Reengineering Process of Higher Education Using E-learning

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Abstract: - Education alone can not solve all problems of the contemporary world and the organization, but can not conceive any sound and sustainable solution to the serious current problems without the contribution of education systems. The reengineering process of higher education will include the nature of learning experiences, the instructional system that implements those learning experiences, the administrative system that support the instructional system, and the governance system that governs the whole educational system. E-learning systems are mostly used together with face-to-face learning, but they may be applied to distance learning after some adaptation. Distance learning has proven to be useful in tertiary education, universities, and in environments which need their learners to be lifelong learners.

Key-Words: - reengineering, education system, e-learning

1 Introduction
In view of Michael Hammer and James Champy, reengineering actually means "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements indicators, considered critical in today's performance evaluation, such as cost, quality, service and speed. [2]. The four key words of this definition are: fundamental, radical, dramatic and processes. Reengineering means to reverse the industrial revolution, abandoning assumptions inherent in the industrial paradigm of Adam Smith - division of labor, mass production advantage, hierarchical control and all other parts of the economy in a primary stage of development. The business reengineering lays the notion of discontinuous thinking - identifying and abandoning the outdated rules and fundamental assumptions underlying business operations today. These rules are based on assumptions regarding technology, people and organizational objectives, which today is no longer valid. While companies will not change these rules, any surface reorganization will be ineffective. There are three forces acting separately and in conjunction, push companies today in an area that managers feel is very unfamiliar. These forces, called CCC: Customers, Competition and Change, created a new world of business and it appears that organizations designed to operate in an environment can not be "given" to work well in another. Companies created to thrive in conditions of mass production, stability and growth can not be granted to succeed in a world where customers, competition and changing demand flexibility and fast response. While the process described in this definition may apply to business organizations such as, say, manufacturers of electric Toasters or cold cereal, business reengineering application to higher education is not clear.

2 The modern education’s problems
Education is one of the factors able to help create a better society. Responses education lies on two fronts: one of the expansion area and content of education and another set of innovations in design and conduct educational processes. If the first case requires a thorough preparation of educational processes in the latter case it must rethink the problem of the education process, in terms of orientation, sizing, tooling content elements, to integrate the young generation in society through their profession. Thinking to modern business requirements, concerns for sustainable development can offer its "New Education - parallel education" which is the most relevant and useful response to the imperatives of educational systems issues arising from the contemporary world. New parallel education, meet the requirements of contemporary issues of modern management:
• Environmental education;
• Communication Education;
• Education to change the organization;
• Nutrition education;
• Economic Education;
2.1 Distance learning
While distance learning primarily refers to remote computer-enhanced education, it is currently extending to emerging technologies, such as mobile computing and Personal Digital Assistants (PDAs). Distance learning includes the use of web-based technologies, including blogs, polls (electronic voting systems), simulations, games, and wikis. Contents of distance E-learning range from technical and medical knowledge to soft skills, such as social behavior. Even the instruction of hands-on practical work can be assisted by distance learning units. Distance E-learning has to serve very different learner groups. There are novice learners, intermediate and advanced up to experienced students. Furthermore, distance E-learning courses can be attended by dependent or independent learners who study full-time or part-time. Distance E-learning is based on prerequisites, such as management, culture, and IT [3]. Distance E-learning can be presented in many forms (Table 1).

<table>
<thead>
<tr>
<th>Form</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Based Training (CBT)</td>
<td>Students learn by executing special training programs on a computer</td>
</tr>
<tr>
<td>Web Based Training (WBT)</td>
<td>Students learn by executing special training programs on a computer via the Internet</td>
</tr>
<tr>
<td>Blended Learning</td>
<td>Provision or use of resources which combine e-learning (electronic) or m-learning (mobile) with other educational resources</td>
</tr>
<tr>
<td>Virtual Classroom, Lab</td>
<td>Students study at home and use webcams in a virtual class</td>
</tr>
<tr>
<td>Digital Learning Games</td>
<td>Computer games with an educational background</td>
</tr>
</tbody>
</table>

Table 1. Different forms of distance e-learning

All of these forms can be enhanced by multimedia content, which is designed to suit for various types of learners. Such multimedia materials can consist of: e-books; e-libraries, where we can borrow books online and check availability of books; streaming videos or audio files, where details and information are kept in multimedia files or sound and can be accessed via the Internet. The representation of the main actors in e-learning is shown in Fig. 1.

