ALGEBRA GRUPA

RAČUNARSTVO
visoka škola

SELF-EVALUATION REPORT 2010

University College for Applied Computer Engineering

Self evaluation report was prepared by Committee for Quality, Dean and Managing Board, accordingly to NVAO Assessment Framework.

This is internal document detailing present state of affairs in respect to institution's internal quality assurance system. This report is appended with additional documentation as stated in NVAO Assessment Framework.

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Zagreb, 03.09.2010.

Preface

This self-evaluation report was prepared as a part of a Pilot project in quality assessment and enhancement in professional higher education institutions in Croatia, launched in March 2010 and financed by the Flemish Government within the co-operation programme between Flanders and Central and Eastern Europe.

Three main objectives of the Project are as follows;

- The first one is focused on the transfer of know-how from Flanders to Croatia and intends to support the development of the internal quality assurance systems in professional higher education institutions in Croatia. This objective will be realized through the provision of expertise on the process of institutional self-evaluation, quality assessment and certification, the development of internal quality assurance guidelines and the presentation and exchange of best practices from Flanders and the Netherlands.
- The second dimension of the project is institutional assessment, including the accomplishment of external institutional audits. These will be organized by NVAO and supported by ASHE. As a result of the self-evaluation process and the external institutional audits, for each of the partner institutions, an assessment report will be published by NVAO, as well as and a number of system-wide recommendations.
- Finally, the third dimension of the project consists of wider knowledge transfer to Croatian stakeholders in order to build closer ties in quality assurance and certification procedures between Flanders and Croatia.

University College for Applied Computer Engineering planed and proposed the Project application to Flemish Government and assembled other project partners and promoter (NVAO) in order to support its internal strategic orientation towards development of holistic and robust internal quality control system that is also internationally comparable. In that respect, we see this self-evaluation report as a snapshot depicting current state of affairs in internal quality control system, taken during the early stage of institution's development. Experience gathered in the course of this project will certainly serve as an asset in future development of our institution and its perspective towards quality.

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List of Acronyms and Abbreviations

ASHE	Republic of Croatia - Agency for Science and Higher Education (hrv. AZVO)
ASIIN	Accreditation Agency for Degree Programmes in Engineering, accredited by the German Accreditation Council (Akkreditierungsrat)
CCE	Croatian Chambers of Economy (hrv. HGK)
CEA-ICT	Croatian Employers' Association in ICT (hrv. HUP-ICT)
CES	Croatian Employment Services (hrv. Hrvatski zavod za zapošljavanje)
CCUUCAS	Croatian Council of Universities and University Colleges of Applied Sciences
CROSTAT	Croatian Bureau of Statistics (hrv. Državni zavod za statitstiku)
DG	EU Commission - The Directorate General responsible for (i.e. Education and Culture, Energy,…)
EQF	European Qualification Framework
ETF	European Training Foundation
EUCIP	European Certification of Informatics Professionals - www.eucip.com (by CEPIS)
FER	University of Zagreb, Faculty of Electrical Engineering and Computing (hrv. FER)
IPA	EU fund; Instrument for Pre Accession, available for "candidate countries" based on acquis communautaire
ISVU	Information system for higher educational institutions (hrv. ISVU - Informacijski Sustav Visokih Učilišta)
Kn	Croatian national currency – Kuna; current exchange rate is app. 7,2 kn for 1 EUR
KPI	Key Performance Indicator
LMS	Learning management system – infrastructure for e-learning
MOSES	Republic of Croatia - Ministry of Science, Education and Sports (hrv. MZOŠ)
NVAO	Nederlands - Vlaamse Accreditatieorganisatie (Accreditation Organization of the Netherlands and Flanders)
OECD	Organization for Economic Co-operation and Development
UCACE	University College for Applied Computer Engineering (hrv. VŠPR)

1. INTRODUCTION AND CONTEXT

1.1. Introduction

University College for Applied Computer Engineering was founded on 7th of July 2008 by Algebra ltd, leading private IT adult educational institution in Croatia, active on the IT educational market for more than 12 years in 20 towns in Croatia and Bosnia and Herzegovina. Algebra currently supports more than 30 out of 50 biggest Croatian companies in different aspects of IT education, and in recent years it published some 30 different IT related books and e-learning issues, sold in more than 200.000 copies.

Process of initial accreditation of educational program was conducted by National Council for higher education[1] under the jurisdiction of MOSES and was finished on 16th of Jun 2008 upon which UCACE was awarded with the temporary Accreditation for organization and pursuance of professional higher educational program; Applied computer engineering[2]. UCACE was founded as Non for profit private higher educational institution, according to the Act on Scientific Activity and Higher Education (Official Gazette 123/03 with amendments 198/03, 105/04, 174/04 and 46/07) and Act on Institutions (Official Gazette 76/93 with amendments 35/08). Initial location used to launch the institution was the headquarters of Algebra group in Maksimirska 58a, Zagreb. UCACE is today located within University Campus complex in Ilica 242, Zagreb and its location is formally changed in all legal documents. On 14th of July 2010 UCACE was awarded with the permanent Accreditation for its study program and will be regularly assessed by ASHE as defined in Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09). First generation of students started in UCACE their Bachelor education program on 7th of October 2008.

1.2. History and recent developments

Accordingly to the recognized trends and employment needs of IT educated specialists, work on UCACE program started in 2006 by Program Committee and external consulting experts. During the process, two extensive surveys of employers in IT were conducted by IDC Adriatics[3] and "Moj-Posao.net"- most important private employment portal, showing detailed market requirements. Portal "Moj-Posao.net" made available their complete database of announced vacancies in the past 7 years in the field of IT and computing, in order for the Program Committee to get clear picture of overall market requirements in wider context. IDC's survey, covering 80 most significant employers of ICT experts (out of which; 12,5% IT distributors, 30% financial institutions, 7,5% ISV's, 20% public institutions, 5% production companies, 7,5% system integrators, 5% telecom operators, 5% development companies and 7,5% others) yielded detailed analysis of technologies used by IT employers as well as skills and knowledge required by the market. As a result of both inputs and extensive work of experts and Committee members, a first draft of the program structure was prepared. During the second half of 2007 program draft was discussed with CIO's and other ICT experts in order to harmonize its content with variety of different market needs (public vs. private companies, small companies vs. big enterprises, open source vs. proprietary technology…). Program was further developed according to ASIIN[4] requirements (Recommendations for *More Application-Oriented Informatics Study Programs - Type II* rev. 18.03.2005.), and final version was fine tuned in close cooperation with team of academics from University of Zagreb, Faculty of electrical engineering and computing – FER in late 2007 and at the beginning of 2008.

First generation of students on UCACE started their education in 2008 using three classrooms / laboratories equipped with computers and other equipment available in Maksimirska 58a and two lecture rooms and library on FER, located in Unska 3, Zagreb. During that time UCACE students did not experience problems due to courses held on two locations because their time schedule was prepared in a way that each day they had all lectures on the same location. Still, UCACE management was dissatisfied for not being able to foster development of true academic spirit and institution's identity while working actually in the premises of two other well established institutions. Solution to this problem came in July

[1] **National Council for higher education** – www.nvvo.hr
[2] http://www.racunarstvo.com/Uploads/dokumenti/Dopusnica1.gif
[3] **IDC Adriatics** - http://www.idc-adriatics.com/
[4] http://www.asiin.de/english/download/crit_tc4.pdf

2009 when contract was reached to rent more than 800 m^2 of excellent educational premises in Ilica 242. During the summer of 2009 new furniture and equipment was purchased and decoration works were undertaken in order to fully setup new facility to UCACE purposes. UCACE started its second academic year on 21st of September 2009 in new premises and with the new Dean appointed by Professional council and approved by Managing board, as per article 23 of UCACE Statutes[5].

In February 2009 UCACE assembled partners and prepared the application for Pilot project in quality assessment and enhancement in professional higher education institutions in Croatia, financed by Flemish government within Cooperation Program for Central and Eastern Europe. Project commenced in March 2010. At the end of 2009 UCACE assembled partners and prepared grant application for significant project in development of VET Curriculum for IT and computing under the IPA for the Human Resources Development Component in Croatia 2007-2009. Project was elected for financing in August 2010 and the contract will be signed in September 2010.

1.3. Location and facilities

UCACE is today situated in some 100 years old, newly decorated and fully equipped building within University Campus complex in Ilica 242, Zagreb. UCACE facility consists of more than 1000 m^2 of acclimatized rooms available for students and staff, each within the reach of fast wireless internet and fully accessible to persons with disabilities. Teaching process is organized in 2 lecture rooms (70 and 42 seats) situated on ground and first floor respectively, 3 fully equipped PC classrooms (18 – 26 seats), 2 laboratories for network technologies (each of 18 seats) and 2 multipurpose classrooms (10 and 14 seats), all on the ground floor. Students can also use career centre, student office, spacious lounge area, and library equipped with PC's for self study and demonstrational server and networking equipment for exercise, all situated within the same building. Café' and cantina for students and staff, spacious parking lot and dormitory are located within the campus.

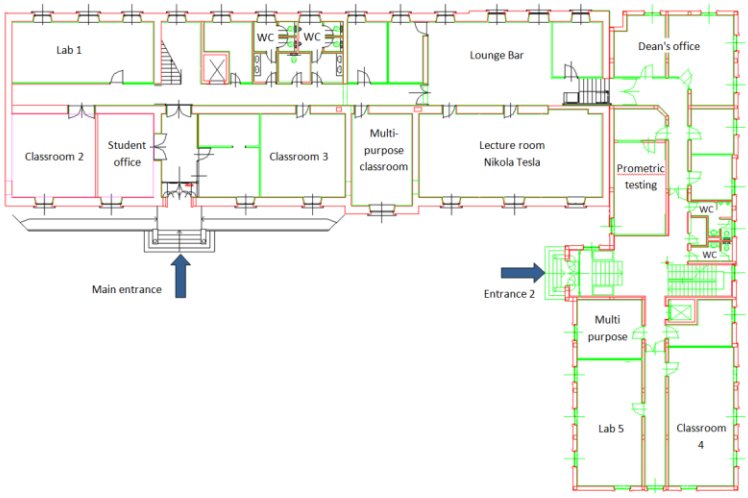

Figure 1. – Ground floor plan of UCACE premises

Offices for teachers and other staff are located on the ground floor and on the second floor. Teachers and assistants are situated in smaller offices for one to three persons while other staff uses bigger offices as per organizational unit (i.e. Marketing, department for administration and support to the teaching process,…). Heads of organizational units have its' own offices.

1.4. Program

To this end, UCACE holds Accreditation for one undergraduate professional higher education program; Applied Computer Engineering with two sub specializations; System Engineering and Software Engineering. Program is accredited with 180 ECTS points, lasts for 6 semesters in total of 3 years and graduated students are awarded notion *Bachelor of Applied Computer Engineering* (hr; bacc.ing.prim.rač.). Students have 6 subjects on each of first 5 semesters and 4 subjects plus diploma

[5] Statutes: http://www.racunarstvo.com/Uploads/dokumenti/statut%20VPR.pdf

project on 6th semester. Total duration of the education in each semester is 15 weeks with educational load of app. 23 school hours of direct education weekly. During the semester there are 2 midterm exams (first after 5 weeks of education and the second after 10 weeks of education). For the purposes of midterm exams, there are 2 weeks off during the semester for each midterm (total of 4 weeks) so each semester lasts for 19 – 20 weeks.

There is a total of 50 courses within the program out of which 14 are electives. Courses are organized in 6 departments as follows:

1. Software engineering dpt. - 15 courses, 8 teachers
2. Operating systems dpt. – 6 courses, 5 teachers
3. Department for general courses – 12 courses – 11 teachers
4. Computer networks dpt. – 5 courses, 3 teachers
5. IT security dpt. – 4 courses, 2 teachers
6. Department for information systems – 8 courses, 10 teachers

Structure of the program in respect to ASIIN recommendations:

Field	Recommended	System engineering	Software engineering
Applied computing and IT	40%-60%	50,56%	52,22%
Mathematics, natural sciences and basics of engineering	15%-20%	18,33%	18,33%
Ergonomic, law and communication	5%-10%	9,67%	7,22%
Economy and management	5%-10%	6,67%	6,67%
Specialization within computing and IT and final project	15%-25%	14,78%	15,56%

Table 1. – Program structure

Program was prepared in a way that students enrolled in any of the available sub specializations are able to get bachelor diploma and gain knowledge to pass most significant IT certification exams, recognized by the industry, just following the formal courses. This was mandatory requirement excerpted during the program preparation, which modeled the program, courses and courses interconnection significantly. From the students' perspective, certification exams are available extra benefit already calculated in the admission fee. Aforesaid exams are relatively easily passed by most of the students after they finish respected courses and pass formal course examination conditioned by learning outcomes. Index of available IT certificates and exams is clearly listed each year in call for admissions and is regularly updated.

