Motivation – Networking - Cooperation
The Cisco Networking Academy Program from Hungary

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I. INTRODUCTION

The Cisco Networking Academy Program celebrates its 15th birthday this year. This event creates the opportunity and at the same time obliges us to make a summary, moreover define new challenges and solutions.

Based on the intentions of the Hungarian Networking Academy development we consider the motivation of participants and effectiveness of the training services essential. This means the following:

- continuous and dynamic contact with the world of training, technological development and with the actors in the labour market and economy.
- Besides long-term, comprehensive curriculum development from now on it's possible to start new and current curriculum and content development projects from the level of those who demand them.
- Young people choosing a career are interested in IT technology; nevertheless they haven't got enough thorough information to choose well between IT technology, info-communication or networking fields.
- The need for info-communication professionals is growing more rapidly than the growth of the number of experts, as the plans, strategy and facilities of the sector were not enough to meet this need. (The amount of information have increased by 50 times, the number of professionals max. by 1,5 times during the last 10 years. [1]

The answers for these challenges are:

- Transferring information to young people about the opportunities of info-communication field in a way that is close to their interests, communicational environment, raises attention and motivating.
- To work out content development that could radically reduce the time of program and curriculum development based on the needs of the economy and organizations, with the cooperation of practising specialists and teachers using web2 utilities.
- Informing the teachers in higher and vocational education about the communicational environment young people expect and demonstrate those utilities and methods with the help of which they can lay the foundation of self-directed learning.
- Setting a standardised system for methodological know-how, professional know-how, development framework and sources through consortial cooperation.

II. THE AIM OF THE ACADEMIES – FRAMEWORKS, CONSORTIUM

At the beginning the primary aim was to educate as many specialists as can cope with the needs of the suddenly extended client networking and systems of Cisco Systems Inc. They were to achieve that through transmitting practise-based networking knowledge that even made it possible for the students to find network engineer's jobs right after finishing university or other educational institute.

The first Networking Academy was founded in 1997. The success of the program contributed to further development of the company as the growing number of Cisco-trained engineers – later specialists and managers – generated more and more sales for the company.

Today the Academies work almost as universities, well-controlled internal institutes within the recipient organization. They have independent, well-framed educational aims with adjoining training programs and constantly updated e-learning teaching materials and online curriculum; the qualified instructors are controlled and evaluated; students participate on national and international competitions, furthermore can get important globally recognized industry certifications concerning the labour market at the end of the courses.

"Such a system of institutions considers an important aim to develop students' competencies, to secure self-paced learning and total utilization of the effects that students' environment can offer. (...) Moreover activities and requirements to reach the above goals, precisely set and transmitted aims and expectations, flexibility and stimulating individualism, frequent and good-quality student-teacher interaction with personal care, proper student relations, community experiences and positive evaluation, assessment." [2]

In the spring of 2012 the so far successful program changed worldwide. This change concerned several fields and there was a considerable "evolution" of organizational and operational matters. In Hungary it happened on 14 March, 2012. Due to the reform the formal structure of the Hungarian Cisco Networking Academy became an open and multilateral system with many partners. Thus besides the traditionally teaching Academies there appeared the Academy Support Center (HTTP Foundation) responsible for providing information, further training and support for the Academies, the Instructor Training Centers (HTTP Foundation, Ányos Jedlik Technical and Industry School, University of Pannonia), moreover NetAcad Resource Partner (Observans Ltd.) that is active in such prominent fields as fund-raising, methodological support of curriculum development and contact dynamization between the world of work and the training institutions.

By the autumn of 2012 the challenges are clear for all participants. These are not the handling of hardships and problems of the transformation, but rather the effective and up-to-date maintenance and development of that Training Network which has to create, inspire and launch a whole generation of specialists.

These challenges have almost been unchanged for 15 years, since the start of the Cisco Networking Academy Program, nevertheless participants have always been faced newer tasks and aims year by year.

III. SOCIAL FRAMEWORK AND INDIVIDUAL MOTIVATION

A. Choosing a career

Choosing a career or a profession has high risk typically for the age group between 14-18. It is easy to find arguments for IT field, in particular for info-communication. The question is whether these arguments coincide with what is motivating for young people.

