EUROPEAN STUDY PROGRAMME FOR ADVANCED NETWORKING TECHNOLOGIES (ESPANT)

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Abstract

In this article authors present main objectives and preliminary progress of the EU ERASMUS CD project: European Study Programme for Advanced Networking Technologies (ESPANT). Major novelties in the development of one year master curriculum long lifelong learning oriented, moreover, a very professional practical approach is addressed. The preliminary modules description and the comments form a resonance group (formed by academia and industry members) are also summarised.

Keywords - Higher education, long life learning, networking technologies.

1   INTRODUCTION

1.1   Description

In ESPANT, a one year postgraduate study programme of 60 European Credit Transfer System (ECTS) credits is addressed. The curriculum is tailored on students who obtained a bachelor degree in an IT related subject – computer science, multimedia, information engineering, telecommunication, etc. It is our aim to implement a bachelor level training programme. This means that the emphasis lies on operational objectives rather than on design and research topics.

To face the above mentioned project, institutions from Belgium, Spain, Finland, Portugal and Slovenia will study a modular programme and jointly developed, international in organisation and contents, presenting the integration possibilities between a number of selected topics.

The ESPANT programme is a competence based programme and is built around six modules: general system management, implementing real-time media, integrated security, mobile and wireless communication techniques, integrated network storage, and networking infrastructure. Each institution in the consortium implements one, two or three modules, which means that student mobility is essential to finish the complete study programme. This enhances the international and intercultural competences of the participants.

After finishing the project, the programme in advanced networking technologies will be implemented. The different modules are described in ECTS files which outline the study programme. Besides the ECTS files, competence cards for each teaching activity in the modules are produced, which are based on existing competence profiles. The study material is uniformly conceived in English. In a trial

period, the modules mentioned earlier will be taught using a test audience. The outcomes of this trial will be used to adapt the course material to the objectives of the modules. Once the programme is running in the participating institutions, several other institutions across Europe will be invited to participate in this study programme by copying and providing the different modules. Students on an Erasmus exchange programme are able to participate in the modules implemented by the guest institution.

In traditional study programmes, subjects are taught one after the other as if it were little islands. This approach gives students a firm basis in the different subject, but often they are missing the big picture. The interaction between different areas in the technological field is often lost in traditional study programmes. To give students the competences to integrate different networking technologies, an innovative teaching approach is needed, providing i) real world examples and case studies, ii) training have to take place in a realistic environment rather than an artificial lab setup, iii) operational competences, and iv) detached modules, in which the different areas in the study field are integrated in case studies and lab projects.

An advanced methodology is use to ensure that the aims and objectives of this project are addressed properly: A steering committee, formed by the leading persons of all the partners in the consortium, monitors the overall performance of the project. To ensure an independent quality control, an external quality coordinator supervising that the aims and objectives of the project are reached, A novel entity is also set up, the resonance group consisting of the different actors in the workfield, it controls the competences described for each module.

At the end of the project, it is expected that Institutions across Europe joined ESPANT being able to copy and implement one or more modules from the study programme. This enlarges the recruiting space and the flexibility of the study programme.

1.2 ESPANT main goals

One effect of the globalisation both in technology and in education is the need for well educated, internationally oriented, dynamic computer professionals in Europe. More and more, companies' computer networks cover a large region which typically stretches over different European countries. Facing challenges in these kinds of environments is only possible when computer professionals have the competences to communicate and cooperate with colleagues across Europe.

Despite the scarcity on the European labour market, a growing demand is recorded for these high educated employees.

Integration between the different technological areas is studied only superficially, if at all: students get a firm basis in the different subjects, but often they are missing the overall picture. To give students the competences to integrate different networking technologies, an innovative teaching approach is needed in teaching the integration of state-of-the-art networking technologies.

To face the gaps and issues mentioned above, institutions from Belgium, Spain, Finland, Portugal and Slovenia present the European Study Programme for Advanced Networking Technologies (ESPANT). The ESPANT study programme is modular and jointly developed, international in organisation and contents, presenting the integration possibilities between a number of selected topics. Besides integration issues, a range of possible applications are covered: security, infrastructure (usage and integration of routers, switches, firewalls), general system management, network storage, mobile and wireless communication, and real time media.

