ECONOMIC CRISIS AS CATALYZER OF CLOSER COOPERATION BETWEEN UNIVERSITIES AND INDUSTRY

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Abstract — *Economic recession needs to find new impulses for prospective economic rise. It will not come without new products, new dynamics and new ideas. Open heads – as best sources of new managers and technicians for sustainable dynamic development of companies and society - is necessary to find during their studies at universities. Integral part of study program of Information management, which started 15 years ago at the Technical University of Liberec, is two semesters long supervised industrial placement. With our experiences we found very positive aspect in crisis: companies see human potential that can be educate in appropriate way based on the closer cooperation between both partners. Our new project "THEORY AND PRACTISE" that started in June 2009 is financed by European Social Fund. The full paper will describe its main goals and results of practical placement in the time of crisis.*

Index Terms — Cooperation, crisis, dynamic development, human potential, partnership, work experience.

INTRODUCTION – DEMANDS FOR CLOSER COOPERATION

The time of economic and financial crisis brings difficulties for majority of companies. For passing a hard time they need to stay attractive – much more then before – for current as well as potential customers. They need to find new impulses, ideas, products that are attractive for current and prospective markets for simply maintenance of their existence. In the time of knowledge economy there is just one source for being successful in crisis competition – to open doors for best brains. In other words – they have to support educational process for the preparation of new types of managers. They need to be able to select and use potential co-workers as soon as possible – preferably during their studies.

With a small delay – based on the inertia of government money-flows – the economic and financial crisis affected in the Czech Republic the whole educational sector and especially universities. The lack of financial resources indicates the potential of fall-down of quality of education process. On other side for very hard time is necessary to prepare well-educated people that will be able dynamic manage modern businesses. The base for their professional activity is not only ability to apply technologies but also knowledge of economic disciplines and their practical effects supporting with attainments and ability of using of information technologies. It is necessary to find optimal way for "winner-winner" cooperation between these both worlds. As an excellent way – especially in the time of economic crisis we found long-term industrial placement in the frame of engineering BA program.

During last 15 years I informed the IGIP society repeatedly about our project to educate students of Managerial Informatics accordingly with needs of real business world. The major aim of this program (started in 1993 at the Faculty of Economics, Technical University of Liberec, Czech Republic) was to equipped university graduates with a spectrum of knowledge, abilities and experiences in accordance with demands of their real or potential employers. We repeatedly realized research about demands and needs of business environment for our graduates. Main stable topic between demands was to teach students to work on projects in teams. Their education has to be as near as possible to business reality.

In the past time universities and faculties of economics represented relatively stable, independent and rather isolated centers of science, research and technology. Graduates of university programs brought the whole of their knowledge to their new jobs and firms. That positively affected activities and development of these institutions. Research centers and university departments developed, formulated and designed new ideas and theories. They often represented base trends of education for tens of years. It moved praxis ahead – but mostly with a certain delay – from demand of industry and society through development of theory and "production" of graduate's knowledge.

The rapidly growth of dynamic in business life induced change of this situation. Firms especially in the time of economics crisis no longer have time to wait for stimulus from university research centers for a change in their behavior. They have no chance to be satisfied with former delay. They need to react dynamically to changes of competitive surroundings, market, global and local influences – especially in context of possibilities in new information technologies.

One of the most important effects of this situation is a change in demands for qualifications of graduates of economical faculties. In addition to "traditional" disciplines more and more requirements for "human capability" dominate - to be useful member of companies. For

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companies to thrive and move forward it is necessary to establish radical changes affecting whole organizations: examples of them are delayering, outsourcing and growth of multidisciplinary teams.

The last broad research about demand and supply analysis of ICT specialists in the Czech Republic [6] was realized in 2008 by University of Economics of Prague. Demands of firms and companies for different types of IT specialist were compared with the profile of graduates of faculties of economy with their specialization in informatics. An example of this research is shown on the Figure 1.

