University as a Corporation Which Serves Educational Interests

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Abstract. This chapter focuses on analyzing the structure of a university as a corporation – a complex organizational and functional mechanism which serves educational interests. It suggests that looking at a university as a specific business corporation helps better understand, more accurately plan, and seamlessly implement the transformation of a university towards better meeting the requirements of academic reform and the society at large. It is demonstrated that managing a university as a corporation is more complex compared to conventional business because of bigger diversity of different aspects and facets to be regarded in a balanced and harmonized way. A conclusion is drawn that an Information Technology and Analytics infrastructure is imperative as an instrument for managing a university at all levels. Finally the evidence is given of a successful trial of this management model and approach in real world settings at Kherson State University during the last several years – in particular for training professionals in our Computer Science and IT programme.

Keywords: university, corporation, IT infrastructure, management, labor market, academic reform competence, education process.

1 Introduction

University management today faces several difficult issues in transforming their organizations towards being more effective, efficient, and competitive. One of important instruments in optimizing the performance of a university is Information Technologies (IT). Indeed, an IT infrastructure is a backbone which shapes the way several important questions in strategic and operational management are answered. Therefore the result of a proper deployment of IT components, implementation and proper configuration of an integrated IT infrastructure for a university needs to be regarded as one of the top priority assets influencing the performance of the whole organization. Under this facet university management needs to make several important decisions on: the configuration of investments into strategic development, IT in particular; specification, unification, harmonization, and deployment of business processes in management at all levels; a proper superimposition of those business processes on to the IT infrastructure; use of IT for making the processes and results of management activity more transparent to the employees, students, and society; and,

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last but not least, introducing appropriate incentives to managers at all levels for lowering their acceptance barriers with respect to new IT, working patterns, and style.

Resolving all these important issues in a harmonized and balanced way allows expecting a considerable increase in management performance – with positive implications to improvement in university competitiveness. For that, regarding a university as a corporation with specific inputs, objectives, and outputs may be helpful. If so, the methods, patterns, and best practices of corporate management may be tested at a university, hence adopting at academia better flexibility and adaptability of business organizations to market and economy changes.

The remainder of this chapter is structured as follows. Section 2 presents our motivation for the reported research in more detail and defines the focus – IT management. The related work is briefly reviewed in Section 3. Section 4 presents our main contribution – the model of a university as a corporation which serves educational interests. Section 5 presents our results in validating this model by applying it to IT management at Kherson State University (KSU) in a real world case study. Our conclusions are drawn and plans for the future work outlined in Section 6.

2 Motivation

In this chapter we explore the idea of adopting corporate management style and pattern at a University and elaborate it in a form of a model. A university in our approach to shape out its management is regarded as a corporation which serves educational interests. The focus on this specificity straightforwardly allows us to choose appropriate inputs, objectives, and outputs for management processes.

A university, very similarly to a corporation, is a big and complex organization with many important facets in management: human resources; finance; materials and procurement, teaching; research, development, and intellectual property; student government; public relations; etc. Successful and productive management of all these diverse aspects of university life is heavily based on collecting, processing, analyzing, and communicating information. Therefore, IT and information management needs to be regarded as a first priority activity in this broad spectrum. This premise motivated us to choose IT management as the focus of our research.

One of important strategic level corporate management tasks is to develop a pathway for a university to maintain or even increase competitiveness on the market. The same is fairly true for universities today – the environment is the market of educational services. The complications at this market are its volatility and a tendency of toughening the requirements to university graduates in terms of the quality of their professional capabilities. These specificities imply that a well-managed university behaves like a business corporation – is adaptive to emerging loci of influence, redistribution of those influences. Adaptation mechanisms are incorporation of external units or bodies in the university structure, inclusion of these new units in decision making processes, adoption and adaption of new approaches, mechanisms, workflows, and policies for better decision making. For example a tendency today is involving students and staff in decision making processes as first class citizen with capability and authority proportional to university management. These changes

factually trigger the transformation of the behaviors of different groups of people contracted to a university to a corporate behavior.