It is a fact that info-communication technologies make up that communication field (games; Youtube; Facebook; Wikipedia) that offers attractive community fields for our target group, the young people at the door of choosing a career.

But how interesting is it for them to glance behind the scenes? Are we able to arouse their interests to learn what framework the leading providers use for spectacular and glittering settings? It is exactly one of our possibilities – to lure these people who are choosing a career behind the scenes. We have to show them the process, facilities, technologies that define the way we feel about communication and our effectiveness.

Cisco believes that the Internet and Education are the two great equalizers in life. But how can a teenager struggling with learning about the world get in touch with them? How can we translate this message to their language and important values for them?

B. Studies – maintaining interest

Nowadays vocational education - let it be in a high-school or higher educational institute – has to transmit not only skills development and competence improvement, but they also have to teach students how they can enlarge their knowledge and find information essential for their work. It cannot happen without motivation for studying.

To establish and maintain the motivation for studying curriculum developers, instructors, and teachers always have to find an answer: "Why is this knowledge important for me and those who are important for me? " and "What makes this knowledge current?"

These are far not just philosophical or theoretical questions. Our target group is waiting for an answer and gets motivated only if involved. We have to ask curriculum developers, teachers, IT specialists and development teams which are the tasks, exercises, challenges that motivate learning and can turn students into specialists and self-confident professionals. Specialists, who have a place among those, who form, provide or maintain the IT technology.

Holograms, TelePresence, WebEx and Video Surveillance are just a few examples of Cisco products visible in entertainment.

C. Location

Those who know young people know well that behind the surface of disinterest there lies curiosity, they can be touched and involved, however serious offers are demanded. We'd repeat our top argument – the managed information has grown 50 times and the number of specialists only 1.5 times during 10 years in the field of info-communication.

There's enough space for future. Within the Networking Academy this space can mean curriculum, trainings, exactly defined demands, and industry exams. The arguments below are supported by exact study opportunities and achievement criteria.

- Validate your skills to employers and colleges
- Provide opportunities for higher salaries
- Increase options for career growth

IV. THE LEARNING MATERIAL DEVELOPMENT

This chapter deals with the newly developed curriculum and methodology that are all available on the webpage of Moodle course which completes this study.

(www.observans.hu   ICETA menu item - username: iceta; password: iceta)

Based on the target group of the completed curriculum three fields can be differentiated.

- Curriculum for those not yet joined the Academy Program;
- Developments for the traditional Academy program;
- Materials for those who joined the program through adult training programs;

A. Developments for the "Pre Academy" students

The success of the Academy Program is granted by the needed permanent quantity of students entering the system. Cisco measures the programs by the number of students finishing the programs and it sets the annual plan numbers and judges the given regions achievements based on that. These index numbers are becoming more and more difficult to secure, so continuous efforts must be done to fulfil these terms.

For instance the number of IT Essentials students (the entry level) dropped by 18 % (2011: 1306, 2012:1076 students), the number of CCNP students (the highest level in the Program) dropped by 48 %-al (2011: 33 students, 2012: 17 students), but the CCNA Exploration finished people are increased by 38 % (2011: 593 students, 2012: 821 students). Calculating with all the areas in 2012 3 % more students finished the Academy Program than in 2011 (2011: 6812 students, 2012:6885 students).

It is the responsibility of the curriculum developers to present such material that is attracting for students and can arouse their interest to join the Academy's programs.

To pay attention on the target group's age differences is also important. These are such young people who grew up watching mainstream Internet films and are everyday users of today's Web2 applications, nevertheless who are

not exactly familiar with the underlying operational mechanisms, the setting of the Internet framework.

This age group is impressed by hackers' activity and adventurous computer hacking seen in films. If this topic is approached the right way it could be involved in presentations that can catch the youths' attention. An example to this is Prezi © presentation. It's unique display grabs the attention visually. The simplicity and graphic topic management starts from the basics of packet switching to reach the omnipresent Internet and even its dangers. On the one hand these dangers are exactly those to which Cisco Networking Academy Program gives a solution, on the other hand it offers an attractive and marketable knowledge for young people choosing a career. The demo presentation can be found on Moodle courses.

