

Design of “Business Informatics” Study Program Model, Curriculum and Perspectives

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Abstract

In this paper a study program of “Business Informatics” at the Wrocław University of Economics, Poland, is presented. The structure of subjects taught and organization of the curriculum for Bachelor and Master levels are detailed. The education model is presented along with descriptions of profession-oriented modules. The authors discussed also a comparison of the new program of Business Informatics and a previous one, called “Informatics and Econometrics” that was common and official program of applied informatics in business schools in Poland. The perspectives and the constraints of program implementation of the new field of study are indicated.

Keywords: teaching model of business informatics, bachelor and master studies in business informatics, curriculum of business informatics

Introduction

A study program "Business Informatics" is the result of years of research carried out by the Institute of Informatics, University of Economics in Wrocław on the improvement of teaching programs in applied informatics at business-oriented faculties (Nowicki, 2004, 2005, 2006). These studies showed that the current diplomas in “Informatics and Econometrics” satisfy only part of the growing business needs in Poland. University’s and the Polytechnic’s programs in Computer Science do not train specialists in business-oriented IT. Higher education in Poland in this area is unfortunately quite delayed in comparison not only with the highly developed European countries (Helfert, 2008), but also to countries such as Romania, Bulgaria, Ukraine, where the programs labeled "Business Informatics" (in German: *Wirtschaftsinformatik*, fr. *Informatique de gestion*) have also got during the last few years a great interest and popularity.

In preparing the plan and program of study, we have tried to implement the standards and good European practices, so that on the one hand meet the needs of the enterprises and institutions, and

on the other hand stimulate the mobility of students and teaching staff. The design took into account current trends in overseas education and standards - primarily ACM (Association for Computing Machinery) and IEEE (Institute of Electrical and Electronics Engineers), but also programs in universities such as the Universities in Dublin, Hasselt, Leipzig and Nancy (Gesellschaft für Informatik, 2003; Gorgone et al., 2003;

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Topi, et al., 2007). An important characteristic of a degree in "Business Informatics" - inspired by foreign universities – is customization of education, involving the introduction of a large offer of elective courses. Students are able to select an educational path and professional training with advice from a tutor. Following the leading foreign universities, in the curriculum of both levels (Bachelor's and Master's) offered, the student may follow one of two paths, namely: professional – allowing to work immediately after graduation, and scientific – allowing to follow the research-oriented program heading to a doctoral degree.

To increase the attractiveness of the curriculum and pragmatic aspects of business informatics a large number of outstanding practitioners and foreign specialists will take part in the training program.

The structure of the article is organized into four sections. After the presentation of the general ideas of the project, in the next section the levels of education will be described, and compared the new study program with the existing in Poland standard of "Informatics and Econometrics". In the third section, the education model will be presented along with descriptions of profession-oriented modules. The last section highlights the conditions and program implementation in the international context of this project.

Levels of Education

Two levels of education are planned for „Business informatics” studies: Bachelor level and Master level (Korczyk, 2009). At the Bachelor level, studies are aimed at giving students basic knowledge on computer science in widely understood business and management context. Apart from general economic knowledge, studies will give the graduates practical skills in using computer tools for business processes. The students will learn (among others) methods and techniques of information systems analysis and design, business-oriented applications, database technologies, fundamentals of e-business, methods of projects management, and also problems of software and hardware marketing.

The business and technical knowledge gained by the graduates, as well as the abilities to use it practically, will be useful for them to find work as information system analysts and designers, application programmers, database administrators. Responding to the market needs, the main focus in the course of studies is the information systems in Small and Medium Enterprises (SMEs).

Compared to the standard of "Informatics and Econometrics" at the Bachelor level many new subjects have been introduced, such as:

- Legal and ethical aspects of IT,
- Theory of management,
- Operational management,
- Organization and functioning of SMEs,
- Fundamentals of computer systems,
- Statistics for business,
- Analysis of information systems,
- Fundamentals and models of business,
- Development of information systems,
- Economics of information systems and undertakings,
- Communication technologies.

In the course of studies, students will have the option to choose 540 hours of different subjects (120 hours on non-stationary studies), grouped in so-called modules, corresponding with specializations and professional profiles of graduates. As the program is complex, students will get advice from a tutor.