In the settings circumscribed above the role of IT managements receives substantial importance. Effective and efficient IT management allows quickly and adequately implement required changes – both in management strategies and operations – with substantially less effort and in shorter time. So the overall performance of university management increases and the organization becomes more responsive and adaptable to environmental changes reflecting the evolution of societal needs.

Consequently, perceiving a university as a corporation which serves educational interests of its students allows to shift the emphasis of university educational service from traditional communication of knowledge from a professor to his students to establishing an educational environment or infrastructure. This infrastructure provides much richer opportunities both for a tutor and a student. For a tutor it facilitates creating all the necessary educational information resources and substantially extended interface for communication. For a student it guarantees right-on-time delivery of personalized educational material in the contexts of different disciplines and in different modalities. Straightforwardly, Information and Communication Technology (ICT) infrastructure and tools play a very important role in that as an instrumental basis of the outlined educational infrastructure that facilitates better satisfying intellectual requirements of all involved categories of knowledge workers.

Our extensive analysis of the published best practices of university management unfortunately did not reveal reliable and robust methods for measuring effectiveness and efficiency (i.e. performance) of IT management in academia. To the best of our knowledge, the influence of introducing performance measurement practice on the improvement of IT support to the abovementioned facets of academic activities – in particular organizational and process optimization, strategy development, decision making, and ultimately, the professional capabilities of the graduates. Therefore we hypothesized that adopting a corporate management model (where all the required metrics, mechanisms, and best practices are in place) to university IT management will provide a desired outcome. We believed that such a hypothesis may be formulated also because universities cooperate with industry in many aspects and adapt this interface to industrial standard. One of relevant examples is involvement of business leaders in creating and developing new organizational capabilities at academia for better integration into the labor market and prompter reaction to market requirement to the major academic product – their graduates looking for employment and carrier building in industries.

Based on that, our grand objective in this research was to investigate how the introduction of an appropriate and comprehensive IT infrastructure at a university will increase the performance of university management and, consequently, the quality of the academic product provided to the labor market. Methodologically we:

- Regarded a university as a specific corporation which serves educational interests of students. We also supposed that their interests are coherent to the requirements of the labor market and evolve in line with these requirements. Hence, educational interests are in fact the reflection of what is expected from university graduates in terms of their professional competencies. For further implementation of this view the model of a university as a corporation has been elaborated.

- Used the corporation model for proof-testing it in a real world case study focused on analyzing the performance of IT management at Kherson State University. The infrastructure and preconditions for this case study have been developed in our previous research and development activities [1].

3 Related Work

Our research reported in this chapter is based on several interrelated aspects relevant to managing and productively using IT in business. The first building block has been taken from the review of the best practices in business by the Center for Information Systems Research of the Sloan School of Management at Massachusetts Institute of Technology. Their review is based on the analysis of using information technology (IT) practices in business by more than 250 companies [2]. Apart of very useful and valid factual material on the use of IT, one valid side effect of this report is the confirmation of the importance of the role of IT and IT infrastructures in modern enterprises. Notably, it has been shown in [2] effective use of IT management for implementing strategies leads to success of institution. In particular companies that were successful in their IT management had more than 20% higher profits than similar companies with the same strategy but with ineffective IT Governance [2-4]. Another confirmation of the importance of IT in performance management is given by Melchert and Winter [5] who also define performance "*as valued contribution to reach the goals of an organization.*" We follow this definition of performance in our research as it straightforwardly connects means to ends.

In the vast body of relevant publications in business performance management domain, the papers focusing on modeling performance were of particular relevance for our work as we were seeking for proper metrics and methods of measuring performance of IT management. A good review of performance management practices, perspectives, and measurement models is given in [6, 7] resulting in the proposal of a Performance Ontology [7].