More details regarding the program and the courses are available on http://www.racunarstvo.com

1.5. Students

UCACE got its program accredited relatively late to organize quality promotion campaign for admissions in 2008/2009. Public presentation of new institution was held on 18th of July 2008 and first entrance examination was organized in the last days of August 2008. In these circumstances, admission of 64 students in 2008 was more than most anticipated, especially having in mind that UCACE's admission fee was one of the most expensive for IT and computing programs and that Croatia had, and still have, free studying on public institutions. Most of the students enrolled in 2008 were adult, already employed students attracted by Algebra brand that was not so popular in high school population during that time. In 2009/2010 UCACE enrolled total of 75 students and emphases moved to high school graduates, with still relatively high proportion of adults. In 2010/2011 we expect the same or similar number and structure of enrolled new students due to severe economic downturn in Croatia and significantly raised quotas for free studying on public institutions presented recently within the campaign "Free first year for all". There is a total of 123 students enrolled today, out of which 50 on second year and 73 on first year. Structure of enrolled students is as follows:

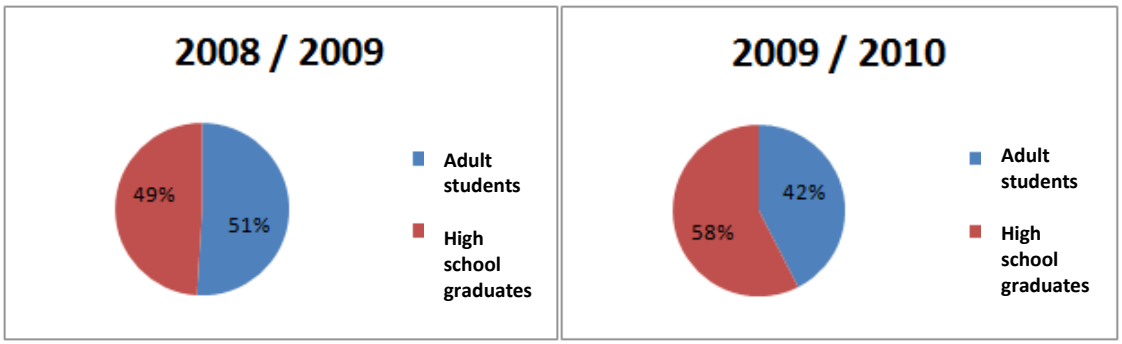

Figure 2. – Structure of newly enrolled students in last two years

First year			Second year	
adult students	**31**		**adult students**	**26**
Software engineering	12		Software engineering	4
System engineering	19		System engineering	22
high school graduates	**42**		**high school graduates**	**24**
Software engineering	27		Software engineering	10
System engineering	15		System engineering	14

Table 2. – Current structure of enrolled students

Today there is xx % of male and yy% of female students, zz% finished grammar school, tt% finished VET program in duration of 4 years, zz% finished VET program in duration of 3 years and qq% of students already finished other degree program.

For any higher educational institution, quality and predispositions of enrolled freshman students are of topmost importance. Being new private institution without already established and trusted brand, operating together with respected and quality public institutions offering free programs, put even stronger burden on institution and emphases on student quality. Guided solely by this fact we introduced total of 25 - 30% scholarships this year in order to attract high quality students in order to build positive and competitive atmosphere within student new population.

1.6. Staff

UCACE has a total of 30 employees in 6 organizational units (sectors) each consisting of sub units (departments) as per organizational scheme (Appendices 1). Some of the employees are also employed in other parts of Algebra group (cumulative employment). There are 7 full time employed teachers and 4 full time employed assistants. Courses are also conducted by 30 part time teachers and 13 part time assistants.

1.7. Funding

UCACE's founding originates from tuition fees, development and research projects and financial support from Algebra group.
Annual tuition fee has been unchanged from 2008 and it ranges from 31.000 kn for single payment to 33.400 kn for up to 12 monthly instalment payments. For the past two years there have been additional discounts for single payment or bank loans, so annual fee in these cases was reduced to 28.830 kn as publicly announced on UCACE's web page, call for admissions and printed official documents. Bank loans provided to the students are specially tailored for the purpose, upon bilateral agreement between UCACE and Unicredit Bank (Zagrebačka banka). They are unique for their low interest rates (same rates as for real estate), 3-4 years of grace period, long repayment period (up to 10 years) and no payment assurance burden. Tuition fee is further reduced for students who have already passed similar exams on other higher educational institutions, if these exams are acknowledged by UCACE. Fee reduction is calculated per ECTS points, as per article 13 of Book of regulations on Study[6].

[6] http://www.racunarstvo.hr/Uploads/VŠPR%20pravilnik%202010_2011.pdf

In order to better support its students, UCACE raised one full 3 year scholarship in 2009/2010 (paid by Jutarnji list) and three full 3 year scholarships in 2010/2011 (paid by; PBZ, APIS-IT and Economic Council members). Also, to promote excellence and successful studying, UCACE awarded three partial (up to 20%) scholarships to best 1st year students last year, and will award up to eight partial (up to 30%) scholarships to best 1st and 2nd year students, this year.

Average annual fee paid by fee paying enrolled students in 2009/2010 was 25.500 kn. UCACE's sources of funding, expenses and balance are as follows:

	Per academic year		Per year		
	2008/09	2009/10	2008	2009	to 30.06.2010
INCOME					
Student tuition fees total					
Students and parents directly					
Students and parents bank loans					
Companies					
Projects an other income total					
Total	**1.685.477,00**	**3.056.940,42**			
EXPENSES					
Facility costs total					
Rent					
Utility services					
Staf total					
Salaries for employees					
compensations for external teachers					
production of training materials					
IT and infrastructure					
Sales and Marketing					
Other costs					
Total	n.a.	n.a.			
BALANCE	n.a.	n.a.			

Table 3. – Balance sheet for past period

Stated Algebra's financial contribution is not shown in the Table 3, because it has been carried out through financing of educational courseware development. Actually, Algebra as publisher prepared and financed almost all courseware (especially books) and invested more than 1.500.000 kn in the past two years. Books were prepared especially for UCACE, and development was organized and managed by joined production team. Algebra holds all legal and publishing rights on all prepared books and they are delivered to UCACE as requested.

1.8. The Mission

UCACE was established with sole purpose to organize and conduct professional higher education in the field of computing and ICT, as stated by article 9 of its Statutes. We at UCACE are well aware of our responsibility in a wider social context and therefore through our work we actively foster education and especially one in the field of technical sciences, as a foundation to competitiveness growth and economic development of national economy. By doing so, we strive to build value system coherent to values in which we strongly believe through:

- Organization and pursuance of public campaigns promoting ICT literacy and expertise;
- Gathering of information, analysis and research in the field of ICT as a basis for social and policy development;
- Support to formal educational system in Republic of Croatia, and especially VET system;
- Active work within nongovernmental sector and employers association,
- Active work within EU and global initiatives fostering development of national economy and educational system (OECD, ETF, …);
- Fostering of e-skills and other basic competences for Life log learning stated in EU policy and development strategic outlooks;
- Cooperation with institutions and society of persons with disability in order to foster their social inclusion and employment;
- Activities fostering international cooperation, research and mutual projects;

- Cooperation with employers and especially ICT employers in order to educate work force capable of achieving and maintaining competitive advantage of national economy;
- Attraction of foreign direct investments and project significant for development of national economy;
- Fostering of holistic approach towards quality in education on any level (from high school to higher and adult);

I order to fulfill goals and conduct activates stated in article 9 of UCACE's Statutes and in aforesaid paragraph, strategic development decisions are taken, material and technical resources are assured, internal quality assurance system is being developed and close contacts and cooperation with business sector and employers are maintained. Furthermore, UCACE fully supports career development of its students through activates of internal Career centre and its Economic Council.

To support above stated activities, integral information system is being developed together with IT infrastructure for assessment and e-learning, and facilities, equipment, learning resources and overall capacity is being built in order to provide prerequisites for high quality study.

1.9. The Vision

University College for Applied Computer Engineering aims to become first choice of Croatian and regional students interested in professional higher educational programs in the field of computing and ICT, through development of excellence in all aspects of institution's work, its infrastructure, staff, cooperation with the industry and international activities.

1.10. Strategic aims

In order to better structure and organize educational and other activities in accordance with its mission and vision and to foster stabile development of its future position, six broad strategic objectives were stipulated by UCACE's Development Strategy for 2009 – 2013 period (Strategy), accompanied with measureable KPI's and detailed action plan . They are:

1: Establish high quality educational process based on learning outcomes principles, supported by adequate training materials and methods with curriculum fully respecting market requirements.

2: Develop such internal quality assurance system which can guarantee successful UCACE's accreditation and facilitate introduction of highest European standards covering all aspects of institution's activity.

3: Establish such Human resources development model which can assure UCACE's further sustainable development and fulfillment of other strategic goals.

4: Build high quality infrastructure in order to assure excellent study prerequisites and maintain high student standards.

5: Initiate and organize new study programs in Computing and ICT field.

6: Establish and maintain full cooperation with employers and the industry in order to contribute to society and consequently national economy.

1.11. Quality assurance

Private higher education started in Croatia less than a decade ago and is still considered by many as low quality and insignificant educational segment. To this end, with 26% of all higher educational institutions being private, enrolling some xx% of total student body, it is safe to say that private higher education still did not fully catch up in Croatia. If reasons behind aforesaid position are analyzed in more detail, three main groups should be closely considered:

1. There is indeed lack of knowledge, experience and sometimes brother vision and recognition of social responsibility in some private higher educational institutions.
2. After some 55 years of socialist regime and significant privatization scandals in 20 years of recent Croatian history, any kind of private business and especially private education is still stigmatized by many.

3. Private institutions are cohabitating with public ones, sharing same legal environment which is fully in favor of public institutions; students in private institutions do not get any support from public budget like their colleges studying in public institutions (health insurance, subsidized food and accommodation costs,…), they are paying tuition fees while studying in public institutions is now free for all students, and finally private institutions are not supported from the state budget but instead they are obliged to pay 5% of their total market income to the government in order to support public higher education system.

Being fully aware of all aforesaid circumstances, we at UCACE trust that only dedicated and holistic approach to quality of our overall work and education that we provide can help us survive these turbulent and sometimes hostile times. We also know that time left to establish public trust and to build excellence in all aspects of our work is limited due to near Croatian accession to EU and consequent arrival of internationally established and advanced foreign competitors.

These external facts, combined with our intrinsic strive towards excellence, the same one that made Algebra market leader in adult ICT education for the past decade, made constant quality enhancement our most significant goal.

2. METHODOLOGY USED TO PREPARE THE SELF-EVALUATION REPORT

2.1. Introduction

This self-evaluation report was prepared as a critical reference to institution's organization and implementation of internal quality assurance system upon NVAO's Guidelines for structuring the self-evaluation report. During the course of its preparation and prior to that, some management board members and members of Quality assurance Committee scrutinized in detail; NVAO's Assessment framework, Croatian Act on quality assurance in science and higher education, AZVO's Instructions for preparation of self-evaluation reports and self-evaluation framework[7], Standards and Guidelines for Quality Assurance in the European Higher Education Area (DG Education and Culture), ASHE's annual report for 2010, Quality Handbook of Križevci College of Agriculture (Developed within Tempus project in 2008) and number of British documents prepared by Quality Assurance Agency (QAA). This extensive preparation activities helped UCACE's experts to add additional knowledge to one already acquired during workshops organized within Pilot project in quality assessment and enhancement in professional higher education institutions in Croatia, all in an attempt to prepare this document on acceptable quality level.

2.2. Involvement of internal and external stakeholders

This document was prepared in three phases. First phase of preparation was done by the Dean and the Head of Quality assurance Committee and it finished with transposition of questions stated in; chapters 1.3 and 1.4. of the "*Guidelines for structuring the institutional self-evaluation report"* and presentation "*Framework for self evaluation based on NVAO- & ESG standards"* held during the Zagreb workshop, to future self-evaluation report's contents backed up with original or rephrased questions. In the second phase, text of the report was prepared by the Dean, members of Management board and Quality assurance Committee, upon already set up contents and initial questions. Third and final phase actually involved discussion and review of prepared draft document by members of Economic Committee, Professional Council and students representatives.

