep track of them. The current system is a traditional paper notebook kept near the key locker, and its usage is impractical and time consuming. Moreover, this outdated method does not allow tracking the keys from outside the company headquarters.

The team consisted of four project members. Team members and their roles in the project were:

- Duc Nguyen - Programmer
- Ville-Veikko Valtteri Koponen - Designer and web developer
- Sami Johannes Leppilampi - Junior Developer & Designer
- Janne Valtteri Määttä - Project Manager

Senior Lecturer Antti Salopuro of Lahti University of Applied Sciences acted as the team supervisor, and the contact person at Aurio Hoiva was their CEO Jan Olkkonen.

Figure 1. Nguyen Ngoc Duc and Ville-Veikko Koponen presenting their project results (photo: Bao Nguyen).

Project start

Following the ICT Project course process, the first task after the ICT Project Kick Off on 20.1.2015 was to set up a meeting with the client. This meeting took place on 26.1.2015. The client representative, CEO Jan Olkkonen, presented their requirements for the application to be developed.

Task description. The demand was for a tailored mobile application that could be used anywhere for monitoring the status of the customer home door keys. With the application, it should be possible to see if a key to a specific customer is located in the key locker or, if not there, which employee currently has it. Moreover, the application would also provide user interface controls to check a key in and out of the locker. The user interface should be simple and very easy to use.

Technical requirements stated that the application should run on the Android mobile devices used in the company. The existing web service provider of the client, moreover, only supported PHP development language in the server side of the application.

Team approach. During and after the meeting, the project team discussed the lack of proper skills required to make an Android application that the customer requested. That would have required learning to apply Java development language to implement the user interface and, within the team, it was not seen as a feasible solution in the given time slot of four months. Equally, the PHP development language was not previously known by anyone on the project team. Because of this lack of existing skills, the team decided to concentrate on a web-based application that would work just like an Android application and set the mobile version aside. For the implementation part, the team decided to choose Python coding language, mainly because of convenience.

In addition to the lack of skills, the team had a list of other problems at the beginning. First off, the team didn't quite know how to start working with the application and all the other tasks that had been assigned in the project. This was solved by just working and making all the required documents and tasks. The team programmer started to write the program from scratch. Still, the amount of work required for a final working application seemed too much to manage.

These challenges were discussed with the supervising teacher and, only at this phase, the team realised the expected effort that should be input in this project. In this same meeting, the supervisor was also surprised by the team's one-sided decision of the applied technologies. Despite this, the team mutually decided to stick with the decision to not make the required PHP/Java Android application. However, it was agreed to work on an Android/PHP version at the same time to gather new skills within the team. Eventually, this proved to be too demanding for the team.

Project phases and challenges

Planning phase. After the initiation and the first meeting with the customer, the team worked on the project plan. The deadline for this phase was set for 12.2.2015. This phase included the documentation of the project goals and requirements set by the customer. During this period, the project tasks and available resources were also to be recognised and allocated. During this period, the team also agreed and organised the ways of communicating and working by, for example setting up the working environment. For this, the team selected to apply Google Drive for documentation and Git repository for software code.

The biggest challenge in this phase was to identify the different tasks that would be required during the whole project timeline. Creating a feasible plan with small enough subtasks and, not to mention, their timings was difficult. In all, the eventual project plan was not successful. Within the team, there existed some lack of motivation and unwillingness to step outside one's comfort zone, which could also be seen as a certain kind of blindness to the required work.

Implementation phase. The actual work for the implementation started after the project plan had been presented to the client and to the supervising teacher. Because the client and the supervising teacher still requested that the originally requested technologies should be applied, the team decided to split the work so that one person concentrated on the Python and

Figure 2. First UI drafts.

web application implementation and another member on the PHP/Android application. This was done because the team wanted to secure a working solution to the functional problem, but at the same time enable also a solution to the technical requirements.

The work was organised into two three-week periods. Each period change was cut by a steering group meeting with the customer and the supervising teacher. The aim was to apply agile methodology, so that the subtasks chosen for a new period would always be specified in these steering group meetings. Between the meetings, the team organised internal meetings on a weekly basis. Meanwhile, the programmer published new functionalities to be tested, the customer commented as soon as they were implemented. The customer's comments and required changes were then communicated to the programmer. All the front-end parts of the web application were also tested by using a so-called smoke test template to improve the robustness of the application. The PHP/Android implementation attempted to utilise the input from the Python implementation by copying the layout and functional logic.