According to the performance management literature (e.g., [8]), the most popular frameworks for performance measurement and management (PMM) are Balanced Scorecards, Business Excellence Model, Performance Prism. Those frameworks are based on the introduction of a set of interrelated performance indicators.

Based on the analysis of the related publications, it may be stated in a summary that IT management serves as a strategic driver for each successful organization today. The competitive advantage of an organization is determined not just by the presence of effective mechanisms for collecting and processing various information resources and providing them to their customers (students and their employers in case of a university), but also the ability to transform these resources into their corporate actionable knowledge.

4 University as a Corporation

A business corporation (further – a corporation) is a legal business entity, formed as the union of individual founders and functioning independently of them. A

corporation has economic objectives guiding its business activity [9]. A big corporation normally generates influences on the society, hence needs to elaborate its social orientation and responsibility [10]. As a legal entity, a corporation has to act according to the normative environment – i.e. comply with relevant normative rules and laws. It has to respect consumer rights and interests, take care of its employees. All these aspects have to be treated harmonically and lay the basics of the corporate culture with implications to specifying the code of employee behavior, corporate traditions, etc.

Corporations sell products or services. In a market oriented economy corporate income strongly depends on the quality of product which is one of the major indicators of competitiveness. For a university, regarded as a corporation with a specific focus on education, the markets are: (i) labor market; and (ii) the market of educational and related services. With respect to the labor market the product of a university is their graduate. Product quality is therefore the quality of the professional capabilities of university graduates. Hence, a university as a corporation has to set the assurance of providing quality professional capabilities to their graduates as one of its primary objectives. At the market of educational services, a university sells not their graduates but teaching and learning services to their students and, perhaps, to other academic entities. So, one more primary goal for a university is to assure that the quality of their teaching materials is competitively high.

Perhaps because of the outlined similarities between modern academic organizations and business companies an opinion that a university and, at a higher level, an academic system in their structure and action resemble a corporate system very much, also in public opinion. Moreover, as a university is an organization providing substantial societal impact and in a large proportion use public funding, taxpayers identify themselves as, so to say, university stockholders with an influence on forming management structure. In fact a university president, though elected internally by a university council, is in fact assigned to this position based also on the opinion of the regional community – the stockholders. If so, the stakeholders will be more willing to become also the customers of the university corporation – as students and their parents who pay for educational services in some way. Hence, market relationships and their specificity needs to be taken into account in all aspects of university management.

As in any other type of business corporations, business information at a university is a specific type of information tightly connected with and influencing decision making at all levels of management structure. Business information covers the internals of a University (human resources, student contingent, educational programmes, budget, funding sources, etc.) and external environment of a university (e.g. government order, situation on labor market, economic indicators like an average salary in industry, tariffs for communal services, state tax policies and so on). Hence, collection and timely processing of all the relevant facets of business information is of a high priority for university management as it influences noticeably the pragmatic decisions they make and further implement in the corporation. It is also important that only valid or reliable information is taken into account that depicts the internals and externals in a fair and unbiased manner. Basing management practices on objective facts will substantially increase the effectiveness and efficiency of

management, compared to a widely spread practice in which strategic decisions are often made based on personal subjective attitudes and perceptions, traditional business patterns, or intuition of senior university management. Possible inconsistencies between objective business information and subjective business knowledge have therefore be resolved using known methodologies and best practices of knowledge elicitation and acquisition (e.g. [11]).

A well-known fact is that knowledge based businesses and corporations face information overload (e.g. [12]) which implies knowledge acquisition bottleneck (e.g. [13]). The trend is that these problems will be sharpened in time as the volumes and velocities of incoming information increase. Therefore the importance is growing of using an IT infrastructure as a corporate instrument that supports timely, reliable, and effective information processing, knowledge acquisition, communication, decision making. Introducing IT instruments in all relevant business processes and ground them in a coherent IT infrastructure increases the performance of business information and knowledge processing and, consequently, university management – improving timeliness, objectivity, and completeness of knowledge acquisition and use for decision making which now is able to account all the related information facets and aspects. For example the corrective actions in a student enrollment company may be proposed and approved based on monitoring the dynamics of enrollment applications. Statistical information about paying education fees by students may trigger the expulsion of those students who break their contractual obligations, but also help predict the financial balance of a university.