3 Reengineering in Higher Education Systems
Education process reengineering achieve the three areas of education:
- Formal education, that education is institutionalized, hierarchically structured, chronologically graded, organized and led by a specialized institution.
- Informal Education is a process that lasts a lifetime, by which every person acquires knowledge, exhortation, skills and understanding of daily experiences.
- Non-formal education is any organized activity systematically created outside the formal system and offer selected types of learning within the internal enterprise. This includes distance learning, e-learning etc. The key factors involved in reengineering process of higher education are: universities management, administrative staff, faculty members and students. Their reengineering activity is presented below:

A) Universities Management
- Department’s management has conducted an analysis of teaching activities of its members;
- Faculty and university management has conducted an analysis of teaching activities of its members, by study years and disciplines;
- Configurable statistical reports (for external factors);
- Audit complex system of system’s data;

B) Administrative staff
- Secretariats can not change / enter notes. Notes are entered once by faculty members;
- A redundant copy of scores, made by hand in four locations information, has disappeared;
- Students’ Registry, Synoptic notes, Diploma and Diploma Supplement will be listed directly in the system;
- The scoring system is configurable - you can use both traditional grades 1-10, and scores;
• Web publishing educational plans is made directly from the database;
• Schedule appointments and tests are available on the web;
• Results of examinations is reflected in a very short time on the students’ homepage;
• View on the homepage of the students of their financial status;

C) Faculty members
• Have access to the students’ groups
• Can view their own schedules and others teacher of all ESA
• Can introduce and exams’ results and list the catalog
• Can view an analyze the results of their own study formations

D) Students
• Students „maintain” themselves their personal data;
• Students choose their optional subjects matters using the personal page;
• Students choose from their personal the exams they need repeat;

3.1 Reengineering in the context of e learning
In the context of e-Learning, it is common understanding, that higher education organization must reengineer itself in order to meet new challenges and requirements. Reengineering can be applied both to a complete system and to the individual components, simultaneously in the appropriate level of abstraction. In Table 2, I presented a matrix which shows the correlation between the e-Learning process and higher education system main factors. The typical layers for e-Learning system from the lecturer perspective are also presented in Table 2. Reengineering processes, based on these layers, can be conducted by the designed persons in organization.

3.2 Reengineering of Learning Units
The base, on which distance study course for formal studies is developed, consists of the following elements: a) Objectives; b) Teaching/learning methods; c) Evaluation methods. This decomposition is made on the higher abstraction level. On the technological level the course can be analyzed as the collection of learning objects and information objects, which are aggregated into lessons, topics, sections or modules as learning units which must be reengineered.

| Table 2. The correlation between the e-Learning process and higher education system factors |
|-----------------------------------------------|----------------|----------------|----------------|
| Layers of e-learning                          | Higher education system factors |
|                                              | Management | Administrative | Faculty | Total |
| Technological layer                           |            |                |         | points |
| Hardware, software, networks, etc.,          | X          | X              | -       | 2     |
| Management layer                             |            |                |         |       |
| Policies, strategies, principles, guidelines, regulations, documents, distance study models | X          | X              | -       | 2     |
| Methodological layer                         |            |                |         |       |
| Subject teaching and distance studies methodic| X          | X              | X       | 3     |
| Subject domain layer                         |            |                |         |       |
| Objectives, teaching/learning methods (both resources and activities), evaluation methods | -          | -              | X       | 1     |
| TOTAL                                        | 3          | 3              | 2       | 8     |

The Learning Unit (LU) is an abstract term used to refer to any delimited piece of education or training, such as a course, a module, a lesson, a seminar, etc. From the lecturer perspective, there can be mainly differentiated two types of LU according to the level of granularity: overall distance study course and topic.
3) For different study programs, where the different aspects of the same subject must be emphasized. Usually the copy of distance study course is made and further modified in order to meet new requirements. However, it requires a big amount of workload time each time when new teaching/learning session starts. There are two other alternatives besides reengineering of LU:

1) Design/Development of new LU. This way must be chosen, when LU essentially differs from the previous instance.
2) Increasing support by administrative staff. Distance studies are oriented towards and based on active participation of learners, who take control over learning results. However, extra contribution by faculty members to teaching/learning process can reduce negative impact of pure learning material. Therefore, this way is suitable for immediate and one-time delivery of distance study course. The solution must be chosen carefully, because it influences further expenditures of finances, time, etc. Also it impact on further possibilities to reuse the LU. The second important step is selection of reengineering level, which is presented in Table 3.