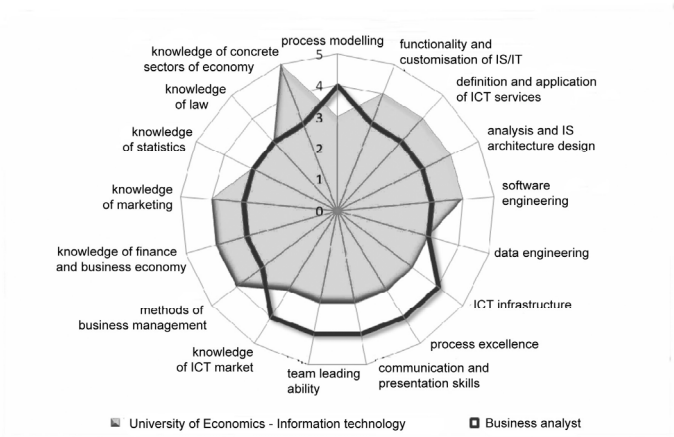

FIGURE. 1
PROFILE OF IT GRADUATES AND DEMANDS FOR PROFESSION OF BUSINESS ANALYST [10]

Main results of this project are presented in [1, 10]. Research in the field of ICT started to be an inspiration for research in other disciplines as well. The results of them are mostly very similar. They stress attention of university managers to close cooperation with real or potential customers (firms, companies) of their products (students). The ideal way - that is currently supported by Forum of Industry and Universities - is the cooperation in the frame of long-term practical placement based on the integration of students into project teams of individual companies.

PRINCIPLES OF LONG-TERM PRACTICAL PLACEMENT – WORKING WITH PROJECTS

Supervised work experience is still an exception in Czech university education. That is very important to explain again and again the role and principles of long term industrial placement to current and potential students, firms and society. We found industrial placement as the base for getting experiences and developing of competency and capability of application of theoretical knowledge in the frame of regular study. Wisdom in the field of "Managerial informatics" is possible to get only through integration of wide theoretical knowledge and practical experiences and skills.

To organize such kind of co-operation between university and companies is an endless process. Management of placements needs full engagement of involved staff. The responsible partners at collaborating institutions (supervisors, top management) are changed very often. It is very difficult to build up a stable partnership. Nevertheless all the time is necessary to involve new partners for co-operation.

After very week support of such kind of cooperation between universities and business surroundings at ninetees the Faculty of Economics got two EU grants for improvement and extension of relationship of cooperating partners. We got the opportunity to modify and accredit by the Czech Accreditation commitee the whole BA and MA program of Managerial Informatics. Important partner and inspirator by this work was IBM company with its SSME approach. We modified and adapted majority of modules in acoordance with Service Science, Management, and Engineering. We also reformulated majority of formal procedures, that allowe to impove feedback on current placements ass well as the preparation of new activities.

Long time of experiences with implementation of long-term supervised industrial placement into regular study program give us right to say, that such part of study programme is very useful for all partners – students, university and companies. The practical experiences allow us to find "value-added" topics, which can improve process and results of this part of study as well as the whole programme. Long-term practical placement allows us also to harmoniously implement principles of project-learning as integrated part of many modules.

Principles, process and procedures of long-term practical placement are described in Figure 2.

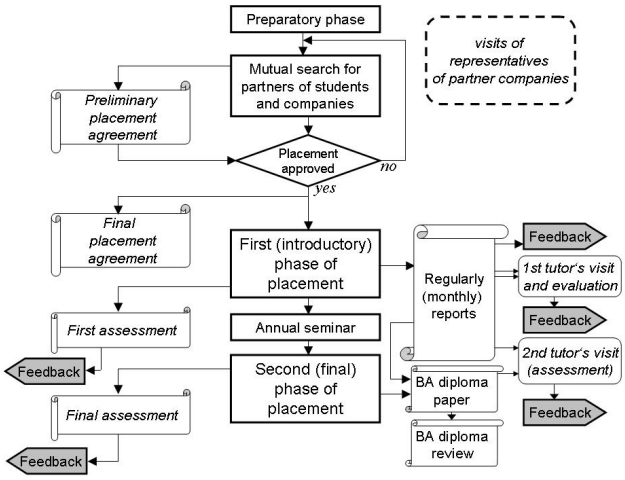

FIGURE. 2
MAIN PROCEDURES, OUTPUTS AND FEEDBACK OF PRACTICAL PLACEMENT

Assessment plays very important role in the management of practical placement. It is the base for relevant feedback that allows improvement and/or changes of placement activities.

During placement period visiting tutors need to be informed about the running of the placement. For this purpose students have to elaborate three kinds of assignments. "Periodic Record and Analysis" is completed monthly by the student. Purpose of this document is to serve as a record of work done, problems encountered and knowledge gained. It encourages students to be critical of their performance with an aim to improve it. It is used as a discussion document for visiting tutors. As a base for the 1st assessment students prepare at the end of the first semester "Current Report and Organization Analysis". It consists of an activity analysis and organization analysis. It brings a short report detailing various aspects of the organization with a purpose to investigate and analyze the work environment and understand the wider aspects of the company. Students are also assessed by placement supervisors, but this assessment is more or less used for self-reflection of students and of their position in company.