In the implementation phase, there were big challenges in organising the work. One team member had personal issues that prevented proper participation. Moreover, only one member was able to contribute to the technical implementation, while for the others, the learning of new technology was slow. This lead to an uneven split of the workload, and the whole project progress became dependent on just one member's contribution. Towards the

Figure 3. Log-in dialogue.

end, as it became clear that the PHP/Android version could not be implemented by the team, its process was discontinued and those team members focused on project documentation and reporting.

Despite of the difficulties, the iterative development approach with the Python version was successful. The essential functionalities specified by the customer were implemented as a web application, and a solution for the deployment was also presented. This would, however, require some extra investment from the client for a new web-hosting service provider.

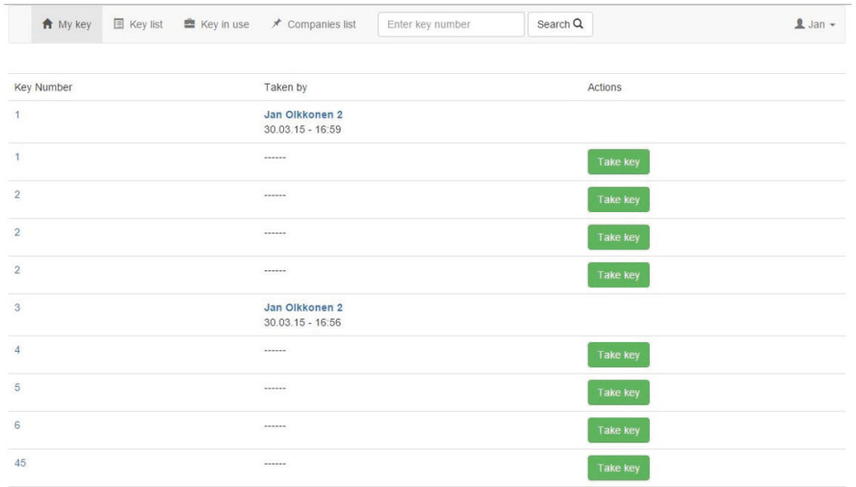

Figure 4. Final UI of the application.

Project finish. By the end of the project, after four months of working and learning, the project team was able to release a Python-based web application, and the customer was satisfied with the functionalities of the release. The team was also happy with the result, considering their coding skills and given time frame. According to the customer's feedback, as well as the team members' point of view, the application has a qualified look and is easy to use. This means that all the functionalities can be used within one or two clicks/taps on the user interface. Furthermore, the web application is designed as a mobile first approach. The user interface is responsive and dynamically fits without any missing details on all screen sizes, from small mobile phone displays to large laptop screens.

To deploy the application, because of the technical deviation from the original specifications, it was necessary for the customer to make an extra contract with a new web-hosting service provider. This caused extra work in the deployment, while the current website of the client with its contents was supposed to be transported from the old host to the new one. The new hosting service was purchased but, at the time of writing this, the website is still in the original place, and the application has not been fully deployed yet.

What was learned

The project, as a whole, has been extremely instructive. It has forced the team members to go outside their comfort zones and also to learn quite a few new skills. Altogether, this is considered as a positive thing, even though it seemed quite demanding and even impossible at times.

The team learned a plethora of useful skills including, but not being limited to, Git, general version control, password handling, team management and documentation. In addition, the team also learned how to handle customer relations, how to kick-start a project, and what not to do in both of these cases. These being important lessons that will no doubt prove to be useful in the future. The team also strengthened their general knowledge of programming languages and concepts, frameworks and server-side functionality.

During the project start phases, the team totally ignored the technical requirements and started working with faulty assumptions. It was learned that, in the beginning of the project, it is a responsibility of the project team to actively find out not only the functional but also the technical requirements and limitations. The project implementation phase should not start before all the essential limitations are known by the project organisation.

As well, for a project like this, it would be essential to split the workload more evenly than in this project. Now, the responsibility of the actual implementation fell on just one team member. This formed an unnecessary bottleneck for the project progress in some phases.

Moreover, the project offered a practical insight to a real life project. The uncertainty and changing environment are something that the project team just should be able to adjust to.

