Reengineering higher education- can it be done?

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Abstract

Higher education is rapidly going through major changes. These changes are evident in almost every aspect of its activity, from enrollment thorough graduation rates, from budget cuts to public demands for more transparency and more accountability, from students' demands to marketing, and more. These fast-occurring changes produce pressures on the institutions of higher education to adapt to them. These pressures are coming both from inside higher education and from the outside. They are local pressures, on specific institutions and more comprehensive pressures, on the whole system of higher education. Since the pressures carry with them the risk of having profound impact on the institutions, the institutions are trying to adapt to them as well as possible. Organizational improvement approaches vary in scope, and offer a variety of effects and risks. Reengineering, an approach made famous in 1993 in a seminal book by Hammer and Champy, is one of the most daring and far-reaching improvement methodology, one that carries with it the potential of great rewards but also of grave risks. Consequently, it is used less frequently than other improvement approaches or organizational change methods. Yet, when major changes seem inevitable, it is an approach that merits serious consideration. Higher education, generally, is quite conservative and change-resistant. Therefore, it is not surprising that reengineering attempts are not commonly tried, at least not on the academic side. Recently, this seems to be changing, as more authors advocate its use on higher education institutions. The critical question now is whether this approach can succeed in higher education, on its academic operations. The authors who advocate using this approach think it is worthwhile undertaking. That is probably true for individual institutions – if done right, with the proper planning, with the absolutely critical top management strong and unyielding support, and with the right budget. The question this paper raises is the macro-level question: can we reengineer the higher education industry? Can we, as a society, reshape this important human activity so it can withstand the external and internal pressures being brought to bear on it, and still deliver the great service it has delivered for a millennium? This paper addresses these issues and tries to provide an answer.

Keywords
reengineering; higher education; disruption; risk; improvement approaches

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1. Introduction

There is no question that higher education is in the midst of a very difficult period. Many authors – too many to even list here – have noticed it. Many leaders of academia have addressed this crisis and most have tried to offer one type of remedy or another. However, the leading themes in those proposed solutions are usually centered around adjustments, modifications, and generally around fairly minor changes. There are those that foresee the potential of disruption coming from outside academia (this author included). Most everyone agrees that vast improvements are required, but there seems to be no consensus about what shape form or content, precisely, those changes should include.

It is this author's contention that minor, small improvements – while definitely desirable and welcome – are insufficient to alter the course of higher education. What is needed is reengineering of the higher education system. Reengineering, a term made famous by Hammer and Champy (1993) that addressed businesses, involves radical changes. A graphic depiction of the various options of improvements initiatives available to organizations is given in Figure 1. Reengineering is not a process that is free of risks – none of the options is risk-free, of course, and reengineering's risks are considerably higher than some other improvement alternatives, but, in some cases, it is the only solution available. This is the case for higher education today.
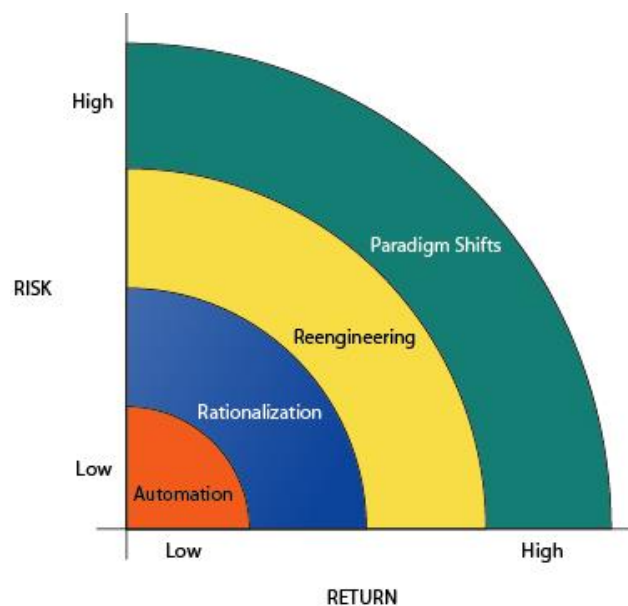

Figure 1 – Return vs Risk of Improvement Approaches

Given the high risk involved, it is questionable whether the captains of higher education will try it and whether – if they do – they will have the support necessary for carrying it out.

