

## INFORMATION TECHNOLOGIES STRUCTURING IN THE EDUCATION THROUGH BUSINESS PROCESSES

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This paper wants to present the possibility for IT use like a tool for educational problem solving, as well as the problems following IT implementation. Great IT features does not ensure great advantages – incorrect IT use might not only bring no benefits, but to become an expensive problem. IT management systematization requires objective needs and directions development judgment of education. Do business processes can bring value for IT managing in education?

Key words – Business Processes, Integrated Information System

### GENERAL PROBLEMS OF THE CONTEMPORARY EDUCATION IN BULGARIA

The official reports of the Bulgarian State Institutions reveal unsatisfactory level of education. There is unacceptable big difference in the level of education of the universities in European Union and universities in Bulgaria. This fact imposes the following question to be asked: What the reason for that situation is? Why education quality is lower in Bulgaria than the European Union?

The answer of that question reveals not only one but several reasons causing that situation. The general reasons could be grouped and presented by following manner:

- Organizational reasons – internal for each university, similar by character and appearance;
- Educational system – the educative program on which the students prepare themselves and are being examined, together with the teachers participating in said program;
- Control – insufficiently effective or missing control of education processes;
- Innovation policy – weak or missing innovation policy in education system.

Organizational problems general consequences of the universities reflect in:

- Each faculty and desk, as well as all other internal structures, exist as independent "islands" in frames of the university;
- The existence of different procedures and requirements for one and the same think;
- The communication between teachers and students is difficult;
- The communication between the university, by one side, and students by other side is difficult;
- The communication between teachers is bad.

Organizational problems results reflect in:

- Waste of time and resources;
- Giving much more efforts for fulfillment of all the activities;
- Unsatisfactory final results.

The above-cited problems in the Bulgarian education require the finding of adequate, effective and stable solution. Is it possible the information technologies to be used for solving the mentioned problems? Where is the limit of their abilities and does it exist other alternative decision?

### THE INFORMATION TECHNOLOGIES AS MEAN FOR EDUCATION

Wide IT entering in our work and manner of life makes IT entering into education logic– as mean for education ad as area for research. From educational point of view, on the first case IT represent a tool, and on the second one - they are subject for research and analysis.

Considered as tool for education IT give possibilities which no other instrument gives, namely:

- Interactivity;
- real adaptation;
- independent control;
- work in real time;
- possibility for visualization;
- possibilities for simulation;
- integration with other means;
- big flexibility and speed of work, etc.

It is not necessary all the possibilities to be presented in details that IT give, as well as their real applicability. IT features give possibility for new way of development methods and tools for education, as the restrictions consist of personal points of view and comprehensions. IT has another important role in the education, which is not directly obvious – organization of the activities in the process of education.

It is logic to suppose that the induction of powerful instrument in the education will stimulate its development. The possibility for constructing a virtual reality and almost the unlimited areas of applications of IT give numerous of possible directions for education development, based on IT. Said directions give many advantages – different centers, universities, teachers or students can direct their efforts in different areas, being supported by IT. As result numerous methods and tools for education, which can have wide application, have occurred.

### IT IN EDUCATION - PROBLEMS

Together with the advantages, received from the utilization of IT, the education based on IT causes and some problems. In case if there is a possibility for development of the education in many directions, than the possibility the incorrect direction for development to be chosen becomes more realistic. Is it possible means and efforts to be applied in the incorrect direction of development? Besides is it possible the speed of development in the incorrect direction to be determined as bigger than it should be, because of the catalytic action of IT? If the induction of modern means for

education, the elimination of the physical distances and the implementation of electronic forms of teaching and rating is not in fact degraded? Is there any danger, occurring from the induction of IT in education and if yes where are they? The consideration of the relation between education and IT should be made at new, scientific level, as the problem should be considered from systematic point of view.

The more-late is found that the direction of development is incorrect bigger the consequences will be. This imposes the choice of direction of the education, based on IT, to become carefully and first of all preliminary – before starting to work on the direction. Naturally the following question occurred - what direction of development should we choose? What criteria should we apply to be sure that the right direction of development will be chosen? How are we supposed to synthesize the criteria for choice of direction?