Further development ideas

For further development, the customer might benefit from a mobile application that would be more comfortable and agile for the employee during working times. It would also be good if there were a push notification or message to remind the employee to release the key after they return to the office. This idea came up after the team started tracking the system during the testing phase, while the customer was using the application. Also, at the time the system is finished, it doesn't have any system security protection. It would be better for the system if there were some kind of protection that prevents outside sources from entering the system.

Sara Kumpulainen, Tatu Lahdelma, Teemu Himanen, Si Dai & Antti Salopuro

Regional safety plan monitoring tool

The client of this project was Päijät-Hämeen Liitto (PHL). PHL is a regional council of the Päijät-Häme province and is responsible for the regional development and planning in the province. Municipalties of Asikkala, Hartola, Heinola, Hollola, Hämeenkoski, Kärkölä, Lahti, Nastola, Orimattila, Padasjoki and Sysmä are all part of Päijät-Häme.

This project consists of two different, and only partially overlapping, tasks. PHL was willing to reform their website, and they were looking for a new website platform to relocate their pages. The first task was to research and compare different website platforms and make suggestions to PHL about possible new platform choices, i.e. the classic first steps for an acquisition project of an information system. The second task was to build a monitoring tool for the implementation of the recently renewed regional safety plan. In the implementation of this tool, the technology selected during the first part was to be applied.

Figure 1. Sara Kumpulainen demonstrates the project results, Dai Si follows (photo: Bao Nguyen).

Project start

Our project group consisted of four 3rd year students of Information Technology and Business Information Technology at Lahti University of Applied Sciences. Teemu Himanen was chosen to work as the project manager, Tatu Lahdelma as head of programming, Sara Kumpulainen as head of documenting and Si Dai as the head of design. Senior Lecturer Antti Salopuro was the supervising teacher for this project.

The student team decided to organise the way of working so that all of the main tasks concerning the project should be done together at school. Group meetings were arranged by the project manager. In every group meeting, the team processed the completed work and made a plan for the work at the next meeting. Group meetings were also meant for project work and

preparing presentations. These meetings were held randomly throughout the whole project.

After the project kick-off event, the team organised a meeting with the customer. This meeting was necessary to build a mutual understanding of the results expected from the project. The client had strict time limits for the two separate project tasks, and because of this, the first focus was on the selection of the website technology. In general, the client was able to describe their requirements accurately enough so that their expectations were mutually understood within the student team.

By suggestion of the supervising teacher, the online tool KanBoard was utilised for the project administration. This tool helps the project organisation to identify project tasks and subtasks, to decide their priorities and scheduling and to follow their progress during the activities. For the project stakeholders, such as the customer or the supervising teacher, the tool offers a real-time view over the project status, which was seen as a way to reduce the amount of formal communication.

Project phases and challenges

The project team compared four different platforms against each other and against the requirements set by the client. Initially, Concrete5 was selected to be used for the implementation. It was deployed, but after some time of testing, it was found to be too slow for this case. Because this testing took some time, afterwards it felt as though the time had been wasted. On the other hand, it can also be seen as a necessary step to gain a rational perspective of the selection of the platform technology within the team.

The comparison between the different platforms was done by first identifying all different criteria set by the client for the platform. These criteria were weighed according to their importance and also categorised according to the MoSCoW – method to categories of Must have, Should have, Could have and Would like to have. The client was pleased with the summarised results of the platform comparison and eventually decided to choose WordPress as their new website platform. This decision was supported by the highest score in the comparison.

In addition to being selected as the platform of the new website, WordPress was also selected as the platform for the second project task, the monitoring tool of the regional safety plan. The requirement was that the application should be accessible by different stakeholders such as different public authorities and individuals living in the region. In the application, the user should be able to read through all parts of the safety plan and evaluate the state of implementation of each specific step of it with a simple user interface control.

For each step of the safety plan, a user that is willing to evaluate the level of its implementation, should be able to simply select the desired level. The customer also wanted each selection to have the option to add a free comment after every question.

A key requirement for the safety plan was to provide traffic light signals to demonstrate the

Figure 2. User Interface of the created application.

average value of answers to each question. This would give a rapid view of the overall status of each separate question. The colour red would mean that only a few or none of the respondents see the step already being implemented. Yellow would show that the step has been partially implemented, and green that most evaluators think that the implementation is completed.