Compared to the standard of "Informatics and Econometrics", the new study program is considerably different. The differences concern both the basic subjects, as the specialized ones:

I. Basic contents

- a. Lectures in economics and law have been combined while preserving the same number of hours (90 hrs.).
- b. Lectures in finance and accounting have been combined while preserving the same number of hours (75 hrs.).
- c. Lectures in business informatics have been replaced by program contents in scope of fundamentals of information systems – 30 hours.

II. Specialized contents

Beyond the program contents including information systems design, and databases, the specialized courses of the standard of „Business Informatics” contains also:

- a. Mathematics and statistics for business – a group of subjects giving knowledge on modern mathematical tools and quantitative methods (135 hrs.).
- b. Analysis of information systems – knowledge on methods and tools of analysis of information requirements (30 hrs.).
- c. Programming languages – important subject introducing computer programming and implementation in business environment (45 hrs.).
- d. Information system development – subject aimed at giving students of “Business Informatics” mainly practical knowledge on information system development for SMEs (30 hrs.).
- e. Business models – a group of subjects giving students skills concerning operation of modern business (30 hrs.).
- f. Communication technologies (30 hrs.) – as separate subject – because of its importance to business practice, especially in SMEs. In the ministerial standard the elements of “communication in business” are only present as a part of the subject “Business informatics”.
- g. Economics of information systems and undertakings (30 hrs.) – a subject that presents methods and tools of economic assessment of information systems implemented in an enterprise.

The study program “Business Informatics” on the second level is a natural continuation of the study program on the first level, but it could be undertaken also by graduates of other studies with computer science profile, as engineering informatics, or with economic profile, as management, accounting or finance.

The aim of the second level training is to provide a deeper knowledge on information technologies and tools supporting business activities. Students get knowledge on important issues of information systems in enterprises: advanced management information systems, computer systems security, software engineering, information system integration, Business Intelligence tools, artificial intelligence methods, knowledge acquisition and problems of information society.

As in the case of Bachelor studies, also on the Master level a number of new subjects have been introduced, compared to the standard for "Informatics and Econometrics". These are the following:

- Strategic management,
- Law, ethics and intellectual property,
- Managerial accounting,
- Managerial finance,
- Decision Support Systems for business,

- Outsourcing and insourcing,
- Business process engineering,
- Network and Web services,
- Methodology of information projects management,
- Effectiveness of informatic undertakings,
- Business Intelligence in enterprises,
- Data mining,
- Business plan,
- Forecasting and simulation in business.

On the Master level – as on the Bachelor one – students will be offered a highly individual way of studying, thanks to the possibility of choosing modules and subjects. On stationary studies, there is a possibility of choosing 180 hours, on non-stationary ones – 54 hours. It should be noticed here, that the last of the modules: Research and development business informatics – is aimed at preparing students to undertake the third level of education – the PhD studies.

Comparing the standards for „Business Informatics” and "Informatics and Econometrics", one can notice the following differences:

I. Basic contents

Basic contents of the study program for „Business Informatics”, compared to "Informatics and Econometrics", are enriched with groups of subjects containing: managerial accounting (30 hrs.), managerial finance (30 hrs.), strategic management (30 hrs.) and Decision Support Systems (30 hrs.), which stress the orientation of studies on business informatics.

II. Specialized contents

- a. Subjects concerning applications of new technologies in business: Business Intelligence in enterprise, and Data Mining (together 60 hrs.).
- b. Subjects concerning management of IT infrastructure: outsourcing and insourcing, business process engineering, network services (90 hrs.).
- c. Subjects concerning important components of systems design and programming: methodologies of computer project management, software engineering (also present in the study program of “Informatics and Econometrics”), and effectiveness of IT undertakings (together - 90 hrs.)
- d. Subjects concerning widely understood business planning: business plan and forecasting and simulation in business (together - 60 hrs.).

Summing up, the newly created study program “Business Informatics”, that differs significantly from the study program of “Informatics and Econometrics”, is an answer to challenges of modern business environment and to the professional expectations.

Model of Professional Education

Two levels of education presented in the previous section of the papers (covering Bachelor and Master studies) are based on the modular set of teaching courses. In fact, these modules fulfill specialized education requirements oriented towards knowledge and professional competencies acquisition in business informatics domain.