The major time in the 2nd phase of placement is used for real work on real projects that are in conjunction with BA diploma paper. Its structure and content are based on main project activity during placement. We find as one of main advantages of such procedure that students are solving not just a paper that no one will read and used after their final exam but which are valuable for companies as well as for the university.

All documents are available for 1-st and 2-nd year students. They are very precisely informed about co-operating organizations, previous placements and its possibilities. It's very necessary for them to choose an orientation to a special topic of potential placement as soon as possible. Student's reports incite a strong feedback with regard to contents and form of placement. Reports from one company during few years give very good view on the position of company, its possibilities and support of placement students in the organization.

We found very important "value added" effect for post-placement students. They are very interesting in information about work experiences of their younger colleges. Increasing number of students stayes "in touch" or in working relations after their practical placement. Majority of them are "affected" by topics if their BA filnal projects and continues to to solve deeply similar problematics in master diploma works.

CRISIS AS A NEW CHANCE FOR COOPERATION

Current time could be present as a mix of economic, environmental, political and technological factors, which together produce a rapidly changing and turbulent context. This influences not only companies but – with an inertia-based delay also universities.

Many universities developed or are working on an employability strategy, which sets out how students and graduates will be assisted to develop capabilities for the workplace. Students increasingly look for work experience opportunities as part of their degree experience. This has been accompanied by an increasing drive to involve employers in a range of ways within course provision. Active employer involvement in creating placements and projects is essential, and there is a need to look at how the employer relationship can be created, managed and sustained in the interests of the employer, university and students [5]. Economic crisis prepared for our placement management very pleasant and unexpected surprise – the interest of companies for the cooperation in placement activities is over the number of placement students.

The position of placement supervisors got through last years also very high importance and the quality of BA project papers dramatically exceeded the level of papers of "normal students". Crucial point of successful placement period and meaningful high quality final BA project is a preparatory phase of placement. In this time is necessary to identify demands and needs of firms and companies and interest and abilities of students. That is a platform on which is able to build prospective partnership. As the first result of this "courting" is the setting up of area of main placement activities. It is the base for defining the titles and outlines of final works that have to be set out during first two weeks of placement period (many students start their cooperation with placement companies sooner).

As an example of fruitful cooperation I can introduce well-known car producer Skoda-Auto in Mlada Boleslav with its Department of Quality Management. Topics of project of our students have mostly continual face – new students are building their projects on the results of previous ones. Final BA papers have theoretical as well as very practical content and are used by company, e.g.:

- Information systems for quality control in automotive industry,
- Evaluation of process management in production of new car A5,
- Application of Pocket PC for data collection for Quality information system of Skoda-Auto,
- Problems of migration of firm's IS to concern's IS in Skoda-Auto,
- FMEA methodology in theory and practice,
- Optimization of SQS Global II system on the base of statistic processing of outputs.

Especially at the time of crisis most of more then hundred cooperating companies are permanently asking for placement students. They set up the integration of our students into project teams as regular base for their activities. We permanently try to cover by placement students the broad spectrum of different activities and orientation. That brings a good chance for sharing and

dissemination of information from different types of businesses. Also we try to place our students not only in Liberec and its surroundings but also in other parts of the Czech Republic, especially in Prague.

Table I brings examples of cooperating companies and firms with they areas of main business activities in last years.

TABLE I
EXAMPLES OF COOPERATING COMPANIES

Name of company, town	Type of company
Skoda-Auto, Mlada Boleslav	*Production companies*
Grupo Antolin Bohemia, Chrastava	
Unilever, Prague	
Procter and Gambler, Rakovnik	
Nestle, Prague	
Czechoslovak Bank of Commerce, Liberec	*Banking and brokers*
Creditanstalt, Prague	
Prefin, Liberec	
Creditanstalt, Prague	
PVT, Praha	*System integrator and/or consultation companies*
Siemens, Prague	
HB Consulting & Partners, Prague	
OR - CZ, Moravska Trebova	
K2, Prague	
ITEG, Prague	*IT services*
MITON CZ, Jablonec nad Nisou	
Liberecka IS, Liberec	
CSC Computer Sciences, Prague	
First Multimedial, Prague	
Arthur Andersen, Praha	
SPT Telecom, Prague	
BD Soft, Prague	
MUZO, Prague	
Air Navigation Services, Prague	Services
Attest, Liberec	
Security Services, Jablonec nad Nisou	
Domesticum, Liberec	
Airport., Prague	
Czech Radiocommunication, Prague	
Czech Post, Liberec	