The layout design of the user interface was made using Microsoft Visio tools. Initially, the technical implementation was supposed to apply WordPress free plug-ins for the user interface controls. These plug-ins, however, had some critical limitations when making questionnaires with comment fields. The team members had some experience with the WordPress form-maker plugin, so the User Interface Design was initially designed based on that. After some trial and error, it became clear that the form-maker plugin did not allow adding comment boxes inside question fields. Eventually, the questionnaire had to be coded by team members from scratch.

The figure presented here shows the user interface of the final implementation: an example question, with multiple choice radio buttons for the user to express her evaluation. An open comment can be added on a free text field, and the traffic light symbol visualises the current summary of the average answers to this question.

The questionnaire and the application behind it were tested by the team members and client organisation.

Project end

The project was finished within the given time frame. The project was delivered to the customer in the project end meeting, where all results were reviewed together with the client. All material and data with instructions and documentation was transferred to a repository maintained by the customer.

On the whole, the work and report concerning the platform comparison with suggestion for the new platform were seen as a valuable asset for the client organisation. The produced questionnaire is also working properly, and it was installed in a host controlled by the customer. The project managed to produce working research results and application for the customer.

What was learned?

Working in a team for a real-life problem and real customer has given an opportunity to learn many different things.

The most important lesson learned was the significance of communication, which can be seen as a key in every project. Every team member should continuously be up-to-date on what is going on in the project. Communication between the team and the client is equally important. Ensuring that the problem has been properly and correctly understood by the team should not be neglected. As well, the client should be kept informed about the status of the project and all essential decisions should always be confirmed by the client.

This project experience has also given some impression of how it will be to manage and work in a really big project. If different parts of the project are solved by different persons or different groups, a mutual trust is necessary.

Ideas for further development

For the client, it is obvious that the implementation of the website transfer to the new WordPress platform will be realised in the near future. For the monitoring tool, there is not much to suggest for further development.

As for the ICT studies, in the future, on large projects like this, it should be possible to operate completely in English. This is a challenge while, as in this case, the final application and lot of the relevant information is only available in Finnish. For international students, it is difficult to participate in implementing an application that is completely in Finnish.

Although it seemed as a good idea in the beginning, the use of Kanboard was eventually confusing. To get a greater benefit from the tool, its usage should be trained well enough before the project start, so that all team members are familiar with it.

Kalle Ronkainen, Teemu Suhonen, Toni Tynninen, Cong Nam Doan & Antti Salopuro

Website renewal and data transfer

The main objective of this project was to improve the website of Suomen Pystykorvajärjestö (translated as Finnish Spitz Club) (http://www.spj.fi). The website was technically working, but there were many things to improve: the site navigation and the content had to be displayed in a much simpler way, since most of the end users are elderly people. The old website was also not at all scalable in different kinds of mobile devices. The client also wanted all of the current data to be available on the reworked version, which proved to be challenging.

The number of different features and activities on the website is huge, considering the type of the owner organisation. There are many different kinds of events organised, such as competitions, tests and dog shows, which all have their own, dedicated activities ion the site. Also, each different dog breed has their own sections for information, communication and also separate registers for pregnant bitches and new-born puppies for marketing and reservation/purchase of puppies.

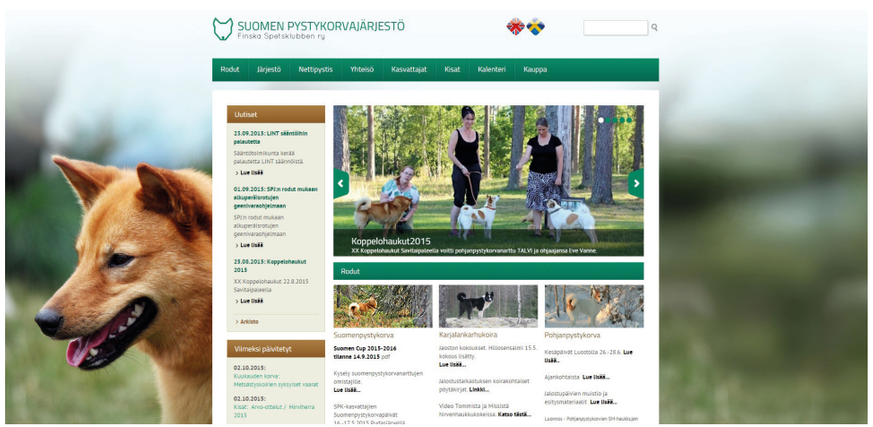

Figure 1. Front page of the new website.