Already existing internal documents ranging from policy documents to operating directions and available results of internal quality monitoring processes were used in order to complete this self evaluation. All critical self-assessment conclusions were stated without any restrictions whatsoever, and are considered by UCACE's managing structures as incentives for future institutional development.

[7] http://www.azvo.hr/Default.aspx?sec=352

2.3. Dissemination

Dissemination of prepared final report was done to internal and external stakeholders including; all members of Economic Committee (external), all members of Professional Council, all members of Quality assurance Committee, all members of Managing board and student representatives. This report is internal document and will not be published in its integral form but only as an abstract, in order to protect sensitive strategic information and development outlook from possible competitors. All quality related information included in the document will be published within the abstract.

3. INTERNAL QUALITY ASSURANCE

3.1. Vision of quality

As already stated in chapter 1.11. of this report, holistic approach and strategic orientation towards ultimate quality is the paramount goal of UCACE's management and employees. In that respect Management Board backed up with additional 10 members of Committee for Strategy developed in November 2009 Development Strategy of UCACE for period 2009 – 2013 (Appendices 2) including Policy for Quality Assurance in UCACE. That, second, strategy succeeded first short term strategy (2008-2009) developed in December 2008 by Management Board covering quality in 7 out of its 8 strategic goals. Abstract of recent Strategy (2009-2013)[8] is published on UCACE's web page showing all strategic goals, each strategic task and most of the KPI's (all KPI's concerning quality). Furthermore, in Jun 2010 Professional Council developed and adopted internal Book of regulations on Quality Assurance[9], detailing organization of Committee for Quality Assurance and area of operation for internal quality assurance activities. This document is public.

In UCACE's Policy for Quality Assurance (QA) it is stated that internal quality assurance systems are of topmost importance for institutions of higher education in order for students, employers and wider society to gain and maintain trust that the institution is conducting its educational activities in correct, transparent and socially beneficial manner for which it was entrusted public rights through institutional and program accreditation. It is so because higher educational institutions are in charge of the whole process form program and curriculum development through organization and pursuance of education to student assessment. In contrast to i.e. secondary educational system where programs are prepared and brought by the Ministry and evaluation of pupils' achievements are conducted by external organizations, internal quality control system is in charge of the whole process in higher educational institutions so it must be reliable and robust.

It is stated in UCACE's QA Policy that our future graduates should be prepared for new working conditions and new environment based on knowledge society paradigm (Lisbon and new Europe 2020 strategies), so quality of our programs and graduates' qualifications should be constantly upgraded, backed up with internal quality assurance system and set strategic goals.

In that respect, starting points for introduction and maintenance of internal quality assurance system are;

- Interest of students, employers and society to have competitive and high quality higher education
- Importance of institutional autonomy with the strong emphases on the understanding that there is a great responsibility attached to it

Vision of the quality described and defined in UCACE's QA Policy recognizes internal quality assurance system and quality culture of the organization as a complex instrument used to develop and maintain institution's responsibility to all (internal and external) stakeholders in order to establish their recognition and trust.

In its vision of quality, UCACE is fully aware of often negative perception of private institutions considered to be constituted for the sole purpose of profit generation for their founders / owners. Our value system is in complete contrast to such ideas and we therefore strongly incorporated public wellbeing and overall

[8] http//www.racunarstvo.hr/studij.aspx?id=1312
[9] http://www.racunarstvo.hr/studij.aspx?id=1310

benefits for the society in our strategic goals, backing it up with internal quality assurance measures and our KPI's on institutional level.

Furthermore, we at UCACE are familiar with speculations that private institutions of higher education, being financed mostly by tuition fees paid by their students, are in a way, in constant conflict of interests. Respecting entrusted public rights to serve in the best interest of the society, we are determined to strictly obey publicly announced assessment and other standards in order to build our graduates' careers in accordance with employers' expectations, making them fully employable and able to increase competitiveness of national economy. Holistic and well developed internal quality assurance system that is strictly applied is the single most important tool that will be used in order to avoid and discard any such possible speculations aimed at UCACE.

In its conclusion, UCACE's QA Policy stresses out that in present Croatian circumstances, well developed QA system and its strict implementation has much deeper and more significant implications for private educational institutions such as UCACE, compared to public ones. Therefore, we at UCACE will invest all our strength, knowledge, trust and experience in order to build and implement holistic, transparent and documented QA system, one that will make our vision of becoming first choice in professional higher education realized. Such orientation is therefore inwrought in our strategy, policy documents, books of regulations, operational instructions and KPI's.

3.1.1 Values

Apart of overall values stipulated within strategic goals and policy, there are six specific values stated in the Strategy, describing determination towards quality of education that we provide and realization of our Vision. They are:

1. **High value for money** – we at UCACE strongly believe that extremely high value should be given to our students in exchange for tuition fee they are paying. This is even more so today with "Free study to all" initiative, than it was during the time Strategy was developed. Stated is achieved through; curriculum that closely matches industry requirements, best training materials and teachers, industrial certification included within formal program and support in respect to cooperation with employers and subsequent employment through Career centre and Economic Committee.
2. **High level of professionalism and specialization** – although opportunism is immanent to present development phase of Croatian higher educational system, we are fully aware that trying to simultaneously become expert in many fields ends up being, at best, average in all of them. We are not interested in being just average, so all our efforts will be still focused on development of excellence in the field of applied computer engineering, the same field in which we are active and successful for more than 12 years. Furthermore, for the aforesaid reason UCACE will not develop nor offer accredited short lifelong learning programs until Croatian Qualification Framework endorsing such programs on higher educational level is finished. Present accredited adult education programs on level 4 of Cro QF and EQF will be still offered by Algebra POU, established market leader and the member of the same educational group as UCACE.
3. **Value of international certification build in our program** – Higher education will never be replaced by system of industrial certification for many reasons. Still, in the field of ICT value of international industrial certification is extremely important in Croatia (accordingly to survey UCACE conducted with CEA-ICT and CCE in 2010, 30% - 50% of employers consider certificates as an important asset in selection process) and globally (according to Certcities.com wages of certified engineers are 13-15% higher compared to their non-certified colleagues working on the same jobs). Industrial certificates are acquired through the process of independent external assessment organized and controlled on the global level by technology providers. Therefore it serves not only to students and their prospective employers but also to the UCACE and the public as an independent measure of educational achievements of our students.
4. **Strong and constant determination towards quality** – From its very beginning, while still in preparation of training program, UCACE's founder signed Contract with FER - most prominent

higher educational institution in the field of computing in Croatia and wider region, in order to increase quality of curriculum being developed. Accordingly to the stated Contract, FER and its experts will continue to conduct program assessments on annual basis, in order to help UCACE maintain high quality of its educational work. Positive review of 2010' FER assessment[10] and initiation of Pilot project in quality assessment and enhancement in professional higher education institutions in Croatia, both evidence that determination towards quality is not just wishful thinking for UCACE.

5. **Responsibility towards employers' and students' trust** – It makes tremendous difference to students in higher education, whether they are studying with the best in generation or with those not being able to pass state high school graduation examination or institution's entrance examination (if any). Quality of enrolled students determines consequently level of education that higher educational institution can conduct and hence results of the whole educational process. Furthermore, if an institution is for any reason willing to enroll students incapable of successful completion of the program, it can be certain that not only these deceived students will be unhappy for time and effort lost (and in worse case money paid for tuition fee), but they will also serve as bad ambassadors to employers and the public. Damage made to institution's reputation and public trust, and also damage made to all other students, even excellent ones, is long lasting and almost unrecoverable. For all the aforesaid reasons, we at UCACE highly respect given trust and we never put short term incomes or benefits ahead of responsibility, quality and trust.
6. **Long-term and systematic development of internal strengths and capabilities** – Investment in any higher educational institution is rarely motivated by speculative reasons. Instead, in its core there should be intrinsic motivation and willingness to promote wellbeing of wider social community. Since we at UCACE start from the same paradigm, it is our strong believe that by development of our internal resources and capabilities we can, given time, build higher educational institution that will be internationally comparable and will serve economy as a source of competitive advantage on EU and global markets.

3.1.2 Goals of quality in respect to training programs

UCACE's goals concerning quality of its training programs are stated clearly in its Strategy and are transposed in detailed operating procedures within number of other relevant documents (i.e. Guidelines for courses setup and conduction of training for teachers). They are distributed within 3 out of 6 main strategic aims listed in chapter 1.10. and are as follows:

1. Assure that the published official framework plan for each course is strictly followed within detailed plan of training execution, prepared by each teacher. This goal is especially important for courses which were prepared by expert teams and are now lectured by teachers who have not been involved in the course development. Furthermore, if when disseminated to the level of training execution plan, some courses have any overlapping elements, a team of experts including teachers of both overlapping courses will resolve each such issue.
2. For each course define measurable learning outcomes on the course level and assessment mechanism based on stated outcomes. Publish both; learning outcomes and assessment mechanisms, criterions and questions.
3. For each course prepare top quality training materials including but not limited to; Course handbook, lecture presentations, exercise questions, examples, scenarios for laboratory work, … All these should be either printed and given to each student or made available within on-line document repository. Each course must have printed official handbook written in Croatian language.
4. Maintain and develop implemented e-learning system and introduce support for distant students in the form of on-line web conferences, supporting at least lectures.
5. Implement eight basic competences for lifelong learning stated by DG Training and Culture in the training program and, if possible, in each course. To do that foster; oral and written presentation

[10] http://www.racunarstvo.hr/Uploads/dokumenti/ocitovanje.pdf

of one's work in front of colleagues, discussions and elaboration of ideas and attitudes, use of foreign literature, preparation of at least some documentation in English by each student within each course,…

6. Implement and conduct mentor support and mentor teaching for all students. Upgrade present system of early formative testing and proactive mentor approach with mandatory extra lectures for underperforming students to more active support also for best performers, who are now left to seek mentor help if they want one.
7. Increase the number of students successfully passing from first to second study year to at least 85% and strive to reach total of at least 70% of enrolled students graduating in 3 years.
8. Introduce formal awards and honorable mentions for best performing students. Upgrade present practice of partial scholarships for best performers with formal written recommendations and honorable mentions in order to further promote culture of quality and excellence.
9. Introduce formal methodical and andragogic training for lecturers and assistants.
10. Foster exchange of teachers on international level.
11. Upgrade existing undergraduate (180 ECTS and 3 years) program to graduate one (additional 120 ECTS and 2 years).

Stated goals have been identified by the Committee for Strategy upon discussion with members of the Economic Committee - representing most significant employers in ICT in Croatia, and analysis of students' reactions and recommendations given within student surveys in 2008 and 2009. Monitoring of the training program quality is a constant process described in detail in Book of regulations on QA System and checked against desirable KPI thresholds. Program enhancement is done constantly upon received suggestions and recommendations (from students and Economic Committee members), and in cooperation with broader representative sample of employers, at least once each 2 years as stated in the Strategy.

3.1.3 Positioning in respect to stakeholders

National institutional stakeholders

UCACE was founded as a reaction to shortage of highly skilled ICT experts on Croatian labor market that lasted, at that time, for almost a decade. To be able to detect and quantify proportions of the stated shortage, we were in constant communication and partnership with CES and other private employment agencies (i.e. moj-posao.net). Through the partnership with CES and APIS IT – one of the biggest software companies in Croatia, we organized pilot career training program for group of Java developers in 2007 in order to measure interest and employability of unemployed students. Achieved results stimulated us to proceed towards program completion and initial accreditation, while on the other hand CES continued to partner with us on even higher level, considering us to be IT training provider of choice. Two members of our managing board and our CTO are represented in CES's three mayor human resources development projects financed by EU Commission under IPA: "Local partnership for employment - Phase 3" and "CES Services to clients: Improving Lifelong Career Guidance and ICT Support". Our experts are constantly exchanging information with CES's team in respect to labor market attributes while providing them with invaluable information in respect to technology trends and outlooks. UCACE and Algebra group are in most Croatian towns members of organization Committee for CES's "Career days" event, promoting careers to high school graduates, unemployed and other interested parties. For the past years our staff did not only provide information to participants on our stand, but had been also involved as a members and speakers in different panels when ICT employment and trends were considered.

To get even better insight to ICT employers' requirements and to support them, we were and still are active in CEA-ICT which is the only association of employers with the social partner status. There, our Managing board president is vice-president of the Association. In partnership with CEA ICT and CCE, UCACE organized and conducted two large scale annual surveys of skills and competences requirements within employers in ICT. As a result of these activities we managed to initiate formation of Committee on Croatian ICT Strategy that was announced by Minister of economy recently.