The proposal concerns a one year postgraduate study programme of 60 ECTS credits. The target group for the ESPANT Study Programme are students who passed a study programme of minimally 180 ECTS credits. The curriculum is tailored on students who obtained a bachelor degree in an IT related subject – computer science, multimedia, information engineering, telecommunication, etc. It is our aim to implement a bachelor level training programme. This means that the emphasis lies on operational objectives rather than on design and research topics.

The ESPANT programme is a competence based programme and is built around six modules: general system management, implementing real-time media, integrated security, mobile and wireless communication techniques, integrated network storage, and networking infrastructure. Each institution in the consortium implements one, two or three modules (depending on their expertise),which means that student mobility is essential to finish the complete study programme. This enhances the international and intercultural competences of the participants.

After finishing the project the programme in advanced networking technologies will be implemented. The different modules are described in ECTS files which outline the study programme. Besides the ECTS files, competence cards for each teaching activity in the modules will be produced, which will be based on existing competence profiles. The study material will be uniformly conceived in English. In a trial period, the modules mentioned earlier will be taught using a test audience. The outcomes of this trial will be used to adapt the course material to the objectives of the modules.

This makes it possible to start with the ESPANT programme very soon after the project has finished. Once the programme is running in the participating institutions, several other institutions across Europe will be invited to participate in this study programme by copying and providing the different modules. Students on an Erasmus exchange programme are able to participate in the modules implemented by the guest institution.

2   ORGANIZATION

2.1   Participant institutions

In this section a brief introduction to the participants is presented and their main expertises, concerning the ESPANT project, are highlighted.
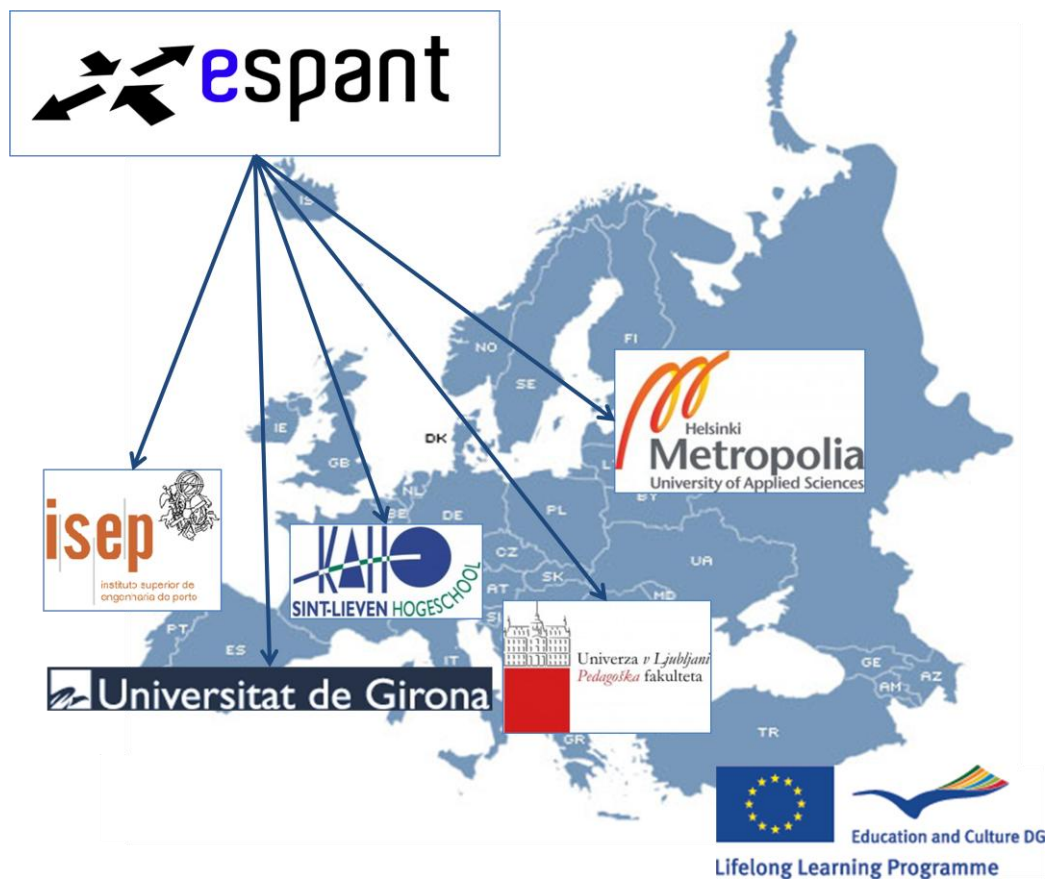
A.   KaHo Sint-Lieven, Gent, Belgium