Illustrative example of cooperating company is OR-CZ Moravska Trebova. OR-CZ started at the beginning of nineties as a system integrator and distributor of own information system OR (Ortex). Through time they extended their activities to many other areas – from information systems for local authorities to support and information systems for medical care and hospitals. Heads of this company found very quickly invention and potential of placement students. They repeatedly declare the contribution of our students for a company. The company offers students every possible support to be right members of project teams – from the necessary literature through participation at useful courses and conferences to consultations with experts inside as well as outside OR-CZ company.

Table II brings an overview of titles of BA final papers from last two years. All of them are realized and used as integrated part of real project in companies. For majority of students the final exam and graduation means just start of postgraduate study and continuation in cooperation with placement companies.

TABLE II
EXAMPLES OF TITLES OF BA FINAL PAPERS, 2008-09

Headline of BA Final Paper	Company
2008	
Software tools of project manager	ITEG
The role of the project manager in organization	
Project management techniques	
The future trends in using of internet in marketing	K2
Suggestion of principles for building an e-commerce	MITON CZ
Development of web pages and application	
Analysis of tools for essential progress of web applications	
Theory of inventive problem solving	Skoda-Auto
The global development of the system of quality in Liberecka IS, a. s	Liberecka IS
The concept of optimalization of LAN controlling	Liberecka IS
Usage of information system in personal agency as a tool for increasing competitiveness	Attest
Progress of information systems for SME	
Support of information systems in education and suggestions for their improvement	
Using information technology to support project management in the field of human resource development	
Using of business intelligence tools for the risk analysis	BD Soft
2009	
Optimization of information system for customer management in air transport	Airport Prague
Key success factors and risks of project management	First Multimedial
Aspects of the work of project manager in the preparation and management of projects financed from European Union funds	ITEG
Project management approach	
Determination of risks in the FMEA process	Skoda-Auto
Statistical methods of quality management	
The application of the uniform fault address (EFA) in systems used by Skoda-Auto a.s.	
Groupware systems in use for integration of information systems in municipal offices with extended competence	OR-CZ
Development of new information system according to a survey of customers	K2
Proposition, realization and managing of an internet project	Miton
E-commerce as a tool for enhancement of competitive advantage	
Increase of competitiveness of small company by implementation of ISO standards environmental management	AGBA
Social aspects in information security	Security services
Concept of user's data protection	Liberecka IS
Optimalization of the operations at IT service desk	CSC Computer Sciences
Suggestion of module IS for project management	Attest
Access to Microsoft SQL Server 2008 Business Intelligence via the Internet	BD Soft

Long-term industrial training does not finish at the end of work-experience, but it represents a solid base for project

learning at the master level. By the way – about 50 % of students continue in some form of cooperation with placement company. We perceive knowledge and experience exchange as very important profit of post-placement students. Every year we organize the annual meeting for all students of Managerial informatics programs. There is enough time for informal discussions between students of all levels. MA students can confront own experiences with mostly significant shift of activities and projects of placement students and co-operative companies. They can use knowledge of new modules and apply newly gained theories for a new view on their previous projects and projects of their colleges...

The next role of the annual seminar is an exchange of ideas between placement-supervisors, responsible managers of companies and university tutors. Final year's students get enough space for formal and informal discussion with responsible representatives of companies. It often forms main topics of their diploma work. The annual seminar is also an ideal possibility how to disseminate individual experiences and acquaintance and extend spectrum of knowledge of students.

CONCLUSION

The time of economic and financial crisis asks for new types of managers. For very hard time is necessary to prepare well-educated people, that will be able to dynamic manage modern businesses. The base for their professional activity is knowledge of economic disciplines and their practical effects supporting with attainments and ability of using and application of information technologies. The optimal way for getting such personal skills is a long-term industrial placement. Students are often bringing to companies inspiration and non traditional ideas for improving their core processes. Practical placement is getting good chance to companies to be closer to universities – sources of modern managerial approaches and powerful information technologies.

Difficult time of crisis offers companies to start to change their behavior – to use the potential of students and university employees. Successful cooperation is based on three main aspects bringing advantages for companies:

- Inspiration for innovation
- Nontraditional procedures of students
- Testing of prospective co-workers

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