In order to support development of our program and to constantly observe and audit its quality, we closely cooperate with FER and benefit from the exchange of knowledge and expertise possessed by the

most significant research oriented Faculty within University of Zagreb. In order to be, as much as possible, equal partner, we initiated and prepared a curriculum development project where CEA-ICT, FER, IEEE Croatia and three VET schools are partners. Stated project will support development of modern VET curriculum for *computing technician* that will be fully in line with market requirements. UCACE's and FER's experts will work together with experienced VET teachers in order to develop new curriculum, training materials for pupils (including: handbooks, workbooks, guidelines for teachers, virtual training environments, assessment database, etc.). Development of the new program will be financed by IPA and was proposed as a part of development of National Qualification Framework – CRO QF. As a result of the project we expect increased number of student who will start their VET education in that particular program and hence increased number of future students in computing and ICT higher educational programs. Overall goal is to, in the long run, reduce ICT expert shortage on Croatian labor market.

UCACE is an active member and initiator of activities conducted by Agency for VET and Adult Education (ASOOO) in order to modernize VET curriculums and qualifications and consequently build CRO QF. In that respect our Dean was, at the end of 2009 appointed by the Minister of science, education and sports to become a president of Sector Council for electrotechnics and computing. UCACE was till then host of number of sector council meetings and our experts prepared questionnaires and surveys for employers in order to prepare new VET curriculums in respect to market requirements. In Jun 2010 our Dean become also member of the Managing board of the ASOOO where he will try to help Ministry build such VET policy that will respect importance of technical sciences and ICT for national development.

Algebra and UCACE are particularly interested in wellbeing of persons with disability where we cooperate with number of institutions and NGO's including: URIHO – biggest institution for rehabilitation and work therapy for persons with disability, Fund for education and rehabilitation of persons with disability and SOIH – Croatian Union of Associations of Persons with Disability – National umbrella organization for persons with disability. In that field we initiated and conducted more than 10 different educational and development projects in the past 4 years, including translation of ICT literature to Braille and its production in printed and electronic form. UCACE's whole facility is fully adopted for students with disability and in 2010 we even outmatched our Strategy goal and raised two full 3 year scholarships for persons with disabilities paid by Privredna Banka Zagreb – Intesa Sanpaolo Banking Group and APIS IT. In 2010/2011 academic year there will be 3 students with physical disability enrolled on UCACE out of some 180 students. UCACE will continue to further actively support population of persons with disability in order to improve their almost catastrophic educational structure.

Other national institutional stakeholders are represented in Economic Committee populated with total of 12 representatives from:

- ICT companies
- Technology vendors (internationals but represented with local offices)
- University of Zagreb
- CEA ICT
- National Competitiveness council

Council meetings are organized 2 times each year and most important strategic and program development issues are discussed, together with the wider impact of UCACE's activity on the society. Decisions such as initiation of new degree program are first discussed and passed within Economic Committee before it can be passed to Management board and Professional Council. Economic Committee can also work in open public panels when discussing topics that may be of interest to wider community. State secretary for Industry was participating in Committee's open panel in April 2010 when employment in ICT was discussed.[11]

International institutional stakeholders

Being in existence for just 2 years and without any international reputation is not favorable grounds for extensive and fruitful international cooperation, we at UCACE would like to develop. Still, implementation of internationally recognized industrial certification in our formal program necessitated cooperation with international training providers and technical vendors. First such agreement and accession to Academic

[11] http://www.racunarstvo.hr/vijest.aspx?id=99743

program UCACE signed with Microsoft in 2008 (Microsoft Developer Network Academic Alliance (MSDN AA), followed shortly with accession to IBM Academic initiative, CISCO Networking Academy program, SUN Academic initiative program and in the spring of 2009 ORACLE Academic initiative. Through stated cooperation we receive most recent information regarding technology development and our experts are able to communicate and exchange experience with international industry specialists.

At the beginning of 2009 UCACE had first contacts with Griffith College, Dublin Ireland trying to reach mutual recognition of training programs in order for our students to be able to finish last year of their study in Ireland and get both diplomas, and to be able to continue graduate study there. Teacher exchange and mutual development and research projects were also discussed.
Following this first contact Griffith's representatives visited our facility in late 2009 and conversations were held with Managing board members and the Dean and training programs were exchanged. Further work was then retarded by our side in order for UCACE to implement learning outcomes to each of our courses as requested by Griffith and to successfully conduct quality assessment project with NVAO. In July 2010 conversations continued and detailed curriculum was prepared for Griffith's academics in order for the bilateral contract to be reached. When stated cooperation will be in place, our students will have opportunity not only to use already available ERASMUS program that we promoted to them, but also benefits of studying in Ireland as stipulated in bilateral agreement. Furthermore, UCACE's students will have the opportunity to attend lectures held by Irish experts via existing video conferencing system. We at UCACE are fully capable and in support of student exchange and will further promote possibilities for our students to attend part of their study abroad within ERASMUS and other programs. UCACE's strategic task 32, defines that at least 2% of students enrolled in each generation should spent minimum of one month on foreign higher educational institution during his / hers 3 years undergraduate program. Furthermore, according to the same strategic goal, development of the part of study program in English is also foreseen in order to attract more foreign students. Still, that task is not scheduled to be reached in the next 4 year period due to other more priority development tasks and also good understanding of Croatian language in the region (Bosnia and Herzegovina, Serbia, Crna Gora) where UCACE can establish its brand sooner and more easily.

Another bilateral agreements covering similar types of cooperation will follow shortly, once we have produced detailed program and curriculum description based on learning outcomes, that is translated to English and published on our international web page[12].

During 2009 and 2010 UCACE tried to assemble international institutional partners in order to apply for research and development project in development of computerized assessment infrastructure for drivers' tests; Automated Testing in Driving Licensing (ATDL). Till this end, we prepared coarse project application and got support for the project from CIECA - The international commission for driver testing authorities[13], xxx and yyy. Project will be proposed for financing under EU Eureka fund.

Most important international project that will, in a way shape future of UCACE started in March 2010, financed by the Flemish Government within the co-operation programme between Flanders and Central and Eastern Europe. Pilot project in quality assessment and enhancement in professional higher education institutions in Croatia was initiated and prepared for financing in early 2009 by UCACE's experts. Project will possibly have wider implications on quality, not only on involved partner institutions (one of which is also UCACE) but also on other professional higher educational institutions willing to use its deliverables in order to learn how to improve their internal QA systems.

Internal stakeholders

Students and employees are most important internal UCACE's stakeholders. In order to support their influence on strategic and operative decisions taken by UCACE, both groups were represented as early as in preparation of development strategy. Two student and six teachers were among 14 members of Committee for the Strategy development. Students are also represented in other relevant decision making bodies such as; Professional Council (2 out of 7 members), Committee for Quality (2 out of 5 members), Committee for Ethical Issues (1 out of 3 members) and Committee for penal measures (1 out

[12] http//www.racunarstvo.com
[13] http//www.cieca.be

of 3 members). Students and staff members are in the position to influence and upgrade operation and even policy of the UCACE if they think necessary. They are able to do so also individually by sending signed or unsigned complaint of any kind. Each such claim will be analyzed by Committee for Quality and if necessary escalated to higher level (Dean or Managing board).

Students within UCACE are organized within Student section and are in the process of registration of their own NGO "KASPER". Work of the section is supported by UCACE when such support is requested by the students (i.e. sport clothes were purchased for two teams representing UCACE on official University sports games, UCACE financed freshmen's party in 2009, …).

UCACE's Vision inherently put great emphasize on internal and external stakeholders. They both have to be fully satisfied with the way institution is performing in order for it to become first choice for professional higher education in Croatia. In that respect students' and employers' propositions and recommendations should be well balanced while at the same time social and national context should not be put aside. Although maybe not obvious at the first glance, institution's international dimension and therefore influence of international stakeholders is also important because international cooperation, especially in the ICT field, cannot be stressed enough. It will be even more so once Croatian higher educational market is populated with eminent and well established foreign institutions experienced in student and teachers exchange and involvement in significant international projects. We at UCACE know that our students should be ready for future ICT labor market dominated with trends such as; ofshoring, cloud computing and externalization of services, where international experience may pay curtail role for employment and personal competitiveness.

3.1.4 Continuous enhancement of aimed quality

We at UCACE do not consider quality to be just a measure of performance. Especially not just a measure of effectiveness and / or student satisfaction with conducted education. Instead, we see quality as a source of our competitive advantage and at the end of the day, our only destination for survival and future development. In that respect enhancement of the quality is inwrought in our policies but also in our organization and a way we think and perform. In UCACE's short existence it was our determination for success and better competitiveness that made us:

- Move to new facility in order to build better academic environment
- Assemble Economic Committee with significant authority over UCACE's development in order to establish direct and sustainable contacts with external stakeholders
- Help Ministry to develop CRO QF in order to promote more pupils elect study in the field of ICT and computing, resulting also in the long run, in better capabilities of high school graduates enrolling to UCACE
- Prepare handbook for each course (most of the higher educational institutions in Croatia does not have such infrastructure after decades or existence)
- Start the Quality assessment project with NVAO

All of the aforesaid and many other activities were done as a part of UCACE's determination to enhance its quality and were not dictated by any stakeholder nor compulsory or prescribed in legal framework.

Further continuous enhancement of aimed quality is already included in our strategy and policy documents, backed up with development goals, action plans and desired KPI thresholds.

3.2. Internal quality assurance system

Internal quality assurance system that UCACE built and is still developing is clear, documented and transparent, covering comprehensively all aspects of our work, not only educational activities. It respects interests of employees, students, employers, national economy and EU and national strategic development guidelines. UCACE's internal QA System involves students, employees, employers and other relevant stakeholders awarding them with clear functions and influence on all processes that occur in UCACE. Operating procedures, authorities and responsibilities are determined within corresponding regulatory acts. In order to realize its vision of quality, UCACE set up a series of strategic tasks grouped within strategic aim 2. They are as follows:

1. Develop and implement documented internal QA System and successfully complete anon institutional reaccreditation planed by ASHE as well as program reaccreditation scheduled by FER. In that respect NVAO and ESG guidelines as well as Croatian acts and ASHE's recommendations will be closely obeyed. Furthermore, UCACE will use Algebra's experience and prepare internal documentation and operating procedures accordingly to ISO 9001 / 2008 standard in order to implement ISO certified quality system in the future. Certification and full accreditation of the quality system according to ISO norm will be organized only after first generation of UCACE's students finish their complete 3 year program in order for UCACE to fully develop and implement all operational procedures and corresponding documents, from enrollment to diploma project an promotion of graduated engineers.
2. Complete initiated Pilot project in quality assessment and enhancement in professional higher education institutions in Croatia and successfully pass institutional assessment accordingly to NVAO framework. In this respect NVAO's assessment framework, ESG and ASHE's reaccreditation guidelines were all used in order to fine tune institution's processes and prepare this self evaluation report. Although NVAO and ASHE both used ESG as the guiding element in their frameworks, difference in emphases (NVAO's towards QA System's results and ASHE's toward QA System's existence and infrastructure) was clearly determined and respected.
3. Form necessary internal organizational infrastructure and bodies necessary to fully implement QA System.
4. Constantly and fully maintain and pursue implemented QA measures and procedures.

In order for UCACE to be sure that its vision and quality culture is fully supported by all staff members and other involved internal stakeholders throughout the organization, they were involved in its very creation. Furthermore, vision, policy, operating procedures and strategy are published and constantly emphasized by UCACE's management, while individual responsibilities and job descriptions, in support of UCACE's vision, were prepared and communicated to each staff member, being also a part of their work contracts.

Apart of the preparation and publication of its vision and policy documents, UCACE used two other techniques in order to infect all of its internal stakeholders with the quality culture;

A) Honorable mentions and rewards for its best performing students and staff members are used to create row models and promote excellence.
B) Set of measurable and clear KPI's, covering most aspects of UCACE's work was introduced in order to control overall institution's performance and its progression towards set vision.

3.2.1 Organizational structure of quality assurance

In its Policy, UCACE stated that Internal QA System should in organizational context recognize and respect roles and responsibilities of internal organizational units (i.e. Committees, departments…) and each individual staff member for maintenance and development of overall quality. That will be achieved through monitoring and evaluation of realized results against published expectations (KPI's). Stated quality goals will be continuously monitored by Committee for Quality and other quality assurance organizational structures in order not only to observe and react but also to innovate and initiate system's revisions and upgrade.