In the next section, a brief description of the various improvement approaches will be given. The following section, will present a review of the literature of reengineering efforts in higher education. Section four will discuss the reasons for reengineering higher education, and section five contains a discussion of the success chances of such undertakings. The concluding section presents a summary of the paper.

2. Improvement Approaches

Improvement approaches are quite numerous: automation; rationalizations; downsizing; efficiency measures; reengineering; constraints removal; outsourcing; paradigm shifts, and many more. For brevity's sake, this section will only discuss some measures and approaches – those that have gained widespread applications and are represented in the diagram above.

2.1 Automation

Automation is the process of relegating an activity, or a series of activities, to a computerized system. This process normally just replaces the manual system and does not involve any major improvements, or even minor improvements, and simply changes the human work into computerized one. The main benefits of this improvement are increased accuracy, decreased need for human labor, higher speed of operations and higher availability. As far as the intrinsic logic, sequence of operations, inputs and outputs, the computerized system does not change much. The benefits listed above are usually sufficient to justify the investments necessary for the transformation. Competitive pressures, from competitors presenting a more advanced façade, also contribute to the incentive to automate labor intensive, repetitive actions. Regulatory requirements may also mandate such automation. Overall, this improvement approach provides, for the most part, a modest return on investment and a fairly low risk level.

The risk level is low because the system, basically, does not introduce many changes to the *Modus Operandi* of the service being automated, so implementation is rapid, adjustments are minor (with the exception of changes in labor that may be substantial), and retraining is minimal.

2.2 Rationalization

The rationalization approach presents an improvement over simple automation. Management decides that, while it is setting about to automate a process, system or service, it will take advantage of the imminent change and rationalize the process progression in the organization or the service's procedures and routines. This is done by the planning and design teams that not only look for ways to automate the process – but also seek ways to reduce waste, eliminate steps that had been rendered unnecessary due to changes coming sources: technical advances; legal requirements; environmental influences; marketing considerations; financial constraints; strategic decisions, and more. Management hopes that the new system will present a more comprehensive solution, streamlined and optimized, a solution that will provide the required services more efficiently and with lower operating costs, and will thus improve the business's or the organization's results.

The risk level of this approach is higher than that of simple automation mainly because it essentially tries to accomplish two types of improvements at once: automation and a new way of doing things. That means that there will be bigger adjustments to work routines; implementation will be slower than that of simple automation due to increased need to retrain the relevant workforce; objections may also run stronger; schedules will be longer; expenses will be higher. That said, many organizations take this approach since they believe that when the organization decides to launch a project that introduces automation of a given process, it must use this opportunity to weed out bugs in form the old system and improve the way it functions and not settle for a simple, plain replacement of manual labor with computers.

2.3 Reengineering

Reengineering is a far more radical improvement approach, and it therefore also carries a much higher risk. The leading idea behind this approach can be phrased as follows "Build a

completely new system, from scratch, using today's (or even tomorrow's) requirements and today's technologies and capabilities". This is a simple enough statement, that carries with it a very powerful message: Disregard everything that was done till now, and build a new system to satisfy the needs and requirements as they exist today and as they foresee the future. Disregard legacy systems, solutions and procedures – and create new ones with the knowhow, the tools and the technology available today.