In addition to the website project, there was a side project to renew the client's web shop. The student team decided that we would prefer not to make two bigger projects at the same time, so the web shop task was given to another group in the web shop course. The team was communicating with this other group in order to unify the site designs.

Project start

The project group was formed and the task given during the project kick off seminar in the end of January 2015. Students Kalle Ronkainen, Teemu Suhonen, Toni Tynninen and Doan Cong Nam were assigned to the project. The first three of them are from the IT12 group and Doan Cong Nam from the BIT12 group of Lahti University of Applied Sciences.

Counting from the project kick-off, there was about four months to complete the project. Kalle initially contacted the customer to agree on the first meeting, to get more detailed information about project tasks. Once this was done, the group started making the project plan and, at the same time, worked on some first drafts on the website's appearance. After finishing the project plan, it was reviewed and approved by the customer and the supervising teacher.

In the project plan, the main responsibilities of different group members were specified. Kalle was nominated to be the project manager. Teemu would work as deputy project manager as well as the main designer of the new website. Toni Tynninen was responsible for site design and navigation as well as for the documentation checking for submission. Doan Cong Nam would make notes for meetings as well as documentation first drafts. Other project works were divided according to each member's skills and capability.

Choosing CMS and building the website

When considering a suitable content management system, three different solutions were compared: WordPress, Joomla and Drupal. In the end, WordPress was chosen because it was the easiest one to use for the customer. During a steering group meeting, Kalle introduced the selected CMS and, as it was approved by the customer, the team started to get properly familiar with WordPress. The first plan was to install WordPress on the customer's server (provided by Nebula), but due to reasons beyond the team's control, it wasn't as simple as planned. In order to not fall too far behind the schedule, the group decided to install WordPress on OpenShift (www.openshift.com), a cloud server solution provided by Red Hat. This was done in order to have a chance to try out the features and to also start building the foundation for the actual website.

Firstly, different sorts of themes were compared and the student team chose one that would look nice both on desktops and mobile devices. It did not take too much time to make the site's main design look as we had planned, since the chosen theme was easily customisable. The primary point was to make the site easier to navigate, and this was achieved by moving subsites under one site using tabs. Also, smarter sidebars were built, including the desired subsites in order to easily find them.

Problems and change of the project goal

After most of the site templates had been implemented, it was time to start thinking of how to move all the data from the current site to the new one. The first solution was to try to find a WordPress plug-in that would easily move all the data, but the plug-ins were not good enough for the purpose. Since the site was located on Nebula's (a Finnish ICT service company) server, the team had to contact their customer service in order to get the FTP account information to get their current site files in order to start adding them to WordPress. As the account information was available, it was quite rapidly realised that it was impossible to get the current site files transferred with any automated methods. The structure of the site database was not logical and it seemed that the data is spread into many different places. Even the most simple text documents contained links to pdf files, whose location was not following any clear rule.

The team had a discussion with the supervisor and came to a conclusion that there is no point or time during this project to move every page by copy-paste method, so it was mutually agreed to proceed by making empty site templates and providing instructions on how to manually add content. This way, the customer could move the sites by themselves when they have time. The customer agreed with the suggested solution, as it was clear that it was the most practical way of continuing the project.

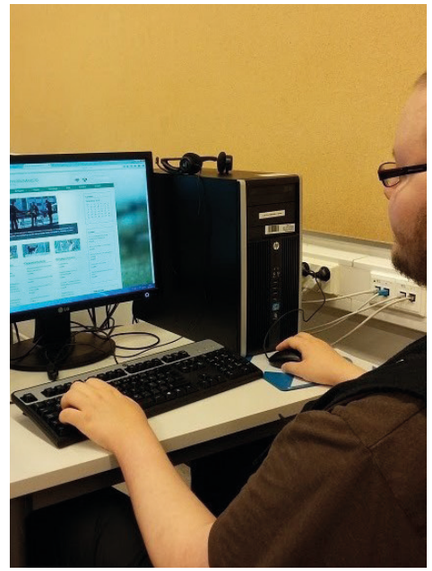

Figure 2. Project manager Kalle Ronkainen adjusting the site layout (photo: Teemu Suhonen).