B. Developments for the Academy students

Learning Management System

Cisco Networking Academy has been leaning on e-learning systems and opportunities offered by studying environment since its start in 1997. The first 15-year-part was closed these months with the total reform of the Cisco training system (introducing NetSpace).

The main result of the first phase is that the administration of the trainings, course starting as well as publication of the training programs was carried out in a world-wide and standard system. The databases connecting to such a standard and overall system set the basement and opportunity for quality assurance, data management and development processes which improved the efficiency of communication within the network and the grounding of content and curriculum development.

The newly introduced system offers more than that. It proposes such learning environment that stimulates the relations between instructors and students. Furthermore can make more out of the cooperation and enables publication of supplementary materials. These months are about the switch, giving a unique opportunity for the instructors to learn and acquire as many choices the system offers as they can.

Packet Tracer Activities

Besides practical and well-structured course materials particular attention was given to interactivity by developers of NetAcad, which offers great opportunities for simulation based tasks and learning environment.

Packet Tracer (PT) is a well-beloved and frequently used teaching application. This is a realistic simulation and visualization learning environment, hands-on lab equipment provide opportunities for learning to set real network devices. It is problematic that most of the time instructions are very concrete, students are led on difficulties step-by-step though in real life during installation there is no such guidance or mentor who can help if something goes wrong.

Figure 1. illustrates this problem very well. Even in case of the most challenging competition exercises for the most qualified students, exercises are created in similar way.
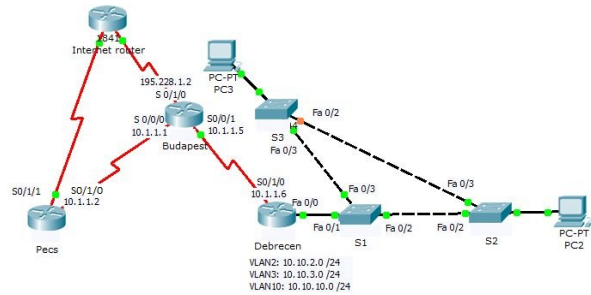

Figure 1. The topology map from the 2010 Networking Acedemy Games in Debrecen

"Create subinterfaces of the Fa0/0 interface on router Debrecen. For subinterface ID use the VLAN's number. The form of the addresses should be 10.10.x.0 /24, where x=VLAN number (No need to create subinterface for VLAN 20!). The router should always have the 10.10.x.1 address (which will be the default gateway for that subnet)." [3]

2012 Euroskills Hungarian Semi Final Competition was an interesting attempt for breaking this tradition (Fig. 2.). The exercise to be undertaken was replaced by 'heroes' who had to do certain tasks before reaching the desired goals.

Considering the length of time and difficulty, the new type of exercise was the following:

"Your task is to ensure the way to Tikal with your heroes. Both heroes have to walk on their own path, even if their final destination is the same. For this please make the paths both sides of Lamanai and Tikal walkable. You should name the beginning of the path with the first name in Tikal. Here Tikal doors should have the suitable identification number of the path." [3]

The interpretation of such a fabulous problem definition and colorful pictures placed students in an embarrassing situation to perform the tasks, despite the fact that organizers introduced the new "atmosphere" in newsletters the days before the completion. The best result of 71 competitors was only 79%, and the average competition results were also far lower than those experienced before with similar activities.

Competences to be improved by tasks like this are problem solving competence, creativity and system approach can be improved.

Figure 2. The topology map from the 2012 Euroskills semifinal in Budapest

Mind Maps

We have found that the number of IT tools and methods offered also by Web2 applications are widely known and used in business sector, are little know by IT teachers, and tutors. Or even if they know these applications, the use of them in education is still not common, and students can find these tools faster than their teachers.

Networking Academy gives particular attention to support the usage of these tools among tutors. One of them is Mind-map.

With the help of Mind-map a given topic can be easily summarized and visually displayed thereby supporting the representation and learning ability. The power of Mind-map is in its easy and structural mode of action, because „the mind map allows an infinite sequence of associative 'probes' which comprehensively investigate any idea or question with which you are concerned." [4] Therefore the use of Mind-map is desired in NetAcad curriculum. An example of this is shown in Figure 3.