Prima Facie, it looks simple and straight forward: just throw away the old, and bring in the new. In a theoretical perfect world, this could (or perhaps would) be acceptable. Of course, discarding an existing system is never easy for all the obvious reasons: habits; emotional attachment (of the developers and the users); financial ramifications (depreciation, scrap values, etc.); organizational culture; general organizational resistance to change; organizational politics; manpower ramifications, and more. In addition, there are other risks involved: untested technology (overall or in the organization); uncertain outcomes; retraining costs; personnel changes; customer reactions; ripple effects on other systems; development costs, and many more.

As a result, reengineering is considered a high-risk improvement approach, and most organizations tend to choose other, less drastic approaches. When reengineering succeeds, it can produce outstanding results and improve the organization's performance, but the high risks involved frequently deter organizations from employing it. In many instances where Business Process Reengineering (BPR) has been tried it was when the old system reached its end of usability period and effectively "died" and had to be replaced.

2.4 Paradigm Shift

This improvement approach is the most drastic one known. It entails changing the very basis on which the organization is founded. A complete change, that may even go as far as changing the industry the organization operates in. A famous example is Nokia, that started out as a pulp mill and about 60 years after its establishment started producing electric products and then later turned into a mobile telephone manufacturer. Another example is IBM which transformed itself from a hardware company into a systems company, now offering mainly software, and consulting and integration services.

The mammoth changes required for a paradigm shift, and the enormous risks it carries, make this kind of an improvement approach fairly rare. In essence, it is possible to say that in many cases a paradigm shift is the creation of a new organization, with new missions, goals and success factors, that uses the old organization's resources as its staring point. Some paradigm shifts do not go quite as far as that, but the changes are, nonetheless, very drastic, and far-reaching.

Note: This approach will not be considered for higher education in this work.

3. Literature Review

The topic of reengineering received a lot of attention following the publication of Hammer and Champy's (1993) seminal work on the topic. Their book focused on reengineering in the business world, not the academic world. The literature of changes and improvements to higher education includes surprisingly few, relatively speaking, references to BPR applications to higher education. Perhaps it is just a takeoff on George Bernard Shaw's line: "Those who can do, those who can't - teach" (Shaw 2007). Some authors have written about this or similar topics. The topic of applying BPR to higher education appears in print much later than discussions of applying it to other types of organizations – private and public. Stahlke and Nyce (1996) discuss reengineering, but their discussion is about doing it in a

specific aspect of higher education – teaching and learning. While reengineering any part of higher education may yield desirable results (as well as end in abject failure), that paper restricts the discussion to piece-wise reengineering and does not take an overall view of higher education as a system. Rowley and Sherman (2001) describe various enactment plans for change implementation in higher education institutes, including reengineering, but are concerned mainly with the issue of how to implement a strategic plan once it is conceived and approved. Green (2003) analyzes different methods of reforming higher education, after agreeing readily that reforms are, indeed, demanded by many stakeholders and are needed in light of those demands and in light of the changing social, cultural and economic environments. Tunç (2013) also proposes reengineering higher educations, and suggests practical steps that need to be taken in order to succeed with such a project. His main proposal follows an approach that may be called "the industrial engineering approach", with the main goal being efficiency and improved "customer service". He suggests combining many functions, currently distributed among many units throughout the university into one comprehensive position that will envelop the students and cater to their every need and desire, be it academic, financial assistance, dormitories or anything else relating to university life. He calls the person that will be in charge of the student-facing operation "case manager". This approach resembles many reengineering projects in the business world, where efficiency, improved operations and enhanced customer experience are the major drivers of the reengineering efforts. While these considerations are clearly important to higher education, they do not materially change the basic concepts of the university, but merely make its operation more efficient in some respects.

Other looks at the future of higher education is presented in a recent book, Future of Higher Education: Perspectives from America's Academic Leaders (Olson and Presley, 2016). While very much centered on USA universities and colleges, nevertheless many of the insights presented there can be easily applied to many institutions of higher education Around the world. There are, among the chapters, some that take a macro-level view of higher education as a national system (for example Dasenbrock (2016)), but what seems to be missing is an analysis of the goals and purpose and the fitness – or lack thereof – of the current structure of higher education to those purposes. Even Massy (2016) in his book "Reengineering the University" deals exclusively with the micro level of the individual institution. He even provides practical, applicable recipes – up to the level of Excel templates – to help heads of higher education institutions reengineer their organizations.