From the organizational standpoint, Committee for Quality (CQ) is in charge of QA System as stipulated in Book of regulations on Quality Assurance. It is appointed by Professional Council and it consists of 5 members, presided by Dean's assistant for quality issues, and assembled by one student representative, one representative of Managing Board and two teachers out of which one is full time staff member and other is external expert. Accordingly to the article 14 of aforesaid document, CQ is in charge of:

- QA System of UCACE
- Strategic planning and development of guidelines and procedures for enhancement of Quality
- Recommendation of concrete projects, activities and innovations that may result with enhancement of quality to Professional Council, Dean and Management Board

CQ works in sessions as stipulated in Rules of conduct for CQ. Each academic year there should be at least four sessions out of which one at the end of each semester serving to prepare report on quality of conducted education and other activities during the semester. Stated report and CQ recommendations

are used as a basis for the special Professional Council's meeting concerning quality issues. Two such meetings will be organized each academic year. For each CQ session, minutes will be prepared and formally consigned to Dean and Professional Council. According to the Article 44 of Rules of conduct for CQ, Sessions minutes will be published in shortened version, excluding elements that may endanger UCACE's competitiveness and / or would compromise privacy of any person as regulated by Act on protection of personal information (Official Gazette 103/03 with amendments 118/06 and 41/08) and Croatian Constitution. Dean will decide on contents of published CQ Session minutes.

According to Book of regulations on Quality Assurance, CQ will be held responsible also for activities as follows:

- self evaluation (including preparation of self evaluation report together and in cooperation with other stakeholders and self evaluation reporting at the end of each semester for Professional Council's meeting. Other departments will provide information and data for self evaluations when requested by CQ),
- development and enhancement of Quality indicators (including some of the KPI's),
- involvement of students in Quality monitoring,
- monitoring successfulness of studying and detecting causes of ineffective, unsuccessful and too long studying,
- research and monitoring of teaching staff competences,
- initiation of andragogic and methodological training for teachers and assistants in coordination with department for teachers support,
- initiation of training for administrative and technical staff if one is required based on results of quality monitoring,
- gathering proofs of education enhancement,
- measurement and analysis of basic and professional competences reached as a result of study program,
- evaluation of teacher's reports and preparation of argumentative feedback,
- evaluation and preparation of argumentative feedback on received complaints, objections and recommendations,
- involvement of its representative in the work of each special Professional Council's meeting concerning quality issues.

Furthermore, QC and its members can, according to article 43 of Rules of conduct for CQ, respond and react to observed quality breaches even outside QC sessions. It is especially so in case of underperformance within teaching process where remedial actions and quality checks can and will be undertaken by President of QC, as per action plan schedule or provoked by received compliment or student survey results. Any such action will be documented using formal template.

Although Quality Assurance is formally handled by QC, responsibilities to promote and enhance quality are prescribed also in operating procedures of Economic Committee, Ethical Committee and Committee for penal measures. According to UCACE's Statutes, Professional Council, Managing Board and the Dean are also responsible to build and enhance quality. Responsibilities in that respect concerning each employee, department or sector are described in the Book on Systematization and Organization of work places and responsibilities.

After QC's recommendations or QC's Session minutes are received by the Dean, he will depending on the actions proposed;

- Resolve issue upon authority assigned to him by UCACE's Statutes (i.e. dismiss staff member, employ additional administrative staff member, consent to purchase of additional equipment, consent to change work schedule or organize more additional lectures, etc.)
- Assemble Professional Council and discuss proposed actions in order to reach decision (i.e. decision to reduce study groups, decision to discharge or hire new teacher, decision to initiate revision of subject or program, etc.)
- Inform Managing Board President and demand that the Board discusses proposed action or project. Dean will provide information during the Board meeting and if required, QC president can be called to participate during the meeting.

3.2.2 Policies, procedures and documents supporting Quality Assurance

Motivated by years of experience in use and development of ISO 9001 quality system implemented in Algebra, we started to document our work procedures using the same principle and similar templates. On the other hand during the course of time we have prepared and published external documents in form of Books of regulations covering all aspects of our work. As a relatively young institution, we managed to prepare each of them as we become able to fully define particular area or procedure. It can be therefore witnessed that our first book of regulations on Study (for 2008/2009) covered only part of activities that are covered with the current one (for 2010/2011). Also, Book of regulations on responsibilities and penal measures[14] was prepared only after first such incident was reported to Professional Council and had to be resolved using only Statutes and Book of regulations on Study. Ethical Codex[15] and other regulatory documents followed, respecting goal 10 of UCACE's Strategy. To this end UCACE have prepared and uses:

- **9 Books of regulations** including; Book of regulations on Systematization and organization, Study, Penal measures, Work, Election and progression of teachers, Protective measures on work, Final thesis, etc.
- **3 Rules of conduct** including; Rules of conduct for Quality Committee, Economic Committee and Professional Council. Rules of conduct for Ethical Committee and Committee for Penal Measures are already included in corresponding Books of regulations.
- **16 Documented work procedures** including; Guidelines for courses setup and conduction of training for teachers (Guidelines), procedure on examination held in front of commission, procedure on documentation handling and backup, preparation of educational materials, certification testing, enrollment of students, use of IT system in accordance to other internal procedures and legal acts, classification of formal documents, remedial actions for noncompliance in educational process, etc.)
- **20+ Formal templates**, some of which already technically included in its IT infrastructure
- **Integral Development Strategy** of UCACE for period 2009 – 2013 including general strategic aims on Quality (Quality Policy), Human resources development (HR Policy), Infrastructural development (Infrastructure Policy) and Cooperation (Cooperation Policy). Research activities are covered within HR and Cooperation Policy.
- **Integral action plan** supporting Strategy, including items on: HR development, Infrastructural development, Research, Cooperation and Quality.
- **Annual operating plans**; for teachers and staff training, research and project activities and quality control activities.

Development of policy documents started also relatively early. First short term and, if evaluated from present perspective, incomplete Development strategy was prepared in November 2008 by then President of Managing Board who used most of it as his operating program some half year later to win elections for ordinary Dean (institution was managed by temporary Dean for the first year of its operation). The short term Strategy was accepted by Managing Board in December 2008 and its results were discussed and accepted as per *Implementation report on short term development strategy for period November 2008 – September 2009*, during Managing Board meeting in November 2009 when new Strategy (2009 – 2013) was also accepted. Stated new strategy was prepared as integral document including three policies listed in preceding paragraph with detailed QA goals and tasks scattered through few strategic aims. Revision of any policy within the Strategy can be done in two possible ways:

1. Better definition of measures and activities that are in line with the existing strategy can be done through development of supporting documents such as (Books of regulations, Rules of Conduct, Operating plans, documented work procedures)
2. More significant policy changes are possible each year when implementation of strategy for the past period is evaluated by Managing Board. During that process, strategy revision will be started in order to update action plans, add or amend KPI's and possibly revise, add or change strategic aims and goals. Strategy revision will be done by Management Board in consultation with at least 50% of initial Committee for Strategy members who brought initial strategy. If two student representatives are not present in the UCACE any more, current student representative in QC and Professional Council will be consulted.

[14] http://www.racunarstvo.hr/studij.aspx?id=1309
[15] http://www.racunarstvo.hr/studij.aspx?id=1311

Evaluating aforesaid documents and their structure, can draw a conclusion that each staff member and elected member of any Committee or Council have available documents and procedures in order to be aware of its responsibilities. They are described for staff members in their personal workplace list of responsibilities (also amendment to work contract), documented work procedures and department's and sector's responsibilities and for elected members in aforesaid Books of regulations and Rules of conduct.

3.2.3 Resources

For new and unproven private higher educational institution operating within already described Croatian higher educational area, resources required to reach highly set quality goals are even more important than documented quality system and well elaborated strategic and development plans in its early days. UCACE for that reason invested significant energy, resources and financial means during its first yare of operation (considered by its Managing Board as very early stage of development) in order to build them. During that period, UCACE managed to:

- Equip and move to high quality new facility, allowing us to have complete educational process organized in one place. By doing so UCACE's students and staff got much better working conditions compared to academic year 2008/2009 when lectures were organized on FER, Exercises and Labs in Algebra's facility (Maksimirska 58a) while most of the teachers, Dean and Managing Board was situated on third location in Savska 66, Zagreb.
- Purchase new equipment in order to modernize its labs in order to be able to organize high quality training for two parallel generations of students and to support work of new employees. With more than 100 PC's for students and more than 1 PC per each staff member in Ilica facility, UCACE reached acceptable standard supporting future enhancement of overall quality.
- Reach agreements with external training partners (IBM, Microsoft, Cisco, Sun, Oracle, IPMA) in order to acquire software licenses for its equipment and for students and to get training resources that can be partially used for labs and exercises in order to prepare students to reach set learning outcomes and also industrial certification.
- Purchase, implement and further develop IT System (Infoeduka) supporting its complete educational process and serving already in that early phase as the infrastructure for future robust Quality Assurance system. In its original form Infoeduka had all options and tools contained within ISVU System that was provided free of charge to all accredited institutions, and more. Still, we decided that it is worth investing financial and other resources in that solution and develop it further in order to once have competitive advantage compared to other institutions using ISVU and also reduced administration and number of required administrative staff.
- Prepare application for Pilot project with NVAO in order to support development of its internal QA System.
- Assemble Economic Committee in order to get constant and sustainable contacts with most significant employers, necessary to support UCACE's further program development but also its students in terms of final projects and work placement.
- Support scientific and professional work of its prospective teachers and their advent on national and international scientific conferences in order for them to reach prerequisites to be elected teachers.
- Invest in development and production of 12 handbooks for courses toughed on three first semesters.

If present situation at UCACE is analyzed from the perspective of resources required to reach set quality, already listed should be amended with:

- Operational Career Center supporting study, work placement and employment of UCACE's students and capable of supporting students with disability through involvement of external experts.
- Developped xx handbooks and training materials for 5 out of 6 semesters.
- 30 employees, 7 full time employed teachers.
- Infoeduka system fully integrated with internal financial system of Algebra group and capable of data interchange with Algebra's ERP, LMS and testing infrastructure. In respect to QA it includes:
    - System of student on-line surveys with reporting subsystem
    - System for constant student assessment monitoring able to distinguish each point (not ECTS) scored by the student per assessment criterion and learning outcome

  - System for monitoring and reporting on realized education according to detailed lecture plan, able to distinguish each lecture and topic and associate to them students who were attending
  - Different reports on students and teacher's performance, enabling comparation and back office analysis
  - Subsystem supporting analysis of teachers and assistants work load
- Variety of teaching and students resources described later in chapter 3.3.3

Taking into account that we expect total of some 180 to 190 students to be enrolled at UCACE in 2010/2011, we think that available resources can support desired level of quality and serve as a foundation to further development.

3.2.4 Targets

UCACE's targets concerning quality are elaborated in its Strategy under Strategic aims 1 and 2 as already mentioned in chapters 3.1.2 (targets concerning quality of education) and 3.2. (targets concerning QA System). They are further developed within:

A) Action plan containing total of 60 detailed tasks out of which 34 are oriented towards quality assurance and enhancement. Each task is also described within the strategy, some tasks are already achieved and some repetitive tasks are implemented through Books of regulations or documented work procedures (i.e. Annual reporting on quality of education and overall UCACE's performance measured against KPI thresholds). Tasks concerning quality are designated with specific designator (Q) and person, department or other organizational unit responsible for its realization is clearly defined with expected due date.
B) List of UCACE's KPI's containing total of 30 measurable KPI's out of which 18 are oriented towards constant measurement of institution's quality. All KPI's are listed in chapter 3.4.1

Persons responsible to measure and monitor KPI's, as well as the source of relevant information are designated within KPI list.

3.2.5 SWAT

Table 4 shows strengths and weaknesses in terms of policies and funding but also possible threats and opportunities.

Internal	Strengths	Weaknesses
	- Experience of UCACE's founder and management structure to prepare strategic development documents and policies respecting real requirements of educational market, - Strong position of Economic Committee within UCACE's managing structure as co-initiator of strategic development, - Quality culture inwrought in value system of UCACE's staff who was mostly taken over from Algebra, - Financial strength of Founder and willingness to support development of UCACE.	- Lack of own experience and understanding of overall educational cycle in higher education by UCACE's staff lingering development of some policy documents, - Current income insufficient to support development unless co financed by founder. - Lack of institutions' brand and market position that will attract more students and increase income, required to accelerate further development, - Absence of additional graduate program what necessitates future investment of resources in order for UCACE to become fully attractive to prospective students.
External	Opportunities	Threats
	- Knowledge and already prepared applications for EU funded projects that my help UCACE in order to build its infrastructure and start wider international cooperation, - Established relationships with the Industry that may yield increase in number of students financed by their employers once economy downturn finishes, - Increase in number of enrolled students once graduate study is introduced.	- Financing of higher education in Croatia that my fully undermine position of private higher educational institutions if government persists in newly introduced system, - Too slow change of public perception of private higher education, - Arrival of experienced, well established international institutions before UCACE manages to build trust and hence its position.