#### CHOICE OF CRITERIA FOR DEVELOPMENT IN IT AREA

It is most natural criteria for appraisal of IT in education to be searched in the criteria for organization of IT. The utilization of criteria, used in the development of IT could be useful. But is it convenient? Could we apply criteria of IT in education? IT are artificial systems, projected by humans and are predictable in their activity. But is education so predictable? In IT the external factors influence not on the algorithm of work but mostly on the physical process of work – electromagnetic, temperature, mechanic and other disturbances. We could accept that the algorithms don't change if the technique works in normal surroundings. Than the result received could be predicted. Strong formalization of the work of IT, with identical repetition of one and the same process, is presented. Are the criteria, applicable for such type of systems, also applicable for the education, based on IT? The education is a process which is strongly influenced by external factors; the identical repetition of the processes is missing and said process is strongly dependant by the "imperfect: humans. Than the criteria for appraisal and choice in one "orderly" system will not be applicable in a "disordered" system.

It is necessary other criteria for evaluation of directions for development of the education, which admit that disorganization, to be found. Than other criteria, which give possible result at their work in such systems will be obviously searched. How to find these criteria? What do they represent and how do they function? Is it possible a base for comparison to be inducted and based on the results the right direction to be chosen before starting work?

#### SYNTHESIS OF THE CRITERIA FOR DEVELOPMENT THROUGH BUSINESS PROCESSES

IT give possibility already known activities to be made by new manner, more quickly and more easily. But is the acceleration of one process sufficient? If we integrate each process with the others in this way new quality in the work, except the speed, will be available. For this purpose is necessary the different performed actions to be preliminary described, algorithm for their repetition, applicable in IT, to be made. Than the respective program security should be developed and that system should be implemented into operation. That cycle should be repeated many times, until the fully description of all activities that are in our interest. Than the integration of these activities could be started, but already in electronic state. By that way multifunctional computer system is obtained, which repeats our actions, but incomparably faster. All these things help in work but are they correct?

The description of the business activities has received wider popularity under the name business processes. The description of business processes could be made under different form, by using different models – verbal, tabular or graphical. There are different methodologies of description, including and requiring different information of the real process. But in any case these methodologies have one common purpose – enough information for the exact description of the business processes to be gathered.

Description of business processes is not made purposeless. The identification and description (molding) of business processes requires the utilization of definite logic rules. Said utilization of rules at molding guarantees that the result will correspond to preliminary given requirements. Many companies have developed software for description of business processes. The biggest software world companies are also included. The development of such programs requires preliminary logic clarification of methodology for description of business processes. This fact guarantees that results required will be achieved at description of business processes and observation of said methodology. Models received have unified results from one side and are logically satisfactory and correct from other. Description of business processes without exact methodology and obtaining good final result is less probable. Different manners for description of each individual make that task very difficult.

Once described business processes give possibility software solutions, based on them, to be developed. But is it reasonable all activities to be implemented in electronic state by this way like they are currently executed? Business processes allow this but it is not efficient. Superfluous or repeating actions are consisted in each activity. Than it is better these activities to be preliminary removed before being implemented in electronic type. Otherwise this will impede the exploitation of programs in the real life, as well as their implementation, development and maintenance. That's why the description of business processes, before developing of program security, and utilization of the methodology, necessary for this, will give the necessary clarification. Thus logically clarified business processes will be obtained, together with their relation with other described processes and resources, necessary for their normal passing. Possibility missing processes, which are necessary, to be found is important moment at description of business processes.

The result from description of business processes is important for development of software and IT because of the following reasons:

- It defines the functionality which is necessary for IT
- It synthesizes criteria for choice of IT;
- It synthesizes criteria for development of education;
- It synthesizes system for evaluation of decisions
- It gives the order for work which has to be observed;
- It reduces and ranges work during development of software.
- It exploitation costs decreases expenses on and maintenance of IT.
- Makes work easier and ordered during the software developing stage;
- Reduces IT operational and maintenance costs.

As the end result of the business process description, a complete picture of real running activities appear, real needs is establishing and real problems is discovering. That way even on the IT planning phase, key requirements to them and work way conditions are received.