KaHo Sint-Lieven is a university college offering bachelor and master degrees in 21 study programmes. The ICT department is active in student exchange, staff exchange and has participated in European projects in the past years. The ICT bachelor programme also is recognised as a Cisco academy and therefore has the necessary staff which is certified by Cisco (four CCNA and one CCNP). The necessary equipment for the CNAP training programme is available at the department's labs. Besides the Cisco academy, the ICT department covers courses such as system management (party supported using Microsoft course material), telecommunication, operating system, security, databases, etc.).

B.   University of Girona, Spain

The University of Girona covers Technical Science, Humanities and Social Sciences degrees. At the Escola Politècnica Superior (Polytechnic School), there are three Computer Science related studies; two 3-years specialities (bachelor equivalent level): Computer Systems and Software Engineering and a 2-years 2nd cycle of general Computer Science contents (master equivalent level). The University of Girona selected the degree in Computer Systems (bachelor equivalent level) as an advanced test bed in order to adapt the degree to the Bologna agreements. This has given us great experience in this kind of adaptations and new career design.

C.   Instituto Superior de Engenharia do Porto, Portugal

The Instituto Superior de Engenharia, Porto (ISEP) is an institution of research and teaching of engineering located in the city of Porto, Portugal. ISEP is currently integrated into the Polytechnic Institute of Porto (IPP) and delivers graduate, post-graduate and master courses in the various branches of engineering. With more than 6000 students and 400 teachers, it is one of the largest Portuguese faculties. It has several R & D units, which are active in the areas of Computer Graphics (synthesis of image in real time, real integration of image / synthetic and visual simulation of environments), Person-Machine Interaction (new paradigms of interaction between machines and their users), Virtual Reality / Visual Simulation (systems synthesis of image and interaction in real time and Learning Technologies (integration of technology in environments of teaching / learning and e-learning) which is a fundamental aspect of the ESPANT project implementation.

D.   Helsinki Polytechnic Stadia, Helsinki, Finland

Helsinki Polytechnic Stadia and EVTEK University of Applied Sciences merged into Helsinki Metropolia University of Applied Sciences on 1 August, 2008. The fields of study are: technology, health care and social services, economics and business administration, and culture. The related BEng Programmes in English are in Information Technology (IT), Media Engineering, Industrial Management (IM) and MEng programmes. The specialisation options of the BEng programmes are Networks and Infrastructure, Software Engineering and Telecommunications Engineering and in Master's programme Multimedia Communications and Software Engineering. The emphasis is on the integration of advanced and state-of-the-art networking technologies, such as security, infrastructure, general system management, network storage, mobile and wireless communication and real time media.

E.   University of Ljubljana, Slovenia

The University of Ljubljana is famous for its study courses in social sciences and humanities as well as in scientific and engineering fields. Faculty of Education of the University of Ljubljana is one of the most important institutions for the education of teachers in Slovenia with postgraduate and doctoral study programs. It provides also in-service training for teachers. Educational research and counselling are becoming its vital activities. Faculty of Education participates in many national and European research. Faculty of Education, University of Ljubljana has the expertise in curricula design and design of computer supported multimedia didactical materials for independent (distance) and blended learning in different fields. There are experts for most of the subjects in computer science education according to the IEEE/ACM computing curricula.

2.2   Organization and roles

The KaHo Sint-Lieven is the coordinator in the project both from the contents and the organisational point of view. An organisation structure was set up consisting of a **daily management cell** and a **steering committee**. These 2 teams work together to ensure a smooth management of the project.