4. Higher Education Reengineering – A Macro-Level View

Reengineering a single institution of higher education is, without any doubt, a formidable, arduous undertaking – fraught with risks and uncertainties at the institutional level, and even personal hardships for its protagonists. It is quite obvious why many leaders of higher education, even those who have the foresight to see the storm clouds converging over higher education, frequently avoid taking sweeping steps to remedy the situation and hope that the storm will not start during their term of office. That is because they are mindful of the energy they will have to expend on a reengineering project of an institution-wide scope and, on the other hand, they are keenly aware of meaning of failure. Sometime, they are even more apprehensive of the results associated with a successful reengineering project: will the newly structured institution still function well? Will the stakeholders find the newly reengineered institution acceptable? Will the public at large accept it? In business organizations, the task of reengineering the organization is frequently given to a new head of the organization, who is charged with this mission by the board of directors that sees the reengineering as the main

reason for appointing that person in the first place. A famous example is the reengineering of IBM in 1993 – carried out by Lou Gerstner, a former food and tobacco executive. Naturally, a new person at the helm is usually free of any intra-political obligations and is innocent of any previous errors in the new organization and therefore has more freedom to carry out even far-reaching projects as reengineering.

This hesitation is natural and understandable, but leaders are appraised on their vision, courage, and determination and not on "playing it safe till their shift ends". It is precisely the responsibility of leaders to do the right things, not the expedient ones. Thus, the question now is "what should higher education institutions look like in the next decades". Given higher education's notorious slow rate of change and long, protracted processes, the sooner this question is answered – and the answer acted upon – the better.

Higher education, it is possible to say, has been abducted from within. From a system aimed at research, educating the elites, and serving as a beacon of the achievements of the human spirit, it has become – if measured by the number of people using it for that purpose – an institution that trains the next generation of people to enter the workforce. It is true that professional education – for example law and medicine – has been a part of the higher education system for many generations, but those professions had what might be called "a big nucleus of academic content", and thus practicing them, instead of researching them, was an acceptable route to choose – as far as the institution's image was concerned. Today, while many other professions have some nucleus of academic content, their main manifestations are in the practical world. In addition, the prestige associated with academic degrees accelerated the conversion of previously non-academic professions into academic ones. This is not meant to be a criticism of those professions or of the academia that accepted them into its milieu, but rather to underscore the fact that many of the students of higher education join them not with the intention of becoming researchers but because their chosen occupation requires it, or the law prescribes such requirements or for social status. All these are valid reasons, and in some cases students who enter academia with one purpose change their minds and go into a different track, but the point is that most students view their academic education as a career requirement, not as a way of becoming researchers and joining higher education themselves as researchers and lecturers. This transition in institutional "outputs" has happened relatively fast – the last three to four decades, a short period compared to the millennia of university's existence. And, the change was not only fast, but in some ways it was misleading: institutions, faced with growing demand for their services did not stop to analyze the reasons for this increased demand, and saw it mainly, perhaps solely, as proof of their success, achievements, and value. While these may have been the part of the reasons while students chose a specific institution from among all others, the macro view was completely missed or ignored. Thus, the institutions grew – both in capacity and in number – and prospered for a while. The overall change in the desired outcomes sought by the "new students" was not culled from the data. (Perhaps if Big Data tools and concepts were available at the policy-making level – and used with the right questions – the conclusion would have been apparent sooner.) Higher education institutions found themselves, after a few years of growth and prosperity, serving a totally different student body – with different goals, different attitudes and different behaviors – than previously known to them. The growth also created some "mega universities", with enrollment of 100,000 and more. Most of the students wanted nothing more than a solid preparation for their work life. Meanwhile, the institutions continued to do what they have been doing for ages – research, and the preparation of the next generation of researchers. Only gradually did they change their conduct, and viewed the job-related training as part of their charter. Although the numbers are overwhelming skewed towards the training students, many of the higher education institutions, though, still take that part of their mission to be a sort of 'necessary evil' that they must put up with in order to support their primary activities of