A. Model assumptions

The above described assumptions for education model were taken into account that shaped a functional and structural layer of the designed study program. Therefore:

1. Proposed specialised education modules correspond to labour market expectations in the nearest future.

2. Individualisation of education is emphasized, consisting in a large number of elective courses. It should be noted that students, during selection of the educational path and related subjects, are supported by tutors.
3. Participation of business practitioners and foreign professionals is assumed in the teaching process and they can influence on attractiveness of educational offer improvement and adjust of a graduate profile to the market needs (Nowicki, 2006, s.128, tab.9.1).

Including presented assumptions, specialised education model on business informatics integrates all courses unifying different aspects of professional studies. Thus specialities of Bachelor and Master study are included in the designed education model.

B. Specialisation education model at the Bachelor level

General form of the education model is presented in Figure 1, where particular structural units of education are demonstrated. The current standards of education have been the starting point of program modeling. It is worth to note, that all education programs have been adjusted to the graduate profile and expected professional skills. Specialisation modules (that are simply professional positions) are the central issue of the designed education. Five principal professional categories on the labor market have been distinguished:

- Module 1. Information system analyst and designer
- Module 2. Database analyst
- Module 3. E-business
- Module 4. ICT specialist
- Module 5. IT specialist in Finance

Each module covers a defined number of study hours to select from the list of subjects, but:

- 2/3 study hours of subject module are subjects that form a particular professional profile. These subject are defined by a commission responsible for the major organization and specialization profiles. Subject offer in each module significantly exceeds necessary of 2/3 hour pool, so additional lectures can be taken if a student is interested of a profile that does not conform to the predefined professions.
- 1/3 study hours refers to additional courses that completes of the chosen specialty. These courses may come from the other modules or other majors existing at the university. Sometimes it can be courses for new appearing positions.

The final stages of Bachelor program are the internship, writing of the bachelor diploma and passing a final exam. Completed bachelor studies allow starting professional career or continuing studies at the Master degree.