The daily management cell ensures for the administrative and financial management of the project and presents a state of affairs on each general steering committee meeting. As for the coordination of the contents of the curriculum development, the coordinator of the project has the necessary expertise to offer state-of-the-art materials, which are regularly evaluated and tested by the **resonance groups**.

The daily management cell installed at KaHo Sint-Lieven is staffed with people who have already a management function in the institution: head of the ICT department and the head of the international affairs office. The people who reside in the steering committee are experienced managing small or large groups of people.

Each of the consortiums partners has strong links with industrial partners from the field of IT. This makes that installing a resonance group in each country can be performed by each of the partners in de the consortium. The consortium built around the ESPANT programme is made up of teaching and research institutions, which makes that every partner has the necessary know how to structure and implement study programmes. Also creating, testing, and adapting course material is a part of their daily busyness.

To ensure an independent quality control, an external quality coordinator is hired via subcontracting. This ensures that the aims and objectives of the project are reached, that the quality of the delivered output is outstanding, and that each partners in the consortium has enough involvement.

3 ESPANT PROPOSAL

3.1 Motivation

The need for well educated, internationally oriented, dynamic computer professionals is very high in Europe, considering that IT is one of the most globalised professions. These professionals are faced with complicated infrastructural problems in which the integration between different technological areas from computer science emerge. More and more, companies computer networks cover a large region which typically stretches over different European countries. Facing challenges in these kinds of environments is only possible when computer professionals have the competences to communicate and cooperate with colleagues across Europe.

Despite the scarcity on the European labour market, a growing demand is recorded for these high educated employees. Also the new European member states are economically and technologically developing very rapid, which increases the need for well trained computer professionals in these countries. It is of utmost importance that these countries technologically keep up with the 'traditional' European member states. Many European governments undertake actions to enlarge the number of students taking IT-related subjects in higher education.

In traditional study programmes, subjects are taught one after the other as if it were little islands. This is a very static way of teaching and the integration between the different technological areas is studied only superficially, if at all. This approach gives students a firm basis in the different subject, but often they are missing the big picture. The interaction between different areas in the technological field is often lost in traditional study programmes. To give students the competences to integrate different networking technologies, an innovative teaching approach is needed based on the some principles (see Section 3.2). The main language used in the European Study Programme for Advanced Networking Technologies is English because it is the most important language used in computer science.

3.2 Aims and objectives

The main goal of this project is to develop an international curriculum which is as flexible and dynamic as possible. The latter is necessary to make it possible for students and teaching staff from different countries around Europe to participate in the ESPANT programme. The curriculum allows students to develop the necessary competences for the labour market, which enhances their employability. This is guaranteed by working together with experts from large industrial partners who help defining the competences which should be addressed during the study programme. Besides that, a thorough practical training with an operational background in mind is necessary.

It is the goal of the consortium to integrate different state-of-the-art networking technologies using real world case studies and practical training, which are executed in a real and professional environment. In this way the students sharpen their competences to cover difficulties which are encountered in real world networking configurations. Therefore an innovative teaching approach is implemented:

- **Real world** examples and case studies have to play the central role in educating the integration of state-of-the-art networking technologies.

- Training has to take place in a **realistic**, real world environment rather than an artificial lab setup.

- **Operational competences** rather than the reproduction of theoretical details have to play a central role.

- **Detached modules**, in which the different areas in the study field are integrated in case studies and lab projects, enhance the flexibility of a study programme.

- **Flexibility** is guaranteed by implementing six detached learning modules and educational novelties such as e-learning, video conferencing, distance learning, etc.

By making students more mobile they learn the large opportunities that the European Union brings along. The European Study Programme for Advanced Networking Technologies is built around six modules, which the students have to complete to finish the study programme successfully. This brings students at a short period in contact with different social and cultural environments. Also the group they work in changes within each module, which sharpens their interpersonal and intercultural competences.

4 COURSE MODULES

4.1 DESCRIPCION

The ESPANT programme is built around six modules: system management, implementing real-time media, integrated security, mobile and wireless communication techniques, integrated network storage, and networking infrastructure. Each module takes around four weeks in which students get practical training about the subject of the module. Each institution in the consortium implements one, two or three modules which implies that students have to travel around to finish the complete study programme. This enhances the international and intercultural competences of the participants. Because not every institution has all the necessary expertise and peripherals to educate all the different modules, an extra effort of the teaching staff is expected. Different solutions are possible using distance learning, video conferencing or teachers' exchange.