Finishing the project

It took a lot of work hours to make the site look okay. The site templates were finalised, so the customer could start adding content with the help of the tutorial provided by the project team. The team also produced the mandatory project reports and the presentation for the project's final seminar. The project result was provided to the customer, and the project was officially closed in the final meeting with the customer. During this meeting, all required documentation was

delivered, and the responsibility for the website maintenance was transferred to the client.

Learned lessons

At the start of the project, the task seemed to have a lot of work, but it seemed feasible. The team was supposed to apply some known CMS platform and most of the project time would go into routine tasks when transferring the data between the old and new site. The most important lesson learned was that the projects should not be taken too lightly. There can always be surprising factors that can affect the outcome. In this case, the illogical structure of the source data prevented the use of any automated transfer tools, which changed the whole purpose and goal of the project.

Related to that, it was also learned that when making future sites one should aim for simplicity and standard solutions in organising the site. At the least, there should be just one solid database containing all the files, including site contents and images. In this project, not only was the data transfer difficult, but it also must have affected the old site maintenance as well, making it very difficult.

When making a design for a new website, it should be planned well. Thinking ahead and planning the possible future contents of the site makes it easier to adjust the site.

A very important lesson learned is also that the project group communication should be kept continuous and constant. Communication should also be spread to the whole project team and to all stakeholders as well. No one should be left in the dark.

Technically, the project offered a fresh insight to different CMS platforms. The comparison between them gave all participants a view of the possibilities they each offer. Also, it was a useful experience of such a comparison between different information system solutions as such. During the actual implementation, it was learned that WordPress CMS is rather usable but also has its difficulties. Even though it proved to be a good choice for this project, the project needs should always be carefully considered.

Olli-Pekka Lahtinen, Antti Tuominen, Tero Kumpumäki, Aapo Heinonen & Heikki Paananen

SmartUp – Project CareerApp

SmartUp – Project CareerApp

Client. The project's client was Elina Arasola, an entrepreneur and CEO of SmartUp Oy. She has extensive work experience in the fields of career and learning management, also in personal, competence and enterprise development. Elina Arasola started her company, Smart Oy, over two years ago.

Elina Arasola's work in SmartUp consists of a wide variety of different tasks, including career management, skill workshops and developing human resource software to increase the utilisation of skills inside companies.

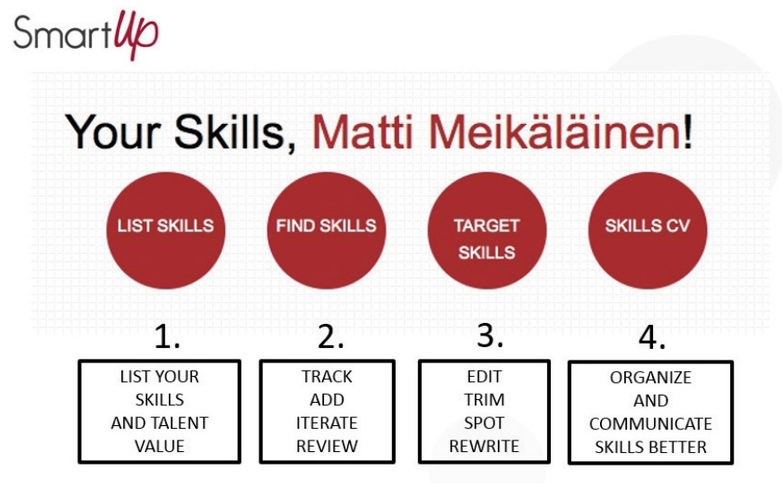

Figure 1. Program concept.