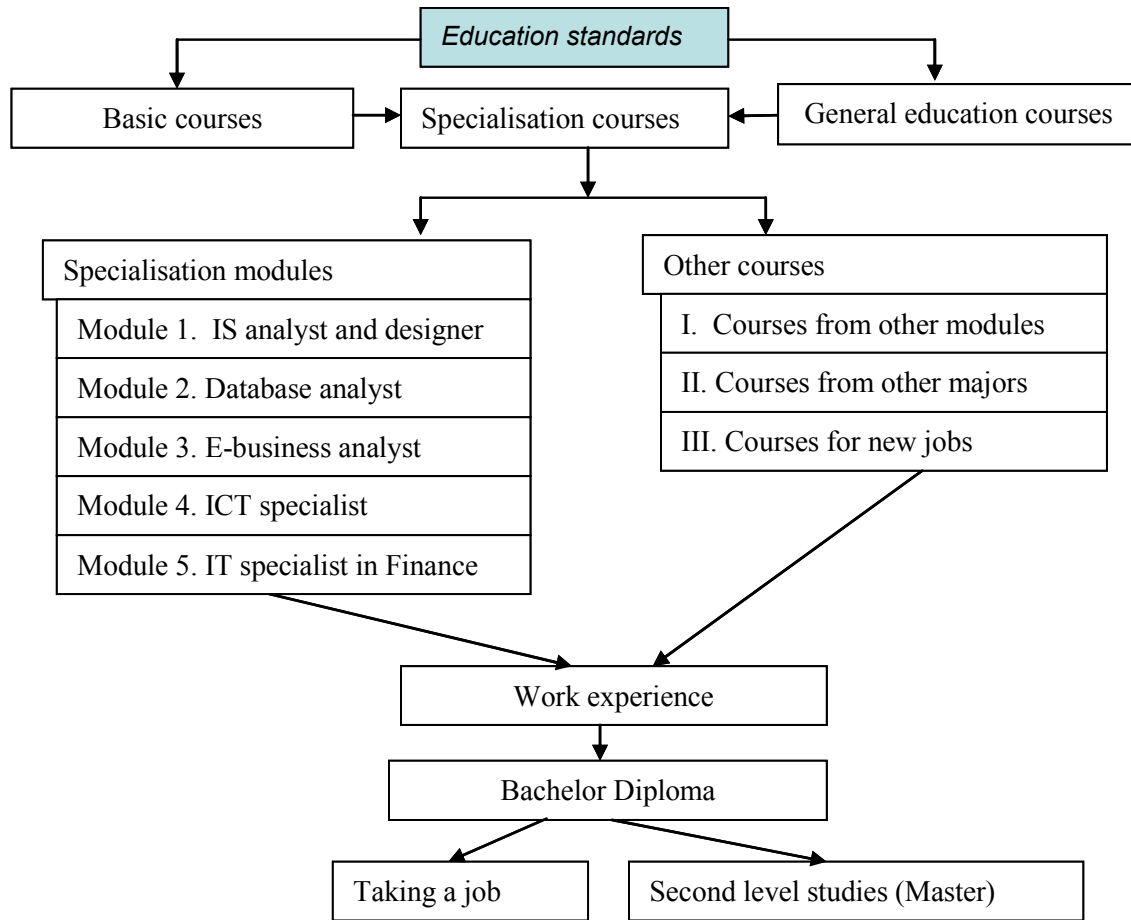


Figure 1: Program of education at the Bachelor level

C. Specialisation education model at the Master level

Education model at this level is presented in Figure 2. Also in this case, the education program has been designed taking into consideration the labour market needs. According to the assumption two education tracks are introduced: professional and scientific.

Education program in professional track is based on student selection of a specialised module completed by other courses from the university curricula. In the project, four specializations are proposed in the following modules:

- Module 1. Information systems and IT manager
- Module 2. Knowledge manager
- Module 3. E-business specialist
- Module 4. Expert IT in finance.