After finishing the project a firm, competence driven study programme in advanced networking technologies will be implemented. The different modules will be described in ECTS files which outline the study programme: the detailed content of the module, the competences addressed, the number of credits which can be earned, the institutions in which the module is taught, the training methodologies, the manner of examination, the start and ending dates, etc. Besides the ECTS files, a competence cards for each teaching activity in the modules will be produced, which are based on existing competence profiles. Finally the study material for the modules General System Management and Real-time Media are completed, which are uniformly conceived in English. In a trial period, the two modules mentioned earlier will be taught using a test audience. The outcomes of this trial will be used to adapt the course material to the objectives of the modules. The study material produces will be used as a model for developing future training courses.

In the follow up of this project the study material of the remaining modules will be completed and tested. This makes it possible to start with the European Study Programme for Advanced Networking Technologies very soon after the project has finished. Once the programme is running in the participating institutions, several other institutions across Europe will be invited to participate in this study programme by copying and providing the different modules.

In the course of the project, other related outputs are: a project website both as a development instrument and a dissemination tool, 3 reports from the resonance groups with the field of work, 2 reports of the external quality evaluator of the ESPANT project.

4.2 Methodology

During the creation of the output of the European Study Programme for Advanced Networking Technologies (ESPANT) the consortium identified the following milestones sorted in (time):

1. A detailed description of the subjects has to be created for each of the six modules - system management, implementing real-time media, integrated security, mobile and wireless communication techniques, integrated network storage, and networking infrastructure. The subjects have to be subdivided in teaching activities, which as a hole form a module.

2. For each module an ECTS file is created containing the following information: the detailed content, the competences addressed, the number of credits which can be earned, the

institutions in which the module is touch, the training methodologies, the manner of examination, the start and ending dates, etc.

3. For every teaching activity in each of the modules a competence files is created. This is performed consulting industry experts.

4. The course material for the modules General System Management and Implementing Real-time Media are conceived.

5. The latter two modules are scrutinized using a testing audience.

6. After the testing period, the study material of the General System Management and Implementing Real-time Media modules are updated and adapted to the comments of the testing audience.

7. To ensure that the aims and objectives of this project are addressed properly, the following quality structure is set up:

8. At KaHo Sint-Lieven a management cell is installed which performs the daily management of the project. The latter involves triggering the dates for meetings by sending the invitations to the partners in the consortium; leading the meetings and making reports of them.

9. A steering committee is installed which is made up of the leading persons of all the partners in the consortium. The steering committee monitors the overall performance of the project.

10. To ensure an independent quality control, an external quality coordinator is hired via subcontracting. He/she makes sure that the aims and objectives of the project are reached, that the quality of the delivered output is outstanding, and that each partners in the consortium has enough involvement.

11. At each country involved in the consortium, a resonance group consisting of the different actors in the work field, is brought together. This group controls the competences described for each module.

4.3 Target groups

A first and very important target group are the bachelor IT students from the partners in the consortium. The numbers of students in bachelor IT programs or education programs in IT are very substantial in the 5 partner institutions and are more than 500 students.

The second target group is the visiting Erasmus Students coming from European partner institutions to one of the 5 partner institutions. Again the number of these students is substantial, more than 100 students annually.

A last target group, there are the students from the members in the European networks which the consortium has connections with. It is impossible to estimate the number of students in this group.

The students of the partner institutions in the consortium are invited to follow teaching activities in the modules implemented by the consortium's partners. This brings them in contact with the material and the international environment of the European Study Program for Advanced Networking Technologies.

Visiting Erasmus students are able to follow the modules implemented in their guest institution. This enhances their skills and brings them in a first contact with the study program. At their home institutions the Erasmus students distribute the information on ESPANT, which enlarges the visibility of the complete study program. It is impossible to estimate the number of students reached using this strategy, but mouth to mouth advertising is known as a very efficient instrument.

The students of the network partners are informed via the international affairs offices of the respective institutions. This will be implemented using a mailing campaign and the supporting web site. On this website the possible attendants can find among others a general explanation of the study program, the detailed ECTS files, the countries implementing the different modules, the starting dates of the different modules, links to the cooperating institutions, etc.