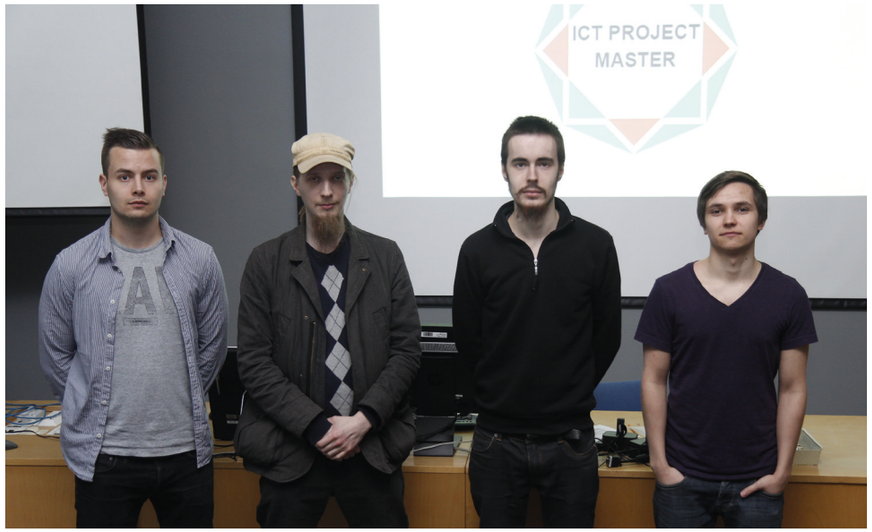

Figure 2. Project team SmartUp (photo: Bao Nguyen).

Project. Project SmartUp began at the end of January 2015 where the project team, Time to SmartUp, was introduced to the project. The team first met with the client on the 28th of January at the first project meeting. During this meeting, the client introduced her new business idea, at the time known as CareerApp.

The main idea in the project was to create a website application where users could a) manage their skills, b) use skill discovering tools and c) utilise the website application to certain targets, for example job applications and CVs. The idea has been under consideration few years, and now it was to be built into something concrete, which raised the interest of potential customers and co-operatives.

Project team. The Time to SmartUp team consisted of four team members: Olli-Pekka Lahtinen, who was in charge of the supporting mobile device report and business idea testing; Antti Tuominen, who worked on the CareerApp report and usability testing; Tero Kumpumäki, who was the main developer of the CareerApp prototype; and lastly, Aapo Heinonen, who acted as the project manager.

Project start

What activities took place? The project was introduced to the team during the third week of January, after which a quick 10minute meeting resulted in the creation of a Facebook group to establish a line of communication within the team. A few weeks after this, the team had already contacted the client, arranged the first meeting with her and discussed the roles and skills within the team.

After the meeting, the team discussed the project, possible deliverables and began the creation of the project plan's first version. At the same time as the team worked on the final version of the project plan, they also worked on the first possible draft of graphical user interface designs for the CareerApp web application.

Organisation. Project tasks were done mostly together or in small groups during the entire project, with the supervision of the project manager. Tasks were divided based on skill, preferences or sometimes just assigned by the project manager.

Problem analysis. There were no clear business problems to fix in this project, since the goal was to create something new from a general idea the client had. When analysing the project's problems, on the other hand, the team had several issues concerning the client and her understanding of developing a web application, and also issues within the project team. Project members tried to get as much feedback as possible from the client about the prototype in order to guide the development process in the right direction. Co-creation of the possible features meant that the team had to educate the client at the same time as develop the prototype. Further, the questions that were asked from the client were carefully formed in order to avoid misunderstanding between the team and client.

Decided approach. In developing the prototype, the team already knew that the best way was to use an agile approach, and the project manager favoured a feature-driven method due to the nature of the project. The feature-driven approach was a good choice for the project, since the team had to understand the business idea behind the prototype for the design phase of the project. Understanding the goals of the project, why they were set and how it could be implemented was supported by the feature-driven approach. The goals also made the project development and innovation much easier for both the client and the development team.

Project phases and challenges

Design phase. During the design phase, the team created graphical user interface plans, a selected set of use cases and a software requirement specification document to represent to the client what the web application would look like and how it would work. After a few versions, the design plan was complete. The main focus of this phase was to get a) an understanding of what the client wanted, b) prove the idea's basic idea before implementation, and c) decide how it could be implemented as a web application.

Implementation phase. After the design phase was complete, the team created the base for the web application prototype and began implementing the web application based on the plans. The team met with the client approximately every other week to present the prototype version and to get feedback, but the client was also able to give feedback at any time via email since the prototype development was done online. The client was also able to access the development prototype at all times.