Our experience in implementing and deploying such an IT infrastructure at Kherson State University (KSU) convinces that a properly configured IT toolset provides qualitatively better possibilities to have access to and process information sources inside a university. Using IT in our Information Analytical Systems (IAS) allows effectively collect up-to-date information about the key aspects of organization activities. For example at our university we have developed and deployed the following modules of the university IAS [14] that help significantly increase management performance:

- Planning and financial accounting [14] comprising human resources and students;
- Financial bookkeeping [14, 15] comprising debits, credits, and transfers for personnel, students and contractual obligations;
- Materials accounting [14, 15];
- University entrants [14, 15];
- Academic accounting [14, 15].

The IAS as an infrastructure facilitates providing reliable and relevant information in particular by maintaining the system of access rights and personified services for all involved management roles and serves as an information integrator. Integration of information provided by IAS means that all authorized users acquire all available and relevant business information in the form of automatically generated reports. These reports are further used to fulfill functional duties. IAS also helps generating reports for external bodies like governmental agencies: the Pension Fund, Tax Administration, National Statistical Office, Ministry of Education and Science.

Universities as corporations active on the market of education services use IT as an instrument for obtaining the following impacts:

- Extending the contingent of students as customers, expanding the spectrum of educational services
- Reducing uncertainty and lowering risk while implementing strategic management decisions at operational level. For example, opening of new educational programmes, creation of new business units, expansion of material base that requires constant renewal, etc.
- Positively influencing certain aspects of society and regional community
- Improving university corporate performance through monitoring and evaluation of internal performance indicators such as quality of teaching and learning, quality of personnel, availability of computers and information resources, library funds, etc.
- Improving university corporate competitiveness through monitoring and evaluation of external performance indicators such as the proportion of successfully employed graduates, business testimonials with respect to the professional capabilities of graduates, participation in international programmes, etc.

It has to be noted that solutions of university management and education process issues are not only be sought within economic and legislative facets. The mentality of stakeholders is also a very important aspect that may be a source of serious blocking factors for academic reform. For ensuring that the reform is performed in a proper and coordinated way the code of desirable behavior [2, 15] has to be changed in a way to stimulate rational acceptance of IT in management practice. Both material and immaterial incentives may be used for that. .

In the context of globalization university is gaining new features. Providing, supporting and dissemination of culture – the main mission of a university in the XIX - XX centuries – fades into the background. Other roles come to the forefront of university management activity: adaptation to the current socio-economic and political changes and cooperation between a university and the society. At the National level cooperation partners comprise the State and its governmental bodies, while at the Global level the partners are academic peers and international organizations. Anyhow, these changes in management priorities still have to be properly focused on satisfying societal educational interests.

A Business company usually focuses on profitability as a major indicator of competitiveness. In contrast to business in general, the major focus of university business is on continuous commitment to provide quality education to its students – which subsumes profitability indirectly and in a broader, not only material sense. Due to this broadness the business model of a university corporation is naturally richer and comprises more aspects. The most important are: attractiveness for students; richness of the portfolio of educational programmes supported by the appropriate institute and departmental structure; the disciplines and their curricula; teaching and didactical materials; diversification of the funding resources; and, last but not least, the IT infrastructure and resources required to manage university business. These factors must be always considered in a harmonic balance to achieve the goals of the university.

For achieving a proper balance on all the scales an effective and efficient management system needs to be implemented with a focused use of relevant IT

instruments. In the context of the major objective – improving teaching and learning quality – the performance of educational process needs to be addressed in a close cooperation between teaching departments who manage the process and IT management who provides and maintains the tooling for teaching and learning.