The identified short term target groups specifically the students of the partner institutions, visiting Erasmus students, and students affiliated to partners of European networks are also a target on the

long term. It will give the participating consortium members an extra PR value while recruiting youngsters for their own study programmes.

Institutions across Europe will be asked to join the European Study Programme for Advanced Networking Technologies. They are able to copy and implement one or more modules from the study programme. This enlarges the recruiting space and the flexibility of the study programme.

When the European Study Programme for Advanced Networking Technologies is known across Europe, the working students and employees who want further training become an important target group. By extra training they enhance their usability for the company they work for, which on its turn enhances the employability of the companies staff. For this group of people it is interesting to follow only a subset of the modules or spread them in time. Therefore it is important that other European institutions adopt the study programme and provide there modules at different periods in the year.

How will this group / these groups be reached?

The groups identified as short term target groups, are still reached in the same way as described above:

- Allow students to follow teaching activities within the modules implemented by the home institution

- Allow Erasmus students to follow the modules implemented by the guest institution

- Informing students of partner institutions concerning European networks

Each member in the consortium invites other institutions to copy and implement a subset of the study programme. The new partner have to have the necessary expertise and peripherals to implement these modules. By implementing a subset of modules, the new member participates in the European teaching area which enlarges the name of the European Study Programme for Advanced Networking Technologies. This of course, reflects on the size of the population from which the study programme is able to recruit. Also the number grows of Erasmus students who are able to follow modules in their guest institution.

Employees who are interesting to update their networking knowledge or who simply want to ensure their employability, are able to follow the study programme as well. By implementing detached modules, the study programme is in such an extend flexible, that it is easy to for working students to participate in the European study programme. Also it is possible for them to spread the programme in time or finish only a subset of the modules (depending on their interests). It is the responsibility of the local implementers to reach companies and their employees: organisations of self-employed people, employers organisations, the institution's industrial partners, etc. Here the website for the study programme helps to support this dissemination campaign.

- After the end of the ESPANT project, the partner consortium will continue to offer this international course as a postgraduate modular course, and it will be included as such in the institutions' course catalogues and study offer.

- The course will consist of a 60 ECTS credit programme leading to a postgraduate certificate which will be a joint certificate signed by the legal representatives of each partner institution. It will be explored when the programme is running if it can be expanded to a joint degree programme.

- The programme will be open to students from institutions out of the consortium, and the website will continue to exist after the programme to be able to act as an information and recruitment instrument.

- Finding good employees in the IT busyness will still be an issue for a long time. The impact of this study programme will be to deliver the well educated employees with the necessary competences wanted by the industry.

5 MODULES SYLLABUS

In this section the contents of the modules defined in initial meetings and presented to the resonance groups (see Section 6) are synthetically presented.

5.1. Module 1 – Network Infrastructures

A. NETWORK INFRAESTRUCTURES: TECHNOLOGIES

- 1.1. Main Concepts and types of networks
- 1.2. Data communications
- 1.3. Circuit Switching and Packet Switching
- 1.4. Quality of Service and Cell based switching

B. NETWORK INFRAESTRUCTURES: INTERNET

- 1.5. Internet protocol basics
- 1.6. Internet Protocol (IP) layer
- 1.7. Transmission Control (TCP) layer
- 1.8. Internet basic services
- 1.9. Basic network management

5.2. Module 2 - Security

A. BASIC NETWORKING SECURITY TECHNIQUES

- 2.1. Concepts and definitions of security
- 2.2. Basics of network security
- 2.3. Threats to communication networks
- 2.4. Principles of encryption
- 2.5. Integrity
- 2.6. Access control
- 2.7. Freshness

B. PRACTICE OF NETWORKING SECURITY TECHNIQUES

- 2.8. Implementing encryption in networks
- 2.9. AAA – Authentication, authorization, accounting
- 2.10. Specific security issues
- 2.11. Protection of Networked Systems

5.3. Module 3 – Wireless Communications

A. INTRODUCTION TO WIRELESS COMMUNICATIONS

- 3.1. Main concepts of wireless communications
- 3.2. Mobile communication systems
- 3.3. Satellite communication