On the next figures three major models for business process description are presented: organizational structure, event driven process chain and knowledge model.

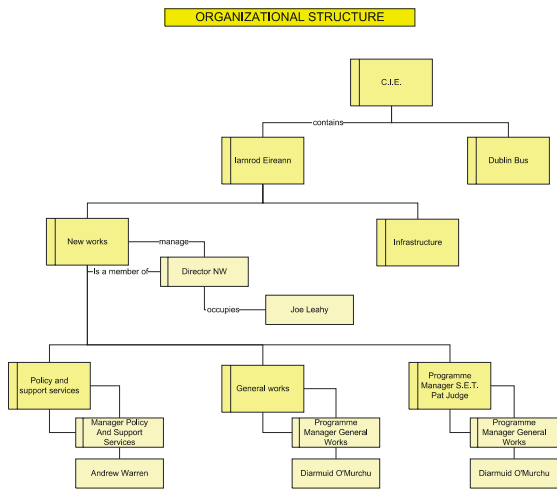


Fig.1 Modeled ORG - Organizational model



Fig.3 Knowledge Model

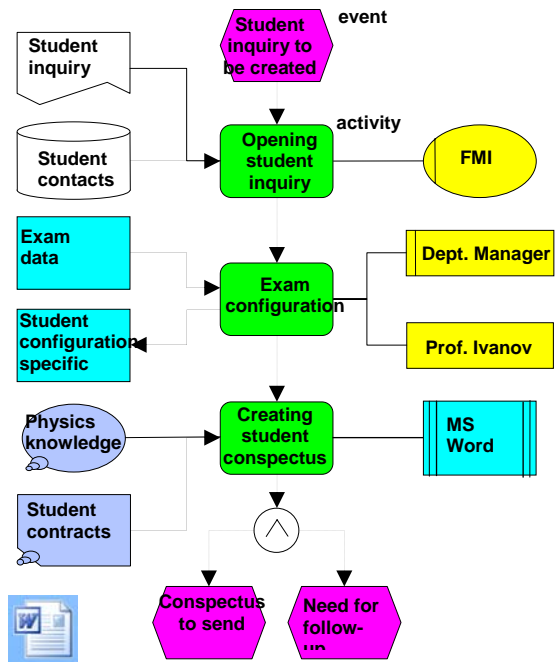


Fig.2 eEPC -extended Event-Driven Process Chain

### BUSINESS PROCESSES – IT BASED EDUCATION BASEMENT

Bulgaria has not unified education process criteria at the moment. Different schools have different criteria, different lecturers also have different criteria and different schools' management have different visions. This "diversity" of educational ways and forms influences results directly. What would happen if the present Bulgarian educational system transforms into electronic one? Obviously the present system needs a redesign because to guarantee the quality and results consistency. Additionally it has to admit technologies development dynamic. An efficient unified education methodology development, objective control and clear obligations with, are the efficient education basement. Good result achievement can not be done without IT implementation. Objective control and business process observe in education are possible only with suitable information system. IT gives the opportunity for proper business process realization and enhancing traditional education's forms possibilities. IT implementation should be done that way, because to remain "invisible". The IT sense into education is not in their work but the way how they are organized and used.

Present education needs more flexible education system than in the past. New technologies development and implementation expand the possible education processing forms and ways. It is necessary education to be adaptive, considering with incoming students education level. As well as it has to be flexible, allowing new education aspect and modernization of old ones. IT does not give way to achieve that. The organization way and transformation criteria should be given ageing trough business processes and the realization – trough IT.

Business processes in education has not been developing in Bulgaria until now. Education quality depends to a great extend from lecturers and students level. That is the reason for inconsistency results and gradually requirements fall.