research and training of scientists. Consequently, they tend to feel that they were the target of what is known in the business world as 'hostile takeover'. In many institutions, this dichotomy of purpose creates disagreements among those who concentrate on research and those who concentrate on teaching. Issues like budget allocations, staff recruitment, promotions criteria, tenure decision, and even office assignments, and more. Of course, the metrics for measuring the results of these two different activities are poles apart. Whereas research is assessed by publications and their impact, by prestigious academic prizes, by patents granted, and by applications, teaching (for work life) is appraised by number of graduates, by their acceptance in the marketplace, by their initial salaries and by their satisfaction from the process of learning. Both sets of metrics are used to some extent by institutions of higher education and can be used to derive some reengineering efforts at the institution's level – as advocated, for example, by Massy (2016).

The issue that looms large over all these efforts to reengineer the individual institutions – important as that may be for each institution separately – is that of the future of the whole world known as higher education. (Koch (2016) claims that higher education should be called an 'industry'). While there are numerous references in the literature to that big cloud of uncertainty, unknown future, disruptions and so on (and the 22 chapters in Presley and Olson (2016) are just a small sample of those papers), they seem to concentrate on the individual institution or prescribe a general solution in broad terms.

This larger issue alluded to is: Can higher education continue providing these two clashing services in its current structure? In other words, can the research (and education of the next generation of scientists) and the training for work life coexist in a single institution?

This question is of paramount importance for the future of our 'industry'. For the most part, people who are active in this 'industry' avoid this issue and just keep moving along the well-trodden path of cohabitation. Massy (2016) is one of the few to address this issue directly, and he claims that the two must coexist in the same institution. He calls this dual-purpose activity "Joint production" and claims "…this joint production is *the* major distinguishing feature of the traditional university". (Italics in the original text.) However, he then goes on (on the same page) and says, "It's difficult to cite hard evidence about the synergies between teaching and research, but I agree with the many commentators who believe that such synergies do exist in many circumstances".

Even assuming this belief holds true for the traditional university – is it going to hold true for the university of the 21st and 22nd centuries? For all institutions of higher education? For some? For the majority? For the 'industry' in general? With the advances in online education, with the rapid changes in society and in the workplace, is it reasonable to assume that the only rock-solid 'industry' that will remain unaffected, unchanged (barring intra-institution changes), and will still be able to prosper, thrive and deliver on its mission statement? All evidence points to the contrary. We are already seeing the changes all around us: for-profit institutions; degrees conferred through eLearning by reputable institutions; move to accredit experience attained outside higher education; micro-degrees that have both shorter learning cycle and shorter usability in the workplace; and more. These trends are growing in numbers and in variety. On the research side, an evident fact is that a growing part of it is being done by non-universities. Thinks, for example, about cyber; about pharmaceutical drugs; about computers; about social networks; the research done in these areas is carried out mainly by profit-driven corporations. These changes point to a process of accumulation: teaching is becoming more concentrated and separated from research, and research can thrive without teaching.

So, it seems that 'separation of power' is inevitable in the future. There are questions of the rate of change, and of institutional structure. While rate of change cannot be predicted with

any level of certainty, we know from Christensen (1997) that disruptions usually start slow and then at some point they accelerate and become destructive to the established players.

It seems to be clear now that reengineering in higher education should not only be directed at the individual institution level but also to the whole 'industry' of higher education. Simply put, if the industry is going to undergo a massive reorganization, the individual institutions will have to adjust to the new structure in any case, so we might as well understand where the industry is going before we try to reengineer any specific institution. That said, this is not a call for an attitude of "let's just whether the (impending) storm, and after that we'll decide what needs to be done to continue". It is vital, to all institutions, to be as robust and as strong as they can before and during this storm, and reengineering is certainly an approach to consider.