B. WIRELESS COMMUNICATION

- 3.4. Wireless networks

5.4. Module 4 – Network Storage and IT Quality Aspects

A. INTRODUCTION TO STORAGE SERVER TECHNIQUES

- 4.1 General background about Network Storage
- 4.2 Storage Networks
- 4.3 Database Storage and Design
- 4.4 Introduction to Quality management

B. ADVANCED STORAGE SERVER TECHNIQUES

- 4.5 Performance Optimization
- 4.6 Concept of content switching
- 4.7 Remote management issues
- 4.8 Disaster Recovery

5.5. Module 5 – Real time Multimedia

A. MULTIMEDIA COMPRESSION, STANDARDS AND TOOLS

      5.1.   Main concepts of digital picture and video

      5.2.   Main concepts of speech and audio standards and tools

      5.3.   Main concepts of audio standards and tools

      5.4.   Quality of Service and Cell based switching

B. REAL-TIME MULTIMEDIA DELIVERY

      5.5.   Video streaming servers

      5.6.   Digital TV / HDTV broadcasting environment

      5.7.   Mobile-TV systems

      5.8.   IP-TV

5.6. Module 6 – System Management

A. BASIC SERVER ADMINISTRATION

      6.1   Windows server administration

      6.2   Linux Server Administration

      6.3   Integrated environments (Linux/Windows)

B. SYSTEM ADMINISTRATION: PRACTICAL APPROACH

      6.4   Concepts of Virtualization

      6.5   High Availability

      6.6   Disaster Recovery

      6.7   Server Performance Optimization

6 RESONANCE GROUPS

6.1 Objectives and composition

The resonance groups are formed by alumni, experts and practitioners from leading companies. The role of these groups is to look at the detailed structure of the study programme – consisting of the modules, the subjects and the teaching activities and produce recommendations considering the target group and the objectives of the programme through a professionally-oriented approach.

Resonance groups were asked to:

1. Evaluate the programme as a whole and ...

    a. Identify areas that were not fully covered by the programme

    b. Identify areas that could benefit from a larger emphasis in the programme

    c. Identify areas that were covered by the programme but are not especially relevant

    d. Identify competences that were not fully developed by the programme

2. Pick one or two modules where their expertise is central and

    a. Identify topics, technologies, tools that were not fully covered or not explicitly mentioned

    b. Identify topics, technologies, tools that could benefit from a larger emphasis

    c. Identify topics, technologies, tools, that were covered by the module but are not especially relevant

    d. Assess the correctness of the proficiency level for each sub-topic, that is, the level of knowledge that it is expected the student acquires for that sub-topic

The proficiency levels followed Blooms' taxonomy recommendation [1]:

- Remembering - Recognising, listing, describing, identifying, retrieving, naming, locating, finding

- Understanding - Interpreting, Summarising, inferring, paraphrasing, classifying, comparing, explaining, exemplifying

- Applying - Implementing, carrying out, using, executing

- Analysing - Comparing, organising, deconstructing, Attributing, utlining, finding, structuring, integrating

- Evaluating - Checking, hypothesising, critiquing, Experimenting, judging, testing, Detecting, Monitoring

- Creating - designing, constructing, planning, producing, inventing, devising, making

6.2   Initial feedback

Resonance group experts worked independently or in group according to their availability. The initial feedback was highly positive concerning the structure and organization of the course and modules. Therefore, we could say that all relevant areas are satisfactory covered by the programme and that all important competences are developed by the programme.

In general we could conclude that the proposed programme provides quality education through developing student's ability to interact, learn, and solve problems using modern computational tools and techniques.

Some relevant comments and suggestions helped to better define specific aspects of the modules' scope. Important references were also suggested by the resonance groups.

7   CONCLUSIONS

The EU ERASMUS CD project: European Study Programme for Advanced Networking Technologies (ESPANT) has been introduced. Its main objectives has been summarised as well as the methodology to carry out the involved tasks. As this is a work in progress still at it initial developments, preliminary progress in the definitions of the teaching modules contents has been shown. The preliminary comments from resonance groups at each institution encourage us to follow the methodological phases as planned.

8   REFERENCES

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