## EDUCATIONAL BUSINESS PROCESS SPECIFICS

Business processes should represent the logic of the running activities. Following this, it is obvious that different industries may not have same processes. Additionally if they have same ones, details might have difference. Each industry has its own specifics, which should be mind at the design stage. Academic business processes are not exception. They have own specifics reflecting on education like a system. Some Academic business processes major specifics are:

- The incoming students' knowledge level changes constantly. It mainly depends on previous education. It is not influenced from public advertisement like the other market;
- Technologies development and their daily work entering are a strong factor for skills and knowledge formation;
- All industry is "client" of university education. That means business needs should influence and drive educational process;
- Interdisciplinary knowledge is a major issue – at least specialists should have Professional + IT knowledge.
- Educational programs should be adaptive. It demands flexible academic management;
- Lecturer knowledge should be extended constantly;
- Students' professional realization and growing feedback is required.

University education must be flexible. This flexibility requires from university education to be dynamic and conformable with the changing environment – like inputs and data and like output results and knowledge. Following the environment dynamic lecturers must be adaptive and collect new knowledge. Interdisciplinary knowledge is a major objective. Students' consumers – industry – change its requirements as well. Integrated Information System (IIS) is a must, because to track students realization, their professional progress and problems facing. Continuously results' comparing with EU universities is required. Feedback must be lead in and result analysis – from lecturers, students and student users - the business. It is necessary to be studied science and education novelty and their in time applying. Processes dynamic requires activities dynamic. The best way for work dynamic improvement is modern ICT and conceptions use.

## AN EDUCATIONAL BUSINESS PROCESSES PROJECT SCOPE. SIMULATIONS.

The major directions for business processes description in education are two – education activities and all other activities. The business processes into education activities should regard the whole education process – material presentation, the way of activities performance, the way of exam performance, result assessment and so on.

The activities which are not connected directly to the learning process might be classified as organizational. Here are included the documents, plans preparation, schedules and activities preparations, services and maintenance e.g. Accountant activities are also included, but from an organizational point of view rather than financial. For normal educational process performance it is necessary all supporting activities to be planned and executed well.

For educational process normal running it is necessary all supporting activities to be planned and performed very well. Business processes scope can begins with students gathering for instance. Applications collecting campaign should be organized proper way. Next processes that have to be developed are applications processing and exam

preparations. Students' acceptance should finish when all students are accepted – lists are completed.

Next business processes description stage includes educational work processes, their organization and documents pursue. It must be clear what documents at what stage are needed, where they can be obtained, how should be field up, where have to be transmit, dead lines, who has to perform processing e.g. When whole activities and documents relations are clear this stage finishes with the final possible mark field up.

Lecturer's recruitment and release are universities' major processes. Seminars, conferences and projects participation and organization are major processes as well. These are not daily events, but periodically. Some of them might be single. All of them have to be described by business processes also, with clear initial conditions and end result.

According to methodology when business processes are correctly described, the possibility to make simulations it appears. Simulating impossible future situations, education system behavior and its features can be improved before real problems become a reality.

## CONCLUSION

Today's IT make distances insignificant. Dynamic life needs to be implemented new educational forms, according to realities. New individual education methods implementation adapted to students will allow better results achievement. That should be new education quality. If we unify all education development directions, requirements and opportunities in a single product, that would be real e-learning. Classical educational model is required, that allows to be transformed to e-learning. New e-learning features should be taken in mind. E-learning does not mean e-documents. All ideas for e-learning and classical education renovation are completely impossible if IT are not organized and used proper way. E-learning, based on IT is a complex of activities analogous to classical learning, but new technologies enriched.

- E-Learning should be able to share knowledge remotely;
- E-Learning should represent at least the normal academic education;
- E-learning should have resources, rules and performance requirements;
- E-Learning should be adaptive according to personal students' knowledge and skills.

## References:

Some understandings, terminology and pictures are used from ARIS software.

- [1] Radkov, I.B.: Management – Science and Practice, Sofia 2002, ISBN – 954-91218-1-X
- [2] Delors, Jacques and others – „Education – a hidden treasure”, UNESCO, 1996
- [3] Leslie Willcocks, David Feeny, Gred Islei - Manging IT as a strategic resource, 1997
- [4] McGraw-Hill - Business Process Improvement Workbook, 1997, ISBN: 0070267790
- [5] Sams - Business Process Management, 2001, ISBN: 0672320630
- [6] Scheer A., ARIS – Business Process Modeling, Springer, 2000
- [7] Morgan Kaufmann - Business Process Change, 2002, ISBN: 1558607587