EPR and its Effectiveness in Higher Education

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Abstract: The recent transformations of higher education system in Indian context, concerns the thinking modern business requirements and sustainable development. Since, many higher educational institutions are employing novel techniques and tools from business sector to meet the requirements of modern management with the aim of mirroring academia to industry. The thought of Re-engineering in education consists of instructional systems with learning experiences as well as governance and support systems. The existing concept of Business Process Re-engineering (BPR) is being practiced as a successful tool in many business organizations with periodical processes evaluation from supplier to customer, and restructuring systems. The Companies use BPR to reduce costs, cycle time and to improve total quality and customer satisfaction. This paper explores the use of adopting BPR into Higher Educational Institutions as a novel approach, to look after functionalities in each process, and named it as Education Process Re-engineering (EPR). And the purpose depends on expectations and focuses on the end user adeptness and gain competitive advantage. Because Career Vision of the student before embarking on higher education may be different from what a student achieves after the course. This paper also showcases the various metrics which are created and evaluated for academic purposes to enhance the quality of teaching –learning pedagogy.

Keywords: Reengineering, Process design, functions and metrics

I. INTRODUCTION

In India, extensions in existing Higher Education sources has created essential need to improve efficiency in services with huge flexibility in the programmes offered to face numerous challenges and pressures by the external sources. This can especially perceive in the Engineering education with frequently increasing institutions and lack of potential candidates from the intermediate education. Rising enrollments are giving the experience of high competition for available opportunities. In this scenario, it is essential to rethink and reinvent required systems as a part of Re-engineering Process. Re-engineering emerged as a discipline in the 1980's to fulfill the Industry gaps. Business Process Reengineering is "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical and contemporary measures of performance, such as cost, quality, service, and speed."[1] Many US IT companies attempted Business Process Re-engineering (BPR) for linking business processes across the functional boundaries during 1993.

In Education sector, a thought about reengineering in higher education is a vital part of difficulty which a lack of clear analogs among Universities – Institutions – Industries as a whole. The performance of higher education is of great significance for the competitiveness of nations.[2] In 1992 re-engineering viewed as a suitable means for ensuring Higher Education Institutions adapt to the changing demands being placed upon them.[3] But, many academicians would argue that academic process is of a fundamentally different order from business process. For this reason, James Porter in his research during 1994 concludes that reengineering should be applied on major administrative process and support services rather than teaching and learning process. In common with other business organizations, a number of strong interest groups of Higher Education Institutions are achieving change as a multipart mission. Although, reaching agreement on how to redesign the processes is likely to be challenging.

The applicability of BPR is particularly concentrating on how this project and the team can

success in evaluation and restructuring educational processes with transforming framework. Therefore, achieving excellence for process reengineering as a change management strategy in Higher Education Institutions especially in Engineering Institutions are utmost importance is highly significant exercise

II. REENGINEERING AREAS IN HIGHER EDUCATION

Extending reengineering to higher education have certain parameters considering the slow changing process in the Country shows as periodical curriculum updates, new technologies, electronic media, publications, etc. These can be utilized after careful reengineer process to create the effectiveness on the basic assumptions, like the lecture hall, library, tutorial, and the laboratory remains the structural constants of college and university education [4].

A. Important Parameters for reengineering framework:

The above assumptions forced to rethink teaching and learning, which affects the roles and responsibilities of student and the instructor. Meanwhile support process, academic calendars and the structure of delivery of curriculum need to be thinking towards reengineering process. In connection with framework design and closer to the organizational culture of Higher Education, and prior to the Hammer and Champy work, Reference [3] argued “by using BPR in Education sector and utilizing the power of modern information technology to radically redesign administrative processes in order to achieve dramatic improvements in their performance”[4]. From this conclusion, it is to understand that the ultimate goal of process reengineering is to achieve efficiency and effectives on existing processes where as the goal of total quality management is to undertake process change gradually by working in incremental steps[5]. (O’Neill & Sohal, 1999). The major parameters of contemporary issues on higher education play an important role on improvement of efficiency in services are as follows:

- Governance of the Institute
- Embedded Infrastructure facilities
- Qualified and experienced faculty with quality publications.
- Established Research Eco-system
- Funded projects from statutory and reputed organizations
- Multidisciplinary research projects by students and staff
- Well-established Incubation Centers

- Creating Ideal competitive environment among students with various activities
- Continuous Faculty training programs on Active / Engaged Teaching methods.