Table 4. – SWAT analysis in terms of policy and funding

Two general types of weaknesses can be perceived; lack of own experience and knowledge regarding full higher education cycle and insufficient UCACE's income. First one can be fully prevailed in the same time

next year, once UCACE launches its first graduates to the labor market. In the meantime support and consultations received from FER as well as extensive analysis of literature can certainly make some remedy.

Lack of income is significant threat to future UCACE's development. It can fully be prevailed with enrolment of initially planned 130 - 140 students this year, 150 - 160 in generation 2011/2012 and 170 - 180 in 2012/2013. Due to severe economic downturn in Croatia and new Government's financing initiative for higher education, UCACE will not reach its plan for this year and future plans are also jeopardized. In the given circumstances more funding for development will be seeked within IPA and other internationally financed projects and through development of better cooperation with the industry. Some remedy to the problem will be provided through Algebra's support in respect to courseware development.

3.3. Quality of education

Quality of education was almost a mantra that once in the past became code of operation governing all decisions of UCACE's founder, making it finally top provider of ICT education in Croatia. Same principle was respected by UCACE's management from the institution's very beginning. It was used when market analysis was conducted in order to prepare training program, it was strongly incorporated in UCACE's first short term development strategy, in approach governing development and availability of learning resources and also in selection of teachers and other experts involved in program production and teaching.

First problems in respect to quality of education were encountered while assessment and other educational criterions were discussed with teachers that would teach six courses during first semester of academic 2008/2009. Lack of experience in higher education and absence of written recommendations and rules of conduct for teachers required too extensive involvement of UCACE's managing structures in order to organize educational process on expected quality and organizational level. To put it simply, teachers were more experienced than the institution and they tried to maintain approach and procedures they used to use in other higher educational institutions they already worked for. That reverted focus of UCACE's management from development of infrastructure to policy development, preparation of guidelines for teachers and upgrade of Infoeduka to support UCACE's educational approach funded on full implementation of Bologna recommendations and FER's experiences. During the semester first guidelines for teachers were produced, number of meetings were held, templates for course definition in respect of student requirements were prepared and Infoeduka started to support UCACE's assessment methodology that, at the time, respected different assessment criterions but still did not covered learning outcomes.

During that period we at UCACE gained significant experience which helped us prepare more elaborated policy and regulatory documents depicting our vision, that followed. Also, UCACE's management learned that laissez-faire approach cannot be used for almost any issue and that, in turn, over regulated is better than under regulated. In order to reduce teaching staff's burden to go through to many documented work procedures, most of the were incorporated in new functions added to the Infoeduka.

3.3.1 Program design and learning outcomes

UCACE's program was developed as a result of two extensive market and industry researches, backed up with involvement of external and internal industry and educational experts and FER's program team, as already mentioned in chapter 1.2. Approach used in program preparation significantly differed from accustomed approaches that were used to prepare other professional higher educational ICT programs in Croatia. In contrast to professional higher educational programs in ICT that already existed, we wanted to really listen to industry and decided to respect their recommendations and prepare program that is not:

1. Copy of any existing professional higher educational program
2. "Light version" of scientific higher educational program (toughed at Universities) pretending to be professional one

Rationale behind such endeavor was our interest not to spend too much time to our undergraduate (3 year / 180 ECTS) students teaching them basics that are not applicable in the industry, reducing that way

time necessary for them to be become fully operational with complex computing and ICT skills and hence employable as soon as they graduate, without necessity for them to continue on graduate program if they do not want to.

Stated determination was inspired also by deeper insight into ICT labor market got from:

- CEA-ICT in form of *Analysis of the Croatian ICT Industry, 1999 – 2004*, prepared by IDC Adriatics in 2006 and interviews held with CIO's,
- CCE's report showing economic parameters of the industry (Income, firm sizes, number of employees,…),
- publicly available admission quotas and number of graduates on Croatian Universities and Colleges published annually by Crostat.

All aforesaid inputs leaded our program team to conclusion as follows; although there had been lack of highly educated ICT experts on Croatian labor market for at least 7 years, it was even more significant in the area of more applicable (industrial certificates would be an asset) experts with Bachelor's degree in ICT.
That was so because market required more such experts compared to research oriented university graduates with broader generic knowledge and less applicable skills. On the other hand total admission quotas and hence number of graduates in ICT was for years some 8:1 to 5:1 in favor of University graduates. Stated disruption, as seen by CIO's and CEO's, resulted in two side effects undermining competitiveness of Croatian ICT:

- structure of employed in ICT is such that some 50% of totally employed are only high school graduates with limited skills and knowledge.
- due to lack of expertise and knowledge, university graduates (300 ECTS) finished working as programmers and system administrators what significantly raised wages in the industry making it uncompetitive even to some of our EU rivals (i.e. Slovakia, Check republic, Poland) and not to mention; Romania, Bulgaria or former Yugoslav countries.

When all stated inputs were taken into account, program design was done in respect to skills required by the market and the industrial certification pathways all transposed to learning outcomes on the program level, separately for System[16] and Program[17] Engineers. As already stated, ASIIN recommendations were fully respected, EUCIP structure was closely analyzed and EUCIP Core was incorporated within the program while international developments in the field were also seriously considered (Norwegian School of Information Technology, Oslo; Institute of Technology Tallaght, Dublin; Griffith College, Dublin;…). Finally FER's expert team made revision of the program and issued positive recommendation that was used as supporting document during the process of program initial accreditation made by National Council for higher education.

Although stated may look like a simple and non complex task, this approach took us much more time and effort compared to commonly used Croatian principle of "adopting" university programs or copying already existent Professional ones. Therefore, UCACE ended up with 50 courses out of which some 70% did not existed in Croatian higher educational area and other 30% had some similarity with courses already lectured in other local institutions. Most of this, similar courses are basic ones like; Math, English language, Basics of Economy and Management… During the curriculum development special care was taken to interrelation between courses in respect to natural learning process but also to certification exams and certification track structure. For that reason certain courses had to start relatively early (i.e. introduction to networking and introduction to programming both start in the first semester) in order for their successors to have "time" to continue (i.e. there are total of 4 networking courses required to build student's skills and knowledge required to reach certain industrial certificate.)

UCACE's study program was initially prepared and fully described accordingly to then valid Sub law on standards and criterions for higher educational institutions foundation (Official Gazette 09/2005) and Sub low on standards and criterions for quality and efficiency assessment of higher educational institutions and programs (Official Gazette; 09/2005) and was published on our web page and in printed student

[16] http://www.racunarstvo.hr/studij.aspx?id=1256&idc=99450
[17] http://www.racunarstvo.hr/studij.aspx?id=1257&idc=99457

brochures[18]. As stated in chapter 1.1. UCACE's program was formally accredited by MOSES on 16th of Jun 2008 and is delivered since to full-time and part-time (working) students using the same methods and approaches as well as the same number of lectures but only in different daily / weekly schedule.

Aforesaid legal acts were derogated in 2009 by the ASHE's recommendations for initial program accreditation stipulated in Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09). In order for UCACE to comply with the new act, each course description was recently amended by its teacher or course expert team using:

- Initially prepared Learning outcomes and educational goals on the program level,
- Detailed template for course definition including (course name, ECTS, number of lectures and exercises, educational goal, course contents, (intended) minimal and desirable learning outcomes, detailed training plan, assessment criterions),
- Book of recommendations for preparation of training programs and courses upon learning outcomes and educational goals principle,
- Guidelines for courses setup and conduction of training for teachers

UCACE's Professional Council decided in Jun 2010 that the course definition template and the Guidelines for course setup will be further amended in order to also introduce desirable learning outcomes in addition to mandatory (intended) minimum LO, required by current Act on Quality Assurance. In order to help teachers prepare them, detailed written guidelines with illustrative examples were prepared and distributed to teachers. They were also given possibility to receive in vivo consultations and phone / mail support. Prepared LO for each course were afterwards checked against guidelines by department for teachers support and Dean's assistant for education.

During the preparation of guidelines for teachers and indicative examples on LO, and also when program learning outcomes were structured, UCACE's experts were well aware that LO are much more than the simple identification of learning achievements. Therefore, their direct relationship to levels and level indicators was taken into account in order to stay in line with international and national reference points.

3.3.2 Student Assessment

Minimal (intended) learning outcomes on program, module and course level are sole written and verifiable pledges educational institution can give to its prospective students and their employees in respect to students' achievements at the successful end of study process. In contrast to them, curriculum, course contents and even educational goals are just wishful thinking of professors in respect to students' skills and knowledge at the end of the teaching process.

We at UCACE believe that assessment guidelines, policies and models greatly determine knowledge, skills and hence employability of our students. In that respect we made them transparent and public, while our assessment models and criterions are simple and organized strictly in accordance with learning outcomes, representing publicly given pledges.

Assessment model used by UCACE is criterion-referenced with implemented continuous point accumulation, supported fully by Infoeduka system. During the first two years of its work, prior to introduction of intended and desirable learning outcomes on the Course level, UCACE also used the same model. In principle, each teacher had to define and publish guidelines on course attendance and assessment criterions for students using formal template. In this document questions such as; required percentage of attendance and procedures in case of illness and absence (if differs from general rule set in article 34 of Book of regulations on study), No. of points that can be scored on any assessment element, transposition of scored points (where 100 is maximum) to grades, assessments interrelations if any, other student requirements, special benefits for students with disability,… were answered. Teachers discussed this document and stipulated rules with the students during the first lecture while students had a chance to give their reflections on assessment and other criterions. Also, the same opportunity was given to students within course satisfaction surveys.

In order for student assessment to be representative, at least 75% of possible points during continuous assessment (equals 75 points) must be awarded for assessment elements organized in controlled

[18] http://www.racunarstvo.hr/Uploads/dokumenti/Katalog%20Visoke%20škole.pdf

environment, (mid-term exams, oral exams, standalone lab exercises,…) and other 25% can be awarded for; essays, homework, seminars, attendance and other activities. In respect to oral examination there are two available approaches;

1. Maximal number of points that a student can score on oral examination is already prescribed and is part of total possible points (100)
2. No maximum number of points is prescribed for oral examination. If conducted, oral examination can influence the grade student would get if other assessment elements are used only. Putted simply, oral examination is a corrective element to final grade scored at the end of the course.

Since UCACE did not have learning outcomes per course introduced during the first two years of its work, teachers used oral examination in order to check whether students are familiar with the complete course content and not only its parts. In that respect, all teachers preferred approach 2 to oral examination. There were also few courses without oral examination.

Starting from academic year 2010/2011 intended and desirable LOs are introduced to all courses and they are published together with the list of questions and typical examination exercises which are each coded per LO. For each summative examination organized in controlled environment (i.e. mid-term exam) number of required points per LO is published in order for the student to pass the exam. Each mid-term exam question is designated with the LO code in order for students to have clear picture what they have to do in order to pass. System works in a way that student cannot pass mid-term exam covering i.e. two LOs unless he or she scores at least 50% of points on questions covering each of them. If 75% are scored on questions for LO1 and only 45% on questions for LO2, student did not pass the exam. Students have opportunity to retake only part of the mid-term exam (i.e. representing only one LO) the same day when mid-term 3 is taken (defined per Course within Guidelines for students).
Only Intended LOs are coded since desirable LOs are actually only advanced versions of intended ones in the same area and the field. Results scored per each LO will be shown to the student within his/hers profile in Infoeduka system and possibly on diploma supplement. Example of filled in assessment matrix (for specific student at the course completion) combining Assessment criterions (AC) and Learning outcomes (LO) for one course, as represented in Infoeduka, is shown in the table below. Numbers represent points scored where 100 is a maximum.