Table 1. The specificity of increasing performance at university corporations

Factors relevant to improving performance in a business corporation	**The specificity of related indicators in a university corporation**
Increase of income	Diversifying the portfolio of funds by acquiring scientific and technological capabilities and resources for National and International funded projects. Harmonically combining research and teaching.
Increase of product quality	With respect to education services, v Publishing and carefully maintaining teaching and learning resources digitally using university IT infrastructure. Establishing digital communication culture among all stakeholders, comprising academic staff and students. With respect to producing graduates: ensure that the education service infrastructure is effectively and efficiently used for constantly improving professional capabilities of students throughout the whole period of study.
Improvement of staff competencies	Using integrated, corporate, personalized information and analytical system to support business processes at a University.
Modernization of equipment. Priority is given to the core production facilities.	Very similarly to a business corporation, except the core production facility is the complex of educational services based on the IT infrastructure. Hence, investment in the IT infrastructure has to be a priority one.
Modernization and optimization of technology	Again, very similarly to a business corporation, except the technology is different – didactics. For making didactics effective and efficient a proper IT support has to be at hand.

To summarize the analysis of the common features and differences of a business and university corporation several analogies could be drawn as shown in Table 1.

5 KSU as a Corporation Serving Computer Science and IT Students

In this section we provide the evidence of how managing KSU as a corporation and introduction of the university IT infrastructure helped us increasing performance and better serving the interests of Computer Science and IT students.

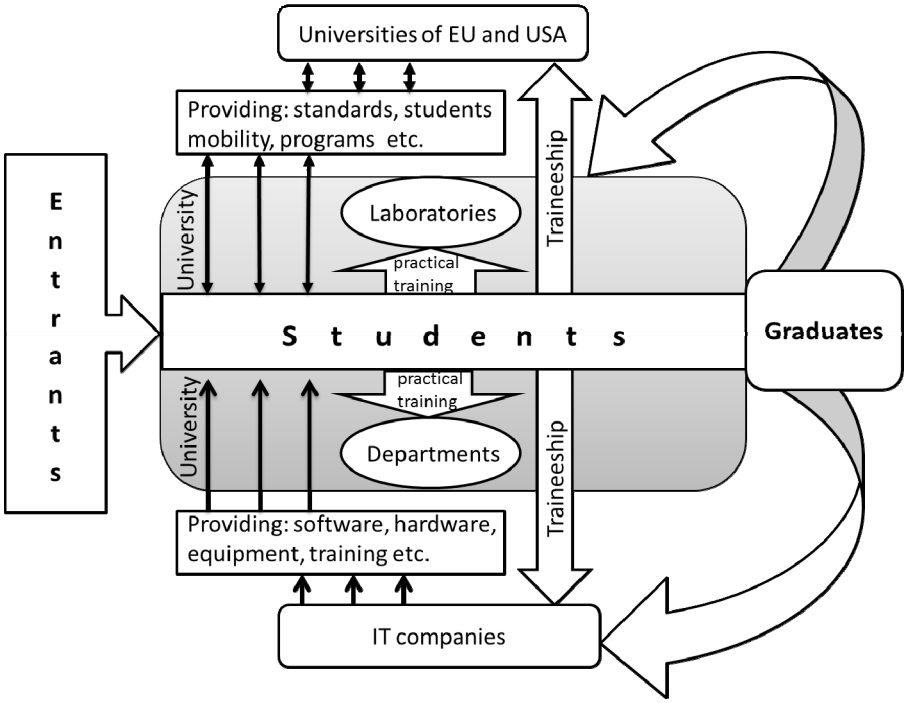
For creating the preconditions for developing highly professional specialists at KSU many resources and web services are designed, implemented, deployed, and widely used in teaching and learning processes. All these help academic staff create information and communication environment where they can share their learning materials, communicate and work together with students on developed courses. Starting from the first year of studies at the university our students have an opportunity to observe the changes and innovations in information technologies, take part in software development projects which extend and refine the IT infrastructure and IAS. So, they combine active participation in a traditional education process with obtaining practical experience of software development in an environment that is very similar to software industry.