Competence development: establishing logical sequences

Dictionaries

Thanks to the localization, curriculum can be reached in Hungarian and English in number of cases. In some cases technical terms can be combined in written and oral materials which is likely to mislead the students. We consider it very important that continuously updated vocabularies are available and provided everybody in the learning community.

Competences to be developed: reading of professional materials and to be professionally up-dated in general.

Presentations

There is such a great number of developed teaching materials are available that there is no need to list them. But this is important to have an available background for both teachers and students who are on an independent quest for knowledge. For instance a lecture on "The history of the Internet" or a presentation on "Layer 1 encoding technology". Both can be found on the webpage of Moodle course.

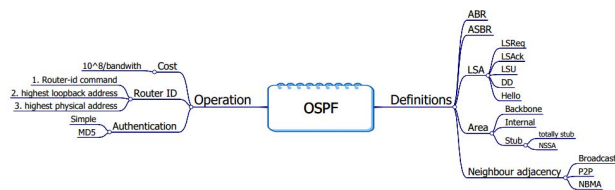Competences to be developed: these materials can be leveraged almost on every field.

Figure 3. Mind map for the teaching of OSPF theory

C. Developments for the "Post Academy" students

Regarding this theme the aim of curriculum development was to adapt traditional course materials to distance learning and blended learning courses.

In the year of 2012 two e-learning course materials were written in Cisco Networking Academy Program in Hungary. Both of them were for the first two semesters of Discovery and Exploration courses. The approach was different for the two courses. In the first case the course was held online, so the tutor had to focus on teaching, incoming questions, preparing for practice. (His only help was an assistant lecturer, who answered chat questions during the lesson). The second e-learning course was a special, previously prepared, professionally cut, animated video. The teacher was on duty during the lecture to answer chat questions. At the end of both courses it was possible to have a personal consultation to develop personal relationship.

The start of a thematically unique adult training program, which adapts supply and demand for labor market, plays an important role. It would amend the present knowledge with IPv6, Wireshark, a CCNA Voice course or VMware and Linux. The program is under construction, but the demands of big companies can be felt.

V. THE ASSESSMENT SYSTEM

We all know how important it is to recognize someone's performance and dedication, especially for the instructors sharing valuable knowledge with their students. There was an initiative in Hungary dating back to 2009 when 6 instructors were named "Instructors of Excellence" and 2 Regional Academies (RA) named "Academies of Excellence". The application process was Spartan, sending all the related information by e-mail. However, it became quite obvious that we had problems with instructors of outstanding performance, as they were shy enough not to apply for the awards. This suggested the idea of nomination, detailed in the following paragraphs. It was not clear and transparent enough, and especially not scalable for larger communities.

In 2010 PONTIS Foundation – operating as CATC Hungary at that time – took up the challenge of developing a system (including setting up a transparent set of criteria) supporting the assessment of instructor performance in the Central and Eastern European region including Russia and the Commonwealth of the Independent States approved by the AAMs and Nathalie Barreneche, a Corporate representative responsible for the Instructor Recognition (IRE) track.

This web application was a result of tremendous work with the hope it would become a useful tool for the NetAcad community. There were three keywords in the focus, while designing and implementing this application:

- Flexibility to provide a tool which supports the organizers of Instructor Recognition at different levels (currently regional, but local & global recognition is also supported).
- Objectivity to use a clear, predefined pool of criteria (weight can be different award by award,

and addition of new criteria is also possible) to make the applicants from the region comparable.

- Simplicity to make the use of this tool easy and logical.

The application was built for the future with a scalability to be used at regional (international) and national levels.