Assesment criterions for Course: Introduction to computer networks

LO/AC	Attendance	Homework	Mid-term 1	Mid-term 2	Mid-term 3	Oral exam	Achieved	Maximum	%
LO1		1	8			1	10	14	71,43%
LO2			7			2	9	14	64,29%
LO3		1		6		2	9	13	69,23%
LO4		1		5		1	7	13	53,85%
LO5				3		4	7	14	50,00%
LO6		0,6			9	1	10,6	14	75,71%
LO7					8	2	10	14	71,43%
Achieved	3,23	3,6	15	14	17	13	**65,83**		**Grade**
Maximum	4	4	25	25	25	17	**100**		**C**
%	80,75%	90,00%	60,00%	56,00%	68,00%	76,47%	**65,83%**		

Table 5. – Assessment matrix

Semester at UCACE is organized in 3 blocks each lasting for 5 weeks with at least 2 weeks off in between them for mid-term exams, as already described in chapter 1.4. During the semester, formative and summative assessments are combined. Results of formative assessments are not recorded as a part of continuous assessment, but are used for students and teachers as learning aids. Firs formative assessment should be organized during the first teaching block preferably in the third week, as stipulated in chapter 14 of Guidelines for teachers. Result of that examination should be used to group underperforming students and oblige them to participate in additional consultations or classes (if required, decision is on teacher in consultation with Dean's assistant for education) organized in prevalence of 1-2 school hours weekly. If their performance is improved on mid-term exam they can be exempt the obligation to attend extra classes. Further formative examination can be used per teacher's decision. There are total of 3 mid-term exams in each semester and for most courses final oral examination (not mandatory). Teachers are recommended, as per chapter 10 of Guidelines for teachers, to organize them in a way that each mid-term exam should cover only what was lectured in preceding 5

weeks, while oral examination should be used to cover complete course and all LO. If teacher elects and announces in Guidelines for students that there will be an oral examination for all students, they can obtain final grade:

1. Even without oral examination, if approach 1 form the top of the previous page is used for course assessment, if number of accumulated points totally and per each LO is sufficient for positive grade.
2. Only after such exam, if approach 2 form the top of the previous page is used for course assessment, regardless of points accumulated for other types of examinations.

Students are assessed by the teacher in charge of the course. According to the article 31 of the Book of regulations on study, student not satisfied with the result of assessment process can make official complaint. In such case new exam will be organized, this time by the examination committee appointed by the Dean, while at the same time complaint will be also reviewed by QC as per Book of regulation on Quality Assurance. If even after 3 attempts to pass the exam, student is not successful, examination committee will be formed as stipulated in article 29 of the Book of regulations on study and exam will be organized as described in documented work procedure for such exams.

Assessment results per each course and assessment models used will be regularly reviewed by QC and compared with students' reactions stated in survey, since they contribute to several KPI's.

3.3.3 Learning infrastructure and resources

In order to support high quality of studying process UCACE developed and purchased in the past two years number of learning resources and infrastructure as follows:

- Infoeduka IT system – on line infrastructure for students equipped with; personalized week schedule, internal messaging subsystem, digital announcement board, forum, repository of documents, library subsystem, subsystem for exams registration and student profile containing; accumulated points, grades, attendance, financial balance, list of borrowed training equipment, list of passed certification exams, repository of formal templates, admission process results, contact data, …
- LMS system with training materials (now for 5 courses), on-line testing system for formative purposes, On-line servers with software systems supporting individual work and exercises (i.e. Microsoft TeamSystem, IBM Rational, …), mail servers and mailboxes, Web conferencing system supported with audio and video equipment in lection rooms,
- 2 networking labs with most advanced technology supporting system engineering study program,
- Library equipped with PC's for learning and individual work (total of 12 seats, 6 with PC's and available 6 notebook PC's for others) and with total of xxx books, subscription on y magazines and on-line databases. If certain book, not published by UCACE is used as a formal literature for a course (i.e. Math, Economy, English language), Library is equipped with at least one issue per each student. If specific book is a recommended additional literature for the course, but not mandatory one, copies for at least 2% of students are available. All books published by UCACE (Algebra) are distributed free of charge and left to all students. Library is also equipped with server infrastructure (total of 6 servers and data storage) that can be used for students to exercise. Work of library is supported with Infoeduka system and is in detail defined in Book of regulation on Library.
- Career centre – in charge of career counseling and support to study and employment; from the admission request of potential student, via motivation and predisposition evaluation as a part of admission process though constant work with students, organization of contacts with employers in order to organize work placement and participation in projects with the industry to support to employment of UCACE's students and maintenance of contacts with alumni. Each student will at least once each year have conversation with Career centre employee to discuss his / hers career pathway, selection of available elective courses, recent situation on ICT Labor market, possible projects and work placement,… All counseling and conversations within career centre will be documented within internal student profile maintained in ELAP system (Electronic Academic Portfolio) – some system options are still in development.
- ELAP system - on-line student portfolio connected to Infoeduka and maintained by Career centre.

Contains tools for students, career centre, teachers and employers; personal student profile, student CV in Euro pass from and other documents relevant for employment, list of received recommendations (formal template for recommendation with evaluation grid is used), list of educational achievements (grades, certificates..), list of active job propositions and open research projects where participation is possible,… System is currently in beta phase and some options are still in development.

- Limited free printing and copying is available for students within the student office.

In addition to listed resources, infrastructure already mentioned in this report (equipment and facility) should be also taken into account as a facilitator for learning success. No additional fee is charged to students for use of any abovementioned resource.

As additional learning resource, work placement and development of final project is already assured for at least 20% of our final year students within partner companies represented in Economic Committee and others. If additional 40% or UCACE's students, who are already employed (mostly in ICT) are also taken into account (they will mostly do their final projects in companies of their employment), it is safe to say that some 50% of our students will have chance to get involved in development projects within the industry. Work placement is regulated within Book of regulations on final project and final exam and additionally with three party agreement between UCACE, student and the company.

In respect to international cooperation and student exchange, ERASMUS fund and reached bilateral agreements with foreign institutions mentioned in chapter 3.1.2. of this report will be used in order to achieve stated KPI. Through the same cooperation and agreements with global technology vendors foreign lecturers already visited (two in 2009/2010) and will visit UCACE. Department for projects and international cooperation will support further cooperation initiatives on institutional level and will support mobility of teachers and students. Information to students on possible international involvement will be provided through Student office and presentations of possibilities to study abroad will be organized for UCACE's students (in 2010 Griffith College representatives will held presentation at UCACE).

3.3.4 Teaching staff

Within priority aim 3 of UCACE's Strategy, which represents HR Policy (and partially research Policy), 8 out of 11 specific tasks cover development of teaching staff in various aspects. It is so because importance of high quality teaching staff from our perspective cannot be overemphasized, while on the other hand creation of such a team takes years of work and investment. As mentioned in chapter 1.6. of this report, UCACE managed to form internal team of 7 full time employed teachers and 4 full time employed assistants in the past two years. With stated number of internal teachers we managed to cover our 123 students and will be able to do so also for anticipated 180 that we will have enrolled, starting from September 2010. If only full time teachers (with educational title) are taken into account, without 4 full time assistants and additional 30 part time teachers and 13 assistants, our teacher to student ratio is now 1:17 and will be 1:25 in September what still satisfies our KPI's, and more than satisfies article 6, paragraph 3 of Sub law on Standards and permission for higher educational activity, pursuance of study program and accreditation of higher educational institutions (Official Gazette 24/10). Current teaching staff structure is shown in next table:

Staff	100% full time employed		full time employed in percentage less than 100%		External expert working 100% in institution		External expert working less than 100% in institution	
	No.	Average age	No.	Average age	No.	Average age	No.	Average age
Phd - College Professor								
Higher Lecturer								
Lecturer								
Phd - University Professor								
Phd - University Assistant professor								
Phd - University Docent								
Assistants								
Technical staff								
Administrative staff								
Other staff								

Table 6. – Teaching staff structure

UCACE's plans for further employment of new teachers elaborated in its HR Policy and formulated also through KPI's will have to be sustained with number of enrolled students. In present circumstances, UCACE will be more oriented to build and upgrade skills and competences of its present employees through internal education for teachers (methodical and andragogic), Phd studies and tailored short education programs, as planned and documented within Staff education plan and to foster research and scientific work.

Formal procedures for teachers' selection and employment as well as the procedure covering elections of teachers to educational titles are defined in Book of regulations on teachers' election to educational titles and constant teachers' training. Stated regulation prescribes required:

- formal education of prospect teachers elected to educational title,
- evidences of scientific work, in line with election criterion brought by Teachers Election Committee within CCUUCAS,
- teaching experience,
- other relevant teaching skills and competences, especially training quality measured during mandatory trial lesson.

In respect to promotion of teaching quality and overall quality culture article 40 of aforesaid regulation defines, in accordance with HR Policy, criterions that are used in order to decide on financial and other prizes for successful teachers. In the past two years, UCACE stimulated better performing and more competent teachers with higher wages.

3.3.5 Monitoring of educational achievements

From UCACE's perspective, private training providers charging tuition fees to their students should act even more socially responsible compared to public institutions, starting from the admission process till the employment of their students and beyond. That idea shaped number of our documented work procedures and Book of regulations on Quality Assurance. It is also transposed to 3 KPI's. In order to support monitoring of educational achievements during the studying process, additional reporting tools were added to already existing Infoeduka's options, while employability of graduates will be monitored with the support of ELAP system as soon as our first generation of the students graduates in 2011.

Process of monitoring starts with admission requests by prospective students, filling in on-line form using public Infoeduka's admission subsystem. As soon as their data and results of secondary education are filled in, UCACE starts tracking quality of its future students. Process becomes more precise once results of high school state graduation exam or UCACE's entrance examination are also added to the system. Using stated information and infrastructure UCACE managed to attract excellent future students using 25 partial scholarships as incentive (in 2010). At the beginning of educational process for each new generation of students, teaching staff are informed by the Dean on admission process results and quality of current generation, in comparison with prior ones.

Monitoring of students' success rates is constantly done for each course at the end of each mid-term exam using Infoeduka system. If any deviation is detected, Dean's assistant for education will contact teacher and discuss with him possible origin of the problem and possible remedy. Detailed report on assessment success rate is prepared by each teacher at the end of semester (latest 15 days after second examination term) as per article 16 of Book of regulations on Quality Assurance. That report, together with students' and teachers' reaction will serve as a basis for overall report on education quality prepared by QC and discussed on special Professional Council's meeting.

Student's progression to higher semesters is also monitored and checked against admission process results in order to better shape entrance examination process (if required) and to upgrade specific courses or assessment methods. Stated results are prepare by QC at the end of each academic year and are discussed within Management Board , Professional and Economic Councils. Profile of student population is observed also per student by; students themselves, institution financing study or parents, teachers and also employees of Career centre. Underperforming students will be automatically contacted by Career centre representative and possible scenarios in order to increase their results will be discussed. Current profile of UCACE's student population is detailed in chapter 1.5. of this report.

3.4. Performance measurement

In UCACE performance measurement is used as back coupling to the QA system in order to measure and monitor achieved results against set desirable thresholds and also as an incentive to change and upgrade procedures and used QA methods (or to change / upgrade set desirable results and develop new ones) as institution and market develops. In order to measure performance and thus quality of its work, UCACE developed and uses three methods:

A) Satisfaction of internal stakeholders

- Student satisfaction survey is done twice each semester, using on-line subsystem supported by Infoeduka. Surveys are anonymous and are filled in on-line during the time set for exercises (in academic year 2008/2009 surveys were filled in on-line at home but only by relatively small percentage of students. In 2009/2010 surveys were filled in during classes and percentage of filled in forms was significantly increased). There are 7 main areas within the survey with total of 40 questions such as; course, teacher, assistant and training materials grading per different aspects (using 0-9 scale), grading of facility, classrooms, equipment and other study infrastructure, work load vs. ECTS from students perspective and in second survey evaluation of improvements in respect to comments given during the first one. First survey is done at the end of first teaching block (after 5 weeks) in order for teachers and UCACE's management to still have time to react if improvements are required. Second one is done at the end of semester. 0 to 9 scale is purposely used because more traditional 1 to 5 scale gives poor representation of real situation due to students' prejudices formed during their prior education when the same scale was used to grade them.
- Teachers' satisfaction, their reflections and recommendations for improvements are gathered through report on the realization of education prepared at the end of semester by each teacher and analyzed afterwards by QC and consequently on special session on quality held at the end of each semester by Professional Council

B) Satisfaction of external stakeholders

- Is measured through survey on new skills / knowledge requirements and quality of UCACE's educational program (with recommendations for its improvement) conducted within representative group of employers in ICT, organized at least each two years with the support of partners (CES, CEA-ICT and CCE).
- In future when our first generation of graduates reach labor market, survey on satisfaction with their skills and knowledge will be conducted annually among their employers in order to get clear picture or the educational process results.