B. Outcomes of frameworks of EPR from existing literature:

The work established on 2008 October by M’hammed Abdous and Wu He from Old Dominion University, USA, argued that from the BPR perspective the existing frameworks inspired by two main sources. First is a retrospective analysis of our own experience in reengineering several internal processes, such as faculty development program management, a syllabus creation process, and learning assessment lab registration. And the Second is the BPR literature.[5]

Table:1- Key function of framework (Source: M’hammed Abdous and Wu He from Old Dominion University, USA, October, 2008)

<table>
<thead>
<tr>
<th>Key Functions</th>
<th>Organization Culture</th>
<th>Leadershi p</th>
<th>Information Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiative</td>
<td>1.1.Identify the processes to be reengineered</td>
<td>1.2 Understand process environme nt</td>
<td>1.3 Document process to be reengineere d</td>
</tr>
<tr>
<td>Analyze</td>
<td>2.1. Analyze the process environment</td>
<td>2.2 Flow Chart existing process</td>
<td>2.3 Identify Strengths &amp; Weaknesses</td>
</tr>
<tr>
<td>Reengine er</td>
<td>3.1 Reengineer Existing process</td>
<td>3.2 Flow Chart reengineered process</td>
<td>3.3 Communicate &amp; gather feedback</td>
</tr>
<tr>
<td>Impleme nt &amp; Evaluate</td>
<td>4.1 Prototype reengineered process</td>
<td>4.2 Implement Reengineeri ng process</td>
<td>4.3 Evaluate &amp; Report Achieveme nts</td>
</tr>
</tbody>
</table>

From the above table of Process Reengineering framework the Key functions of Organizational culture aims at understanding environmental dynamics & politics, the leadership function aims at clear vision, support, involvement & capacity for action whereas Information Technology focused on enabling dynamic and scalable tool.

Table:2 – Summary of key points in Process reengineering framework:

<table>
<thead>
<tr>
<th>Reengineering levels</th>
<th>Types of change</th>
<th>Deal with</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual</td>
<td>Re-think</td>
<td>The background for reengineering</td>
</tr>
</tbody>
</table>
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 scenario. Students win with credible, consumer-oriented information to help them make informed choices. The educational system is not primarily a question of using technological tools but the process requires that faculty members regard traditional methods and technological tools as a set of resources to be interrogated, not taken for granted. Each tool or method has appropriate uses and scalable implementations which are not fixed. Considering all the above arguments the following factors require rethink the present status in the Institute before starting the EPR Process:

- Curriculum relates to latest scientific and technological changes
- Effective pedagogy implications
- Achievement at Institute level and human level
- Competent faculty and adequate resources
- Proper functioning and continuous improvement policies framing

### III. DESIGN OF FUNCTIONS AND METRICS

In the context of designing functions & metrics closer to the organizational culture of Higher Education, reference[3] identified a functional process reengineering for education stream as “using the power of modern information technology to radically redesign administrative business processes in order to achieve dramatic improvements in their academic performance”. It means a dramatic change which is the overhaul of organizational structures, Management Systems, Employee Responsibilities and performance measurements, Incentive systems, skills development and the use of information technology. Virtually all educational Institutions, Programs, and Courses will benefit from some degree of re-engineering for the future preparation. From these two definitions, the ultimate goal of process reengineering is to achieve efficiency and effectiveness by radically rethinking existing processes; whereas the goal of total quality management is to undertake process change gradually by working in incremental steps[5]. A successful Re-engineering in the institute begins with student credit hour, faculty load, course studying, student-faculty interaction, student evaluation process, etc. Identification of major functions depends on the administrative structure and policy with procedures. For any higher educational institution, foremost function starts with ‘academics’ followed by research background. The strong foundation of research becomes the base of good innovation which can help the student to make success of his ideas and efforts along with classroom learning. When learning from classrooms, laboratories and library leads to research interest, ideal innovation can takes part for young entrepreneurship. So, from the following diagram the common prime functions along with sub-functions and its metrics for EPR have identified for implementation in the institutes.

Figure:1-A Functional process of EPR in Higher Education Institute

C. Phase:1-Evaluation of Academics

The graduates producing from many institutions are not equipped with appropriate skills desired by industry and other sectors. The major concentration on skills improvement from traditional system which interpreted narrowing as working with hands knowledge based. The technical developments giving the share to education sector for content development, curriculum design & delivery systems. The foremost steps for academic excellence include authenticity, credibility, expectancy and competency supports to build the systems.
Policy: To build excellence in the educational system to meet the knowledge challenges of the 21st century and increase the Institute competitive advantage in fields of knowledge. Goals and objectives are as follows:

1. Provide high quality education and nurture the careers of excellence & leadership in Science and technology.
2. Establish and support spires of Excellence in programs and research.
3. Engage faculty to lead development of plans to build distinction in each selected field.
4. Successfully develop academic programs that provide meaningful and distinctive educational experiences.
   • Launching of new courses
   • Enhancement of curricula to provide more integrated, thematic, up-to-date programs that reflect the brand identity
   • Improve learning outcomes through enhanced pedagogy and delivery methods, including integration of technologies.
5. Replicate academic achievement across the branches regardless of their unique challenges through Seminars / conferences & variety of outreach programs.