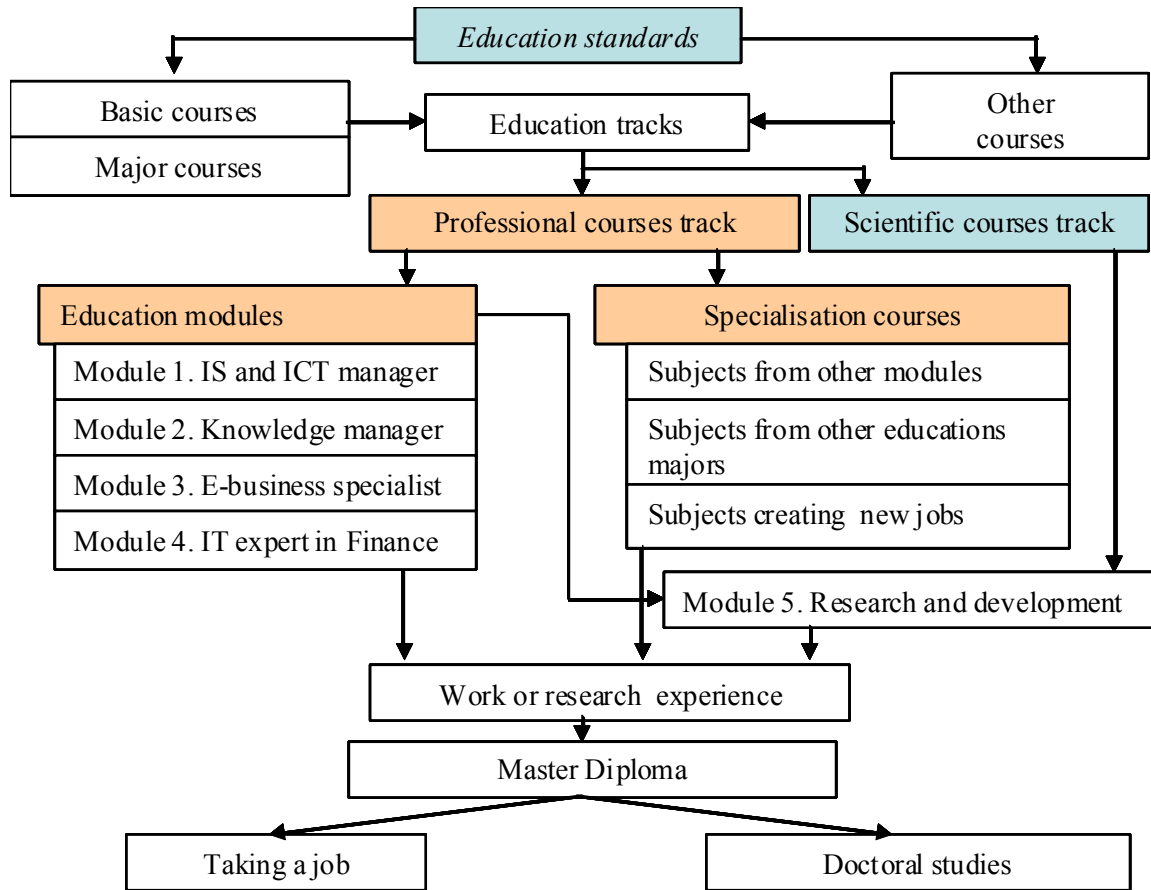


Figure 2: Program of education at the Master level

In a case of the selection of the scientific track (Module 5) a student is guided by a tutor and choice of lectures is related to research project.

Rules of the selection in the professional track are the same as at the Bachelor studies, namely 2/3 of the hours pool must be courses of the module that form particular professional specialization, while 1/3 of hours pool can be taken from additional courses.

The final stages of the Master studies are: the internship or research work, writing master thesis and passing a final exam. Completed Master studies allow starting a professional career or continuing doctoral studies.

Implementation and Program Perspectives

Presented in previous parts the project generates questions concerning constraints and real perspectives of the field of study. Development and implementation of any project is a complex undertaking where some crucial elements of university environment should be considered. The following factors have been taken into account by the project team: teaching staff, study programs, study organization, technical and computer infrastructure, promotion of the major on educational market. The mentioned elements have different impact on the goal reaching and a scope of the planned project. Short characteristics of these factors are presented below.

Teaching staff - embraces academicians with theoretical and practical background in the following scientific disciplines: management, finance, accounting,, marketing and mathematics

and business informatics applications. Staff are grouped in 5 research and teaching institutes – Institute of Business Informatics plays the leading role in the curricula.

Study programs – cover contents of many subjects of general education as well as major and specialty courses. All subjects are strictly defined at the particular levels of education bachelor and master degrees. Standards and good practices of the European programs (ACM and IEEE) are included to the project. There are job-oriented modules defined at the bachelor level and 4 modules at the master level.

Study organization – relies on teaching classes scheduling. The particular programs assures gradually delivering knowledge in the semester education. Teaching hours and a form of teaching (lectures, labs and seminar) are defined for every course with ECTS points. Work and research experiences suitable for preparing Bachelor and Master theses are planned in the study organization. Two options (professional and scientific) of the educational paths are offered at the master level.

Technical and computer infrastructure – is considered as the element of educational needs. Rooms and computer labs supplied with the necessary equipment constitutes this infrastructure. Demonstrations of the complex computer systems representing integrated software products (MRPII, ERP, SCM and BI) are essential in this education. All these products are available as a result of co-operation with leading software companies, for example: SAP Poland, SAS Institute, Oracle Poland and BPSC and Rodan System.

Promotion of the major at the educational market – consists in implementation of Business Informatics in the university. Necessary activities are performed at the institute, faculty and the university levels in the form of marketing materials, movies and brochures informing about the essence and form of studies. The major has been presented during educational fairs, in a local press and materials about BI are available at the university website. Apart of these initiatives meeting with potential students and discussions with representatives of software companies allowed on starting up this major.

Generally speaking the problem of educational quality is strictly tied with evaluation and supervising of teaching processes. Basic assumptions of these undertakings are defined in the research projects (Nowicki et al., 2010). There is a real demand on BI graduates according to our research results. Initially we offer business informatics education oriented on small and medium sized companies but in future we plan extend our program including modules prepared for bigger companies. Other initiatives that make this major more attractive refer to offering studies in English, preparing “joint degree” diplomas and implementing doctoral studies in BI with co-operation of Leipzig university.

Summing up one ought to hope that proposed field of study in the essential manner contribute to the improvement of IT education in Polish higher business education, preparing nowadays graduates needed by small and medium size enterprises and for bigger in the future.

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Biographies



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