C) Accomplishment of KPI's

- Unlike first two performance measurements that are subjective reflection of quality, built mostly upon personal expectations of those answering the survey questions, more objective and measureable results are gathered through annual analysis of KPI's done by QC and discussed afterwards by all UCACE's management structures (Professional Committee and Managing Board). In order for UCACE's management to know that our QA system really works and that we are in control total of 30 KPI's were introduced within Strategy. They are observed on annual bases and will be amended if necessary each year. KPI's are grouped per Policy (HR, Quality, Infrastructure and Cooperation) and person or department in charge of their monitoring or result acquisition is clearly stated. They are shown in chapter 8 of Strategy given in Appendices 2.

3.4.1 SWAT

Table 7 shows strengths and weaknesses in terms of procedures in operation, quality of programs and education but also possible threats and opportunities.

	Strengths	Weaknesses
Internal	- Study program prepared and maintained in respect to ICT industry requirements, - International certification included inside formal program and not offered through additional lectures, - Experience in maintaining and enhancing quality of education, inherited from Algebra, - Number of documented work procedures prepared based on	- More than one third of our courses were never lectured and they still do not have structure finalized upon real experience in education, - With 35 completely new courses we still have to invest significant efforts and resources to prepare books that are on high qualitative level. Most of the books and training resources are finalized only after few upgrades

	a long experience of implemented ISO 9001 in education process, - Infoeduka system supporting all functions of the institution and open for further constant development and upgrade according to UCACE's priorities (in contrast to ISVU whose development is handled centrally for all institutions), - Career centre, - Each course supported with book on Croatian language, prepared (in most cases) or purchased for the specific course.	upon experience in teaching process, - Absence of additional graduate program, - ELAP system that will be much needed in 2010/2011 is still under development and in Beta phase, - Training program should pass final fine tuning in respect to overlapping elements once all courses are lectured for at least one time, - Newly hired teachers, and especially part time experts are sometimes underperformers despite evaluation done during their selection. When they are changed for unsatisfactory results, complete process should be done again with their successors deteriorating overall quality.
External	Opportunities	Threats
	- Once graduate study is introduced, our graduates will be even more self-employable so planned entrepreneurial incubator can be further valuable infrastructure capable of supporting better connections to industry for all our students, - Started processes of support to VET educational system may eventually result in UCACE enrolling better prospective students what will enable better overall achievements of teaching process.	- If Quality Assurance systems are not introduced fully also to other, especially private, higher educational institutions and students are able to get their diploma easy, with questionable skills and knowledge, there is short term threat that UCACE, strictly maintaining its standards, can lose some potential students to such competitors.

Table 7. – SWAT analysis in terms of procedures in operation, quality of programs and education

Most of the stated weaknesses originate from the fact that UCACE is still in the phase of early development characterized by production of training materials, building of teaching staff, development of IT and other infrastructure and fine tuning of its course execution plans. Some of them cannot be remedied prior to UCACE's own experience is build (it is hard and dangerous to skip steps in institution's development) and other will be reduced by additional investment yielding in delivery of results faster (i.e. ELAP). Stated threat, noticed from our own experience during admission process, is also side-effect of still undeveloped quality culture and lack of social responsibility exhibited by some institutions.

3.5. Quality improvement

Well designed, documented and holistic QA measures supporting all significant institution's processes still have no effect if they are introduced only in order to pass formal assessment (i.e. re-accreditation) and if management have no determination, vision or courage to benefit from them through constant, and if required, serious improvements and changes. Maintenance of status quo is immanent to higher educational system as a whole and concept of academic autonomy (on any level) is often misused for the purpose. Most opposition to change is present in older and already established higher educational institutions (such as big Faculties or University) where all decisions are dominated by Professional Councils and Institution's management is elected (or opposed) the same way.

In that respect, UCACE's weakness of being new and non established institution served to the management actually as strength in order to introduce climate and culture of responsibility for quality on personal level from the very beginning. UCACE, originating in a way from market oriented adult and life log learning education, introduced reactions to stakeholders' inputs (or quality improvements) even before they were documented in the work procedures, and when QC and Policy on Quality Assurance were still distant future. UCACE now has quality improvement procedures incorporated in a number of internal regulatory acts and in documented work procedures, in accordance with its vision. Activities and recommendations for improvements originates from QC and are distributed to all management structures.

3.5.1 Program improvement

Constant program improvement is important strategic goal set in tasks 13 and 33 of UCACE's Strategy. In that respect, program is constantly evaluated as already described in chapter 3.4. of this report and when serious changes are to be made, Program Panel will be set up coordinated by Economic Committee to handle such task. Program structure for existing and new Graduate program was discussed by Economic Committee, while fine tuning within existing courses is coordinated by Professional Council upon received QC recommendations.

3.5.2 Improvement of education

Improvement of education is also important strategic goal set in a number of tasks within the Strategy, and its numerous aspects are documented in work procedures and internal regulations. It originates from QC upon periodic performance measurement (as stated in chapter 3.4.) and also from received compliments or improvement recommendations given by internal or external stakeholders. Dean and other managing structures decide upon improvement measures, actions and possibly projects in accordance their authority stipulated in Statutes. During first two years of UCACE's existence, number of improvements in respect to education were undertaken as follows:

- 3 underperforming teachers were dismissed after 1st semester of 2008/09, 2 after 1st semester of 2009/2010 and 1 after 2nd semester of 2009/2010,
- Total of 3 books were significantly upgraded/changed after being used in education for the first time and all other books were slightly improved,
- Infoeduka system was improved with the number of new tools and some existing tools were also improved upon received recommendations,
- Formal procedures and supporting documents for teachers were improved significantly compared to its first versions,
- Meetings with yy professors and assistants were organized upon results of student surveys in order to reach improvement,
- Weekly schedule of study was changed in respect to students' recommendations and 2 week off for mid terms was introduced for the first time in 2009/2010,

UCACE used external reports and data (i.e. FER's program assessment reports 2008 and 2010, employers survey 2009 and 2010) in order to improve its educational process and / or program. Such data is published.

3.5.3 Improvement of resources

As with education and program, improvement of resources (Infrastructure and Human) are also strategic aims detailed within the Policies. Infrastructure improvements were significant in the past two years and are already mentioned within this report.

Improvement of human resources is further stipulated within Book on Systematization and Organization of work places and responsibilities and Book of regulations on teachers' election to educational titles and constant teachers' training both backed up with corresponding Annual education plan. Sole increase in number of employees and especially teachers, their participation on local and international conferences and newly published scientific and research papers could be interpreted as measurable HR improvement.

With Career centre and Student section (internal student organization), both introduced in 2009, UCACE improved part of its student support services. Further improvement was also made in 2009 when regular free use of Gym for students was introduced. In 2010 students were given the opportunity to borrow note book personal computers for home study, free of charge.

3.5.4 Expected future improvements

Most of the expected organizational and infrastructural improvements are foreseen within the Strategy. Still, they in some respect depend on future income (related to number of enrolled students and research projects) and outcome of Graduate study program initial accreditation process that will start shortly. On the other hand UCACE will certainly be able to achieve improvements in respect to its educational process and study program quality, once full three year circle is finished and each course is lectured at least once. We expect that as a result of program and courses fine tuning UCACE will have more stabile program with all courses developed to the same level, what will required fewer interventions and involvement in teaching process, allowing our quality management to be more focused on future more fundamental improvements.

3.6. Organizational structure

Organizational structure of UCACE was shaped by one external and two internal factors. National legislative in the field of higher education imposing structure and responsibilities characterized by

Professional Council, Managing board and the Dean, stipulated also in UCACE's Statutes, was certainly external influencing element. On the other hand determination towards Quality and Cooperation, stated in our Vision and Mission, were other two internal factors. Acting together they formed our present organizational structure which is in principle similar to the structures of other small higher educational institutions with few obvious differences; strong position of Economic Committee as the initiator of cooperation and program development and strong support to education process (to teachers and students) through number of departments in the sector of education.

3.6.1 Responsibilities and decision making process

In order for internal organization to be effective, both in respect to every day operations and policy development, responsibilities of employees are stipulated on personal level (through personal list of responsibilities and through documented work procedures), and also on the level of organizational unit (i.e. department) while responsibilities of external stakeholders are just mentioned on the organizational unit level. From employee's standpoint, most important document defining internal organizational structure is personal list of responsibilities where, for each responsibility there is also its origin (i.e. Book of regulations on Study) and if applicable expected result in accordance with institution's mission and vision (i.e. KPI). Responsibilities in respect to QA system are not separated from other responsibilities on personal employee level because most of the employees are one way or another involved in activities closely connected with QA. Also, Quality assurance procedures are incorporated in specific regulatory documents (such as Book of regulation on QA) but are also stipulated in documented work procedures that are not fully connected to QA activities. When, for instance, some information relevant for QA is required from employee working in specific department (i.e. marketing) he / or she is for that task responsible to President of QC and not to his superior in formal organization (head of marketing department). It can be concluded that in a way, QA is incorporated in UCACE's organization using a matrix organizational model. Other more classical roles such as; educational activities, funding activities, the selection of teaching and administrative staff, the selection of students, research… are organized within corresponding departments and most of them are backed up with books of regulations or documented work procedures. Evaluation of achievements and performance in respect to personal responsibilities is done for each employee during the annual interview with the Dean, which results in revision of current work contract (i.e. bonuses, wage increase…) and may be done more often if significant underperformance (over performance) is detected.

Roles in respect to policy development, services to society and influence on social planning on national level are not supported by documented work procedures but are instead described in the Strategy and backed up with KPI's if possible. Responsibilities in that fields are determined on wider perspective because external stakeholders and elected representatives are often involved in them.

Decision making process is clear and set within published Statutes. Recommendations got from QC and Economic Committee are progressed to the highest managing structures in order to improve procedures and even policies, posing altogether solid grounds for further development (on operative and policy level). As a result of management decisions action plans may be amended, new organizational rules may be introduced and different decrees may be issued. As a small institution with only one program, UCACE do not suffer of mixed visions, split responsibilities and unclear decision making processes what may be a problem in bigger institutions with high level of internal autonomy passed to organizational or program units

3.6.2 Involvement of stakeholders

As already described within this report, all relevant stakeholders (internal; staff, students and external; employers, partners) are involved in the cycle of evaluation and improving internal quality. They participate not only as initiators of the change (i.e. student or employer filling in the survey), but are also involved in decision making process in respect to operating procedures (Students in; QC, Professional Council, Employers in Economic Committee) and policy (Committee for Strategy).

3.6.3 SWAT

Table 8 presented on the next page shows SWAT analysis of UCACE's organizational structure:

	Strengths	Weaknesses
Internal	- Structure and the position of the Economic Council, - Experienced departments for; literature publishing, and international projects and cooperation with top external experts fully involved, - Organizational structure populated with many top class employees having cumulative employment also in Algebra,	- Lack of experience and knowledge in respect to organization of education process in higher education, - Lack of experience in international research projects (i.e. Framework 7,…), - Some internal procedures are not yet developed or if developed they have never been tested in real environment (i.e. contracts with employees in respect to work placement for students,…)
	Opportunities	**Threats**
External	- More top quality experts with scientific and organizational experience can be attracted to UCACE if its reputation in the future increases due to its vision and overall performance.	- If number of students is not increased in the next years, UCACE will not be able to fully develop its internal organization and implement new structures (i.e. entrepreneurial incubator, support to knowledge clusters)

Table 8. – SWAT analysis in terms of organizational structure

4. CONCLUSION

UCACE's strong determination towards quality can hardly be overseen. It is best visible in already achieved improvements and development; from training materials to facility and international project in QA, to name just a few. It can be also red from UCACE's organizational structure, internal procedures, its vision and strategy. It was here all the time, even before first short term strategy was brought and its vision depicted. Origin of such determination ranges from social responsibility and obligation to deliver value for money to sense of dignity and responsibility for development of national economy. It was and still is strong intrinsic motivator initiating further development.

Its implementation evaluated in this report, as mentioned in the preface, is a snapshot taken in time. Taken during the phase of early institution's development, after two years of operation in turbulent environment characterized by changing legal framework in higher education and recent change in government's approach towards financing of public programs.

From our perspective UCACE managed to incorporate its determination and vision in every day work and operating procedures to the satisfactory extent, while its awareness of weaknesses and tasks left unfinished will certainly serve as incentive and obligation to further improvement.

5. APPENDICES

1. Organizational scheme of UCACE
2. Development Strategy of UCACE for period 2009 – 2013