5. Higher Education Reengineering – Can It Be Done?

The answer to the question in this section's title depends critically on what the "we" stand for. If it stands for society as a whole, the answer is yes, since a system for research and a system for training the next generation for the workplace will exist, in one form or another, since they are both crucial to the welfare of society and its continued prosperity.

If the "we" stands for higher education as an independent, self-governing, and self-regulated 'industry', the answer is much less certain. The future of higher education seems to include a separation of research and teaching. Probably not completely separate, as some teaching is done during research, and some level of research is required in any institution of learning, but the joint production referred to by Massy seems destined to shrink considerably even if not completely. The structure of the industry providing research and education services to society will be in specialized organizations, each concentrating on its core mission – research or teaching but (usually) not both. (Exceptions, of course, exist in all industries.) The two organizations may be separate legal entities, each with its own management configuration and its governing bodies. They may also coexist under a unified ownership and joint uppermost management but they will have to operate as two separate divisions. Each division will have its goals, its budgets, its policies, its personnel (with minimal joint appointments), and its metrics, and may share only neutral infrastructure and services like facility management and accounting. Each division will have its own management team, responsible for achieving its goals with the resources available to it. The most likely form of the industry will be separate research and teaching institutions. After all, we have been teaching for ages that specialization is the key to success. Close ties between these two types of institutions will exist, for a variety of purposes: to enable those whose primary function is teaching to do some research and to be up-to-date on current research; to enable researcher to transfer their knowledge to the world of teaching; to enable joint teams; to provide positions for sabbaticals for both types of employees; and more. One of the major advantage of this separate existence but with strong cooperative ties is the freedom of choice afforded to both sides of the new structure: whereas currently most research-teaching relationships are limited to be within the institution, the new structure will enable each party to select its counterpart for cooperation – and change it, or add to it – as it sees fit without any structural constraints. Another major advantage of this new structure is, of course, the specialization that gives each organization clarity of purpose and a clear mission, without having to balance two competing sets of goals.

To answer the question above is, clearly, not a simple task. In previous works (see, for example, Raanan (2015)) this author has predicted that disruption is essentially unavoidable. The new structure presented above is certainly a possible reaction to a major disruption but in

way is it guaranteed. Of course, reengineering a whole branch of human activity, definitely one as important and as central as higher education, requires state-level efforts, leadership, and dedication. The alternative is, as always, to let nature take its course, that is to let market and social forces play out without trying to control them or direct them. Besides being a dereliction of duty by national leader and by academic leaders, higher education is one of mankind's most stellar achievements and leaving it completely to the vagaries of market forces seems like the wrong attitude.

6. Summary and Conclusions

Reengineering higher education was presented here, along with its meaning for higher education. A distinction was made between reengineering a single institution of higher education and reengineering the whole higher education system.

Reengineering the higher education industry is, indeed, a drastic move. Still, structural changes to other industries were done throughout the ages and are still being done today, in many areas. Just to mention a few examples from the last several decades, we can consider the restructuring of the following industries: telecommunications, media, computing, air travel, and more. In each case, the changes were brought about by technological advances – but not only. In many cases, government had to intervene in some way or another: remove barriers of various kinds; change laws; dismantle monopolies; invest in infrastructure; and so on. Every time governments perceived that the public interest was at stake – or could be better served – they intervened. It will be regrettable if governments stood on the sidelines and let higher education of the future be shaped by social and market forces alone. While the market is great arbiter, the mechanism is not without its drawbacks, primarily its built-in tendency to focus on the short term predominantly. As with other national infrastructures, a long-term view, is critical for higher education's future thriving. Consequently, governments should take an active role in reshaping higher education.

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