In addition to that our senior students explore the benefits of several partnerships of KSU with several external business companies working in software production: DataArt (www.dataart.com), PostIndustria (www.postindustria.com), Aricent (www.aricent.com) and many others. Well-formed and mutually beneficial cooperation between competent IT professionals from these industrial companies and students having their internships at the companies helps identify, reveal, and further develop the creative traits of future specialists. Student internship projects therefore yield results that are seamlessly used in industry and produce business value. The situatedness of our students in the industrial environment is also very helpful in validating the quality of the professional capabilities they have obtained at the university. Furthermore the environment motivates students well to continue their professional development.

Our training cycle that involves industry as a stakeholder is sketched out in Fig. 2. Starting from the 1st year the students in a Computer Science and IT programme are taught several fundamental and applied disciplines. Didactics for these disciplines involves the use of many teaching software tools for illustrative purposes, as simulators, for providing teaching and learning materials. The tools are managed and configured and the feedback from students is collected using the university IT infrastructure. Leading specialists from the partner IT companies are involved in the educational process as tutors for the applied disciplines.

IT management at KSU comprises several IT departments for providing software and IT services, supporting business and academic processes, technical support. Starting from 2nd year of study our Computer Science and IT students are given an opportunity to apply for a part time job in these departments. Successful applicants become a part of our IT management and development team and work in the projects

of these departments that develop, maintain, and manage information resources and services. In addition to industrial internships mentioned above our senior students are directed for traineeships or scholarships to study and practice at the universities in France, Germany, Great Britain and USA.



Legend: ▭ – university with its information and communication infrastructure

Fig. 1. Computer Science and IT training cycle at KSU

The result of implementing this training cycle is very positive. Those graduates who passed it have much better chances to be employed either at industry or by a university department because: (i) their professional capabilities have been formed under direct influence of and with full account to the requirements of these employers; and (ii) they are already known to the employers.

Our academic infrastructure also creates good opportunities for those students who choose to develop an academic carrier. Students involved in research and development projects become well known to our internal and sometimes external leading scientists. So, it is much easier for them to select a scientific adviser for post-graduate studies. For fostering exchanges and further cooperation between our senior students and scientific communities KSU is active in organizing and hosting academic conferences. In ICT domain for example, KSU host ICTERI conference series (icteri.org). Our academics together with students are active in submitting their research and development results to these conferences.

Finally it may be noted that such an organization of teaching and learning in our Computer Science and IT programme not only increases the performance and refines the capabilities of knowledge workers considerably, but also creates an attractive and comfortable professional environment for students and academics.

6 Conclusions

In this chapter we formulated a hypothesis that looking at a university as to a business corporation may be a correct approach to improve performance in management and academic activities. We exploited many analogies between a business corporation and a university which, put together in a coherent management model, allowed us to adopt industrial best practices for performance management and improvement in academic environment. We also figured out the specificities of a university as a particular kind of a business corporation. Important ones were the objectives, the impacts on the society at large, and the specific markets where a university sells its product – educational services and graduates. Last but not least, we found out that managing a university as a corporation is more complex compared to conventional business because of bigger diversity of different aspects and facets to be regarded in a balanced and harmonized way. We drew a conclusion that an IT (and IAS) infrastructure is imperative as an instrument for managing a university at all levels.

We have also provided the evidence of a successful trial of this management model and approach at Kherson State University during the last several years – in particular for training professionals in our Computer Science and IT programme. Practical results testify that the major performance indicator for an academic programme – the proportion of graduates who are employed and continue building their professional carriers became much higher than it was before. As a conclusion we may now state as practically proven that the investment in implementing and further developing an integrated university IT infrastructure is one of the most effective and efficient kinds of investment. It increases the competitiveness of a university corporation and makes it firmly established on the markets. It facilitates impacting the stakeholders and the society in broad in a proper and constructive way.

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