The prototype was implemented by using a feature-driven agile method. Prototype documentation was created at the same time as the prototype, which consisted of a report on a possible mobile application to support the prototype and a document explaining the prototype and implementation choices. The team also tested the prototype and reported the findings to the client; some small modifications were made based on the feedback received. The team focused on creating different methods for a feature, presenting them to the client and then modifying the best option as much as possible. The team first created the basic elements of the features and then focused on details and more specific features of the prototype, since the main features were related to each other and depended on each other.

Project finalisation

The project was finalised during the second week of May. The team presented the deliverables to the client and shared the project files via a cloud service. The client was very pleased with the results of the project. Furthermore, the client has already begun to continue the development efforts for the prototype, and she is also keeping the team in the information loop to give up-to-date information about the development of the prototype. The finalisation of the project was short due to the focus on the implementation phase and since it only consisted of documentation of the project and not the prototype.

What we learned?

The team learned a lot about project documentation: a) how important it is, b) how it supports the project work, and c) how it should have been done properly from the beginning of the project.

The members of the project team also understood that even with the current project and development, they can contribute in a real-life project and create something useful with value as an output.

The amount of communication in a project within a team and even with the project stakeholders is massive and requires a lot of work before, during and even after the communication event. The team also understood the negative effect of missing one individual's work efforts; even one team member can affect the whole project's outcome massively, and even worse, it will affect the other team members. The students also found that people outside the project, like testers, possible end-users and such, can have great ideas on what features to add into the application, as well as give vital comments which can affect the feature's functionality drastically.

Ideas for further development. The Career Application report consists of the future development features that the team planned for the prototype. The team also discussed with the client about a possible future project, which could be created to help develop the Career application to the next level. The likelihood of the client asking us to help with the development of the web application is a very possible option.

Lasse Seppänen

Guest article: 15 years of projects in HAMK Business IT

Business IT degree programme (BIT) of Häme University of Applied Sciences (HAMK) has cooperated with Lahti UAS Business Information Technology programme for several years. The programmes share similar knowledge base and therefore the cooperation benefits both parties. Mr. Lasse Seppänen acts as principle lecturer in the HAMK BIT programme.

In the Häme University of Applied Sciences Business IT degree programme, international project competences are developed during the third year ICT Project. The clients are either local companies or the university, mostly the IT Management department.

During their first year, students learn the basics of project management. For two years, they carry out small projects. Project studies culminate in an ICT Project. In the beginning, teachers orient the students in project management. Regular project meetings are held between the students, the client and the supervisor. English is used as a spoken and written language. Meetings are also often in English, which has received good feedback from the students. The project is integrated into an English course, and the outputs of the project are also evaluated in that course.

Figure 1.
Lasse Seppänen, Principal lecturer, HAMK

Typical projects are versatile web pages and network services as well as introductions and configurations of services. ERP-related projects have also been carried out as well as demanding programming projects.

The project management has been changed over the years. In the beginning, we used a waterfall method, starting directly with the project plan. This proved to be too difficult. Now the students learn their environment first and then make the plan. Nowadays, SCRUM-type meetings are used during the project.

The project manager is responsible for both client and supervisor interfaces. The manager organizes all meetings including reviews with another project team. The peer-to-peer response is steered in groups. The project has been operated from September to February, but for this year, we have extended it to April. In February, the teams present their projects at a large international seminar.

The student gets experience in working in a project and the client interface. They learn the importance of planning, timetables and documents. They realise that a project manager with great responsibility needs to be on top of the project and its members all the time.

The clients have been mostly satisfied. They get new systems and new knowledge. Sometimes one project has taken over from another project from the previous year. The clients have been grateful to the teams for these joint efforts and the constructive intercommunication. The clients have thanked the teams for their joint efforts and constructive conversation.

The first Lahti UAS ICT Projects review consists of nine articles written by students and experts of Lahti University of Applied Sciences (Lahti UAS), one article written by a cooperation partner in working life and one by a colleague at a partner university. The aim of the review is to describe the current state of the project studies in the Business Information Technology Programme at Lahti UAS and to present the ICT projects carried out by the students in spring 2015.

This publication is a part of publications of the Smart Industry focus area. Smart Industry regenerates production methods and service business operations through the use of digital applications. It creates more resource-efficient technological solutions, products and services, which in turn create new business models. Smart industry promotes business networking and the use of high technology, robotisation and the industrial internet. It promotes social innovation to support welfare through experimental, creative and responsible activities.

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