Metrics: The specific, quantitative metrics to achieve academic excellence are as follows:

• The 95% Rate for Academic Excellence
• 100% graduation rate in four years
• 95% passing rate of National Professional Examinations
• 95% evaluation rate of faculty with a grade of 4.0 or higher as assessed by students & Department Heads.

**Table 3: Academic Excellence-Challenges and Opportunities:**

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best practices</td>
<td>Decentralization – responsibility – accountability</td>
</tr>
<tr>
<td>Human resources / Faculty</td>
<td>Empowerment of Faculty and students</td>
</tr>
<tr>
<td>Infrastructure - state of art</td>
<td>Create cell : TPC, IQA, EDC, Industry- Institution – Interaction , R and D, Consultancy and sponsored project</td>
</tr>
<tr>
<td>Employable students</td>
<td>Developing a core competence and specializations</td>
</tr>
<tr>
<td>Research – Consultancy – IPR</td>
<td>Skill development for industry</td>
</tr>
<tr>
<td>Research Projects</td>
<td></td>
</tr>
</tbody>
</table>

D. Phase:2 - Research Exposure:

The main Goal towards Research is “Identifying the synergic aspects of Education and Research, in order to stimulate their development into engineering institutes. Active participation by Institute staff Undergraduate students’ exploration, curiosity, get prepared Graduate students: Involvement of students in research”

The institute should believe in training the students beyond the prescribed curriculum and syllabus. It is aimed to provide an industrial environment for both faculty and students interested in the Research and development of products use the Industry. The established Research & Development Centre with well equipped advanced level research Laboratories to facilitate the students and staff to carry out the Projects is necessary.

Objective: The institute Research Policy must include all the diverse disciplines of engineering and basic sciences. Institute encourages its researchers to involve in a wide range of National, International and Industrial research on collaborations and also with National CSIT Laboratories.

The Institute which creates unique opportunities for conducting and supporting Research in Cross Domain multi-disciplinary areas, it helps to encourage the faculty for active involvement in research and consultancy work beside their regular academic activities.

The Institute should addresses and enhances students’ imagination, initiative and practical skills and equips them to innovate and confidently cross the threshold of challenges. They involve, even as students, in creating innovative designs, products and services that directly or indirectly enhance the quality of lives.

E. Phase:3 - Innovation & Entrepreneurship:

The Objective of Innovation & Incubation centre is to provide meaningful education, to conduct original research of the highest standard and to provide leadership in technological innovation for the industrial growth of the country.

The focus is on:

• Basic research from micro to macro levels involving various process and products.
• Providing leadership in Energy Technologies, Communication Systems, Materials, and Environmental Engineering.
• Enhancing collaborative research with academic institutes, industry and R&D organizations.
• Reengineering Entrepreneurship.
The role of innovation in the development of entrepreneurship: Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. It is capable of being presented as a discipline, capable of being learned, capable of being practiced. Entrepreneurs need to make purposeful search for sources of innovation, changes and their symptoms that indicate opportunities for successful innovation. The Institute is applying the principles of successful innovation.

F. Phase:4 - All-round Personality Development:
The initiate for the developing of all round personality of the students by providing motivation and designing development programmes by central units should properly established to develop all round personality of the students. Personality development helps a student to achieve the responsible position with best choices and always to be the best talent pool on key competencies acknowledged by the Industry. Always reverberating of activities make students to convert Challenges as Opportunities and withstand as a Global Leader.

IV. CONCLUSION & FUTURE EXPANSION
The objective of Re-engineering is to enhance both the effectiveness and the efficiency of activities and a systematic process of analysis, design, and implementation. In conclusion, for the successful implementation of EPR in Management level, Institute level, Department level with evaluated frame work of existing activities a team of experts need to form with required resources. Quality assurance is the bottom level impact of all activities and it depends on metrics formed by objectives in each process. From the implementing framework, with identified metrics require continuous evaluation and updates accordingly can frame new metrics. The layers can be added on the prime functions of Academic Excellence, Research Exposure, Innovation and Entrepreneurship for the Development of all round personality of a student through Higher Education.

V. REFERENCES