This team discussed the initial categories and awards, and the related criteria in Dec 2010. Then the development team coordinated by PONTIS took over and worked out the concept of the entire procedure supported by an online web application (creating categories and awards, inviting nominators, making nominations, inviting evaluators, evaluating candidates (nominees), announcing the results at the Regional Cisco Networking Academy in Budapest between May 27-28. In early February the set of criteria to consider for the different awards was finalized. The procedure and the planned schedule was presented to all Cisco Academy Training Centers (CATCs) and Area Academy Managers (AAMs) on iPortal by Feb 10, and approved by AAMs later in that month. AAMs made recommendations for the persons to be invited as nominators (more than 190 nominators from the region) by Feb 21. (The related feedback was the region might be too large to handle in such a short timeframe.) All the invitations were sent out to the nominators on Feb 28. As the activity was low in the first period, there was a second wave attacking on all possible fronts: AAMs reemphasized the importance of nominations, a Step-by-Step Guide was provided for AAMs and nominators, video help was created (recorded by Webex), and additional email reminders were sent out.

By the deadline (March 31) there were more than 130 nominations from the region, which meant an average of more than 22 candidates for each of the 6 available awards. The nomination was reopened for those communities that had difficulties with the nomination process.

Then the help of the international community led by the AAMs was required to participate in the „jury" of evaluators. AAMs were asked to name two evaluators from their region. We wanted to rely on as much objective data as possible (from AC), but wanted to provide subjective areas to recognize those instructors doing a lot for the community (organizing competitions, events, sharing valuable technical information and teaching aids).

The rankings were automatically set up after the evaluators finished their job. Deadline for getting the results: April 15.

As this was a pilot project and the web application was still a work-in-progress, there were problems expected and unexpected. To automatize collecting the objective data a report from the Academy Connection was provided by Cisco, which was not reliable in all senses (e.g. CCAI certifications). Some raised the question of proving the validity of certifications. Obtaining this information from the Cisco Tracking System was considered, but the automatic extraction of the relevant data could not be solved because of data protection policies.

The roles used in the Web Application:

- Category manager: A category manager is able to create, edit or remove categories (e.g. CEE Awards), and add a list of nominators (e.g. selected

RA LMCs) and evaluators (e.g. members of AAM team). They can be invited by e-mail to access the web application, and they can be associated with the available categories by ticking the related check-boxes. They can also create, edit and remove awards within the categories, and it is also possible for them to see the Results (both the actual and the final after the deadline is over). They can add new criteria with the relevant weight (importance) and the max points (reference for the evaluators), or they can select them from the pool available from earlier categories and/or awards.

- Nominator: A nominator is usually representing a selected Regional Academy, and knows the instructors very well around them. So they can see the available categories and the awards within each. They can nominate one person for each category by filling out the personal and professional info (the criteria set up by the category manager) of the nominated person. They can also withdraw someone in special cases.

- Evaluator: Evaluators will see the categories and awards they are associated with, and they can list the nominated persons. They can evaluate any of them by clicking on the Evaluate button next to the person's name. (Those being evaluated at the moment by someone else are not displayed.) They will see a form similar to the nominator's one but they can enter values belonging to each criterion. By approving a value, it will be calculated in the total points with the relevant weight, but any value can be disapproved as well, if there is no document supporting someone's statements (e.g. certifications).

For 2012 the Instructor Recognition project was "reloaded". In close cooperation with community members from Romania, the Adriatics and Hungary we completed the restructuring and simplifying the process of NetAcad Excellence 2012 for the CEE/R/CIS. From November, 2011 to February, 2012 lots of new features were introduced & improvements were implemented, also most known issues & bugs were fixed by the enthusiastic development team of PONTIS Foundation. The most significant change in the process was the elimination of nominations in the Specialist categories. Each and every instructor of the region was automatically ranked based on predefined objective criteria, resulting in less human interaction. Providing proof of certifications was also made easier by requiring the use of the "Publish Credentials" feature of the Cisco Certification Verification Tool.

In mid-March the US/Canada Team indicated they would plan to leverage and use the web application to support the NetAcad Excellence process in North America. In late March a training session was provided for the US/Canada Team on how to use the tool. Technical assistance was also provided for them.

The results of the Instructor Recognition part of the NetAcad Excellence 2012 were officially announced in Split, Croatia. Based on feedback from the US team metrics should be changed in a way to recognize smaller academies with quality instructors and efforts. Nathalie has already started the coordination of this project, and

PONTIS is more than happy to provide the technological background and implement the necessary adjustments.

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