### Table 3. Reengineering levels of Learning Units

<table>
<thead>
<tr>
<th>Reengineering levels</th>
<th>Types of change</th>
<th>Deals with:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual</td>
<td>Re-think</td>
<td>The background for reengineering;</td>
</tr>
<tr>
<td>Requirements</td>
<td>Re-specify</td>
<td>Requirements of a module (lesson), or aims and provided knowledge, abilities and competencies. Requirements of an educational organization.</td>
</tr>
<tr>
<td>Design</td>
<td>Re-design</td>
<td>Learning activities; Assessment types, or evaluation procedure of students’ knowledge and abilities; Informational, site navigation, presentational structure; Pedagogical scenarios.</td>
</tr>
<tr>
<td>Implementation</td>
<td>Re-code</td>
<td>Learning resources, activities, exercises, scenarios.</td>
</tr>
</tbody>
</table>

Higher levels influence lower levels, and, for e.g., if we have raised new requirements, we must also reconsider design and implementation. After the reengineering process has been made, e-learning courseware should provide the learners with:

1. accurate appropriately organized and clearly expressed content in order to facilitate the expected learning;
2. navigational tools to facilitate smooth progress and effective management of learning;
3. well-designed learning activities, such as clearly expressed objectives and content, appropriate learning methods and strategies, and adequately designed practice, feedback and assessment, to facilitate learning interaction, comprehension and elaboration;
4. well-designed instructional media to facilitate learning comprehension and sustain motivation for learning.

### 3.3 Reengineering process of higher education is based on quality assurance

Quality-assurance claims that come from education providers alone are subjective and questionable at best. Therefore, objective, professional quality assurance through a quality mark and objective professional quality certification provides for a win-win-win scenario. Students win with credible, consumer-oriented information to help them make informed choices. E-learning providers win with objective evidence to enhance their reputation and create competitive advantage, the consumer quality mark. The e-learning enterprise wins with substantial effort directed at quality, return on investment and, ultimately, sustainability. These are all issues that support the implementation of informed choice and consumer pressure for assured quality. In a world where there are increasing numbers of dedicated online learning providers, it is essential to provide consumer protection and consumer confidence in both online and on-site learning. Table 4 outlines Quality Criteria for e-learning elements within Reengineering Process.
3.4 Quantitative and qualitative evaluation of the teaching-learning processes

Quantitative and qualitative evaluation can be used in various areas of the teaching-learning process and learning environment. Examples are:

- Course content (relevancy, organization of the materials, adequate body of knowledge);
- Class formats (effectiveness of the lectures, appropriateness of the lab assignments);
- Use of technology (attitudes towards technology, familiarity with technology);
- Class atmosphere (conduciveness to student learning);
- Assignments (adequate level of difficulty, usefulness, timeliness of feedback, time required for finishing);
- Tests (frequency, relevancy, sufficient review, difficulty, feedback);
- Support services (facilitator, technology, library services, instructor availability);
- Student achievement (adequacy, appropriateness, timeliness, student involvement);
- Student attitude (attendance, assignments submitted, class participation);
- Instructor (contribution as discussion leader, effectiveness, organization, preparation, enthusiasm, openness to student views).

4 Conclusion

Aiming to develop all the perfections of the individual, education is a constitutive dimension of human being.
The issue of education tends to become a priority issue and all those who can see clearly the human being evolution, the rational being and humanity as a whole lies in the education center. Process-oriented education as being spiritual fulfillment and community, offers a practical way, implies participation, experience, communication between concrete individuals, in-depth understanding of developments today.

To assure the quality of learning and to provide measures for learning accreditation, learning structures and scheme including basic learning materials are usually being provided. Other sources of learning are identified and learners are free to choose whichever sources are accessible. These sources are to include human, environment, hardware, software, tools and techniques, and different form of printed materials. Distance Learning is essentially the separation between the instructors and the learners. This is achieved by various means, mainly the use of print, but other media and the new-technologies such as radio, television, audio and video cassettes, CD-ROM, VCD, interactive tutorials, computer mediated interactions, and so on. Essential elements are cases of access, specially prepared materials and student support, usually achieved through face-to-face interactions. The frequency of these interactions will depend on level, age of the students, access, need, and the availability of tutors. Where it is available, student support can be enhanced through telephone, two-way radio, e-mail and the internet.

If we are to reengineer our universities, what jobs, organization structures, and management systems do we radically change? What are the critical performance measures that will dramatically improve? To answer these questions, it may help us to consider that the "business system" is a similar model of a "higher education system." In today's world, belonging to customers, competition and change to get organized on separate operations is exceeded. Companies and universities must organize their work based processes.

References: