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# A Holistic View of University and Its Governance

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**Abstract.** In this short article, I will first outline the blueprint of the complex systems governing a modern university. Then, I will discuss some better ways of conducting teaching/learning, research/innovation, and appraisal/promotion in a modern university.

## 1. Introduction

Today's world is facing a challenge of educating young generation with life-styles of greater comforts and less physical hardship [1,2,3,4,5,6]. In some parts of the world and especially in Asia [6], people are confused by different ideologies about the exact roles of a university in this modern age.

One confusion is whether we should treat students as commercial customers or educational products. A second confusion is the debate on whether we should promote a student-centric approach or professor-centric approach in education.

These situations are partly due to the social value system or culture [5,6], and the lack of systems' approaches in the study of a university itself. And, the following fundamental questions are still waiting for better answers:

1. What is a university from systems' viewpoint?
2. How to balance the effort of teaching by professors and the effort of learning by students?
3. What is the exact meaning of a research university?
4. How to evaluate, and recognize, the achievements and efforts of professors in both teaching and research?

The aim of this article is to shed light on objective answers to the above questions.

## 2. The Systems in a Modern University

A university is a combination of multiple systems. First of all, it is a system of transferring knowledge and skills from generations to generations. In this sense, a university is a place which augments the intellectual and skill-related power of students for the purpose of solving problems in society. Secondly, it is a system of training people with the know-how of applying knowledge and skill for the purpose of inventing new technologies. Thirdly, it is a system which enables dedicated people to discover or create new knowledge about the nature, human beings and societies in a conducive manner.

As shown in Fig. 1, the outcome of invented technologies will enable a university to nurture start-up companies, which aim to transform technologies into viable products. According to Fig.1, it is clear that universities could be classified into three categories:

- Category A: Universities which only undertake knowledge transfer.
- Category B: Universities which undertake both knowledge transfer and knowledge application.

- Category C: Universities which undertake the transfer, application and creation of knowledge.

And, it goes without saying that only universities of category C could be claimed to be research universities which not only transfer knowledge but also create new knowledge.

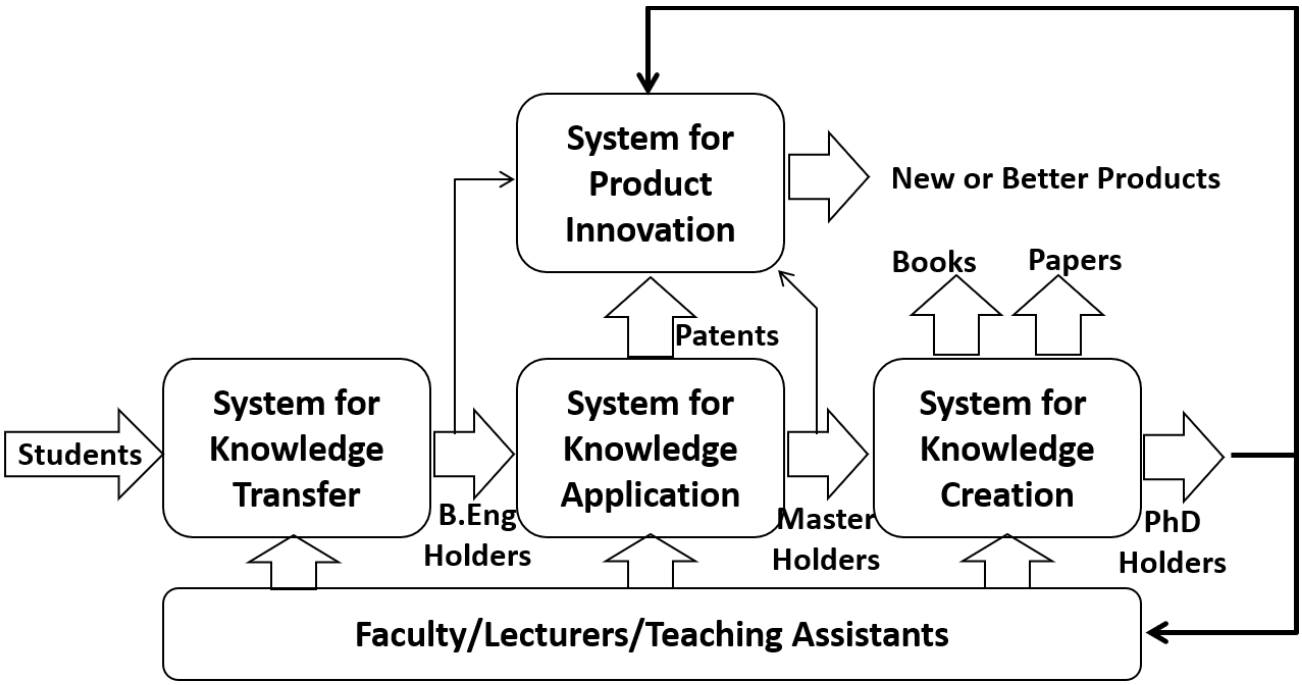


Fig. 1. A holistic view of four fundamental systems inside a university (Note: we did not include resources, such as tuition and funds, as well as other factors such as social recognition or reputation of a university).

## 3. Teaching and Learning

The twin engines underlying knowledge transfer are teaching by professors and learning by students [1,2,3,4,5,6].

It goes without saying that students can still learn in the absence of teaching. If we let T denote the effort of teaching and L the effort of learning, learning outcome will be zero if L is zero regardless of the value of T. Moreover, learning outcome will not be zero even if T is zero as long as L is not zero. Hence, if I denotes index of learning outcome, index I of learning outcome will be a function of (1+T)*L. As a result, the process of knowledge transfer must be student-centric. Clearly, learning is more important than teaching.

Therefore, the focus of knowledge transfer should be placed on the appropriate allocation of time to students so that they can systematically exercise their abilities of reading, presenting, doing, writing, listening, and putting learnt knowledge into applications.

## 4. Research and Innovation

There are people who still believe that good teaching is sufficient enough for universities to survive. They even question about the necessity of encouraging professors to pursue research. Those people do not see the following two motivations of pursuing research in universities [1]:

First of all, everyone knows that knowledge must be created before it can be transferred to younger or newer generations. And, universities are the best places for the discovery, innovation and creation of new knowledge. Hence, it would be short-sighted if universities in a developed world do not spend resources on knowledge creation. And, the major players in the process of knowledge creation should be professors.

Second, new knowledge will enable the invention of series of new technologies, which will, in return, trigger the innovation of series of new products contributing to better life. Since professors are in better positions of mastering new knowledge, knowledge application must be under the guidance of the leadership of professors.

In view of the above-mentioned two motivations, it is also clear that the process of research and innovation must be professor-centric.

## 5. Appraisal and Promotion

Appraisal and promotion is a problematic area in the governance of a university. This fact is witnessed by the absence of a widely-adopted common methodology underlying the process of appraisal and promotion of faculty members in a university [1,2,5,6].

Interestingly enough, some universities, which are ranked within top 100 world-wide, still employ unsound practices such as: measuring a faculty member's teaching performance by a sole indicator of student feedback, nomination-based consideration of promoting faculty members, measuring a faculty member's research achievements by indirect indicators such as citations, impact factors and H-index, etc. Clearly, these are only a subset of a much wider spectrum of quantifiable indicators which could better measure the outcome of a faculty member's achievements and efforts.

Then, people may ask this fundamental question: what should be the quantifiable indicators which enable universities to measure a faculty member's achievement and efforts fairly and objectively?

In order to better answer the above question, we propose a closed-loop appraisal and governance scheme as shown in Fig. 2, in which some important details are as follows:

- Outcome: This is the most confusing domain about the appraisal and governance in a university. As highlighted in [1], there are a lot of partially correct viewpoints. One way to unify these views is to adopt the notion of products and services, since a university is a not-for-profit social enterprise. In this way, it will be easier for us to identify these four educational products such as: textbooks, lecture slides, exam papers and students taught within a time window, as well as these four-types of educational services such as: in-class lectures, laboratory supervisions, project supervisions and setting/marking/checking of exam papers. Similarly, four products as a result of research could be: monograph, research papers, patents, and trained research students/manpower (e.g. post-doc, research fellows). And, four-types of services undertaken in connection with research could be: writing of proposals for research grants, supervision of research students/manpower, undertaking of funded research projects, and communication of research results.
- Appraisal: This is also a challenging area in the governance of today's universities. The cause behind such challenge is the lack of quantifiable indicators. According to the above-mentioned outcomes in terms of teaching and research, we can easily define two quantifiable indicators for each product and each service. In other words, each product or service will have two quantifiable indicators: the quality indicator for the measurement of achievement (i.e. quality of product or service) and the quantity indicator for the measurement of efforts (i.e. quantity of hours spent on achieving a product or a service). For example, a textbook written by a professor is his or her educational product. In this case, the quantity indicator can be estimated on the basis of the

number of pages of the textbook. And, the quality indicator can be judged with the labels of A (excellent), B (very good), C (good), D (normal), and E (not-so-good) which could be decided on the basis of media (e.g. whether in English or other languages) and the reputation of the publisher.

- Standards: As discussed above, there are eight quantitative indicators and eight qualitative indicators for teaching. Similarly, there are eight quantitative indicators and eight qualitative indicators for research. All these indicators are quantifiable and hence measurable. And, the sum of quantitative indicators can serve as a judging criterion which determines a faculty member's reward, while the sum of qualitative indicators is a good judging criterion which determines a faculty member's promotion. The minimum values of these two sums consist of the so-called standards for promoting a faculty member. The standard's values or threshold can be collectively set by a university in a transparent manner.
- Promotion: A faculty member's promotion is normally reviewed and determined by a committee. The existing practice world-wide is to let the committee member to subjectively make the judgment by a process of candid voting. However, with the establishment of a set of quantifiable indicators as mentioned above, the mission of a promotion review committee will consist of the following tasks: a) verification of a faculty member's outcome in terms of products and services, b) verification of his or her quantitative indicators as well as qualitative indicators, c) judgment of his or her quantifiable indicators against the standards, and d) decision of reward and promotion on the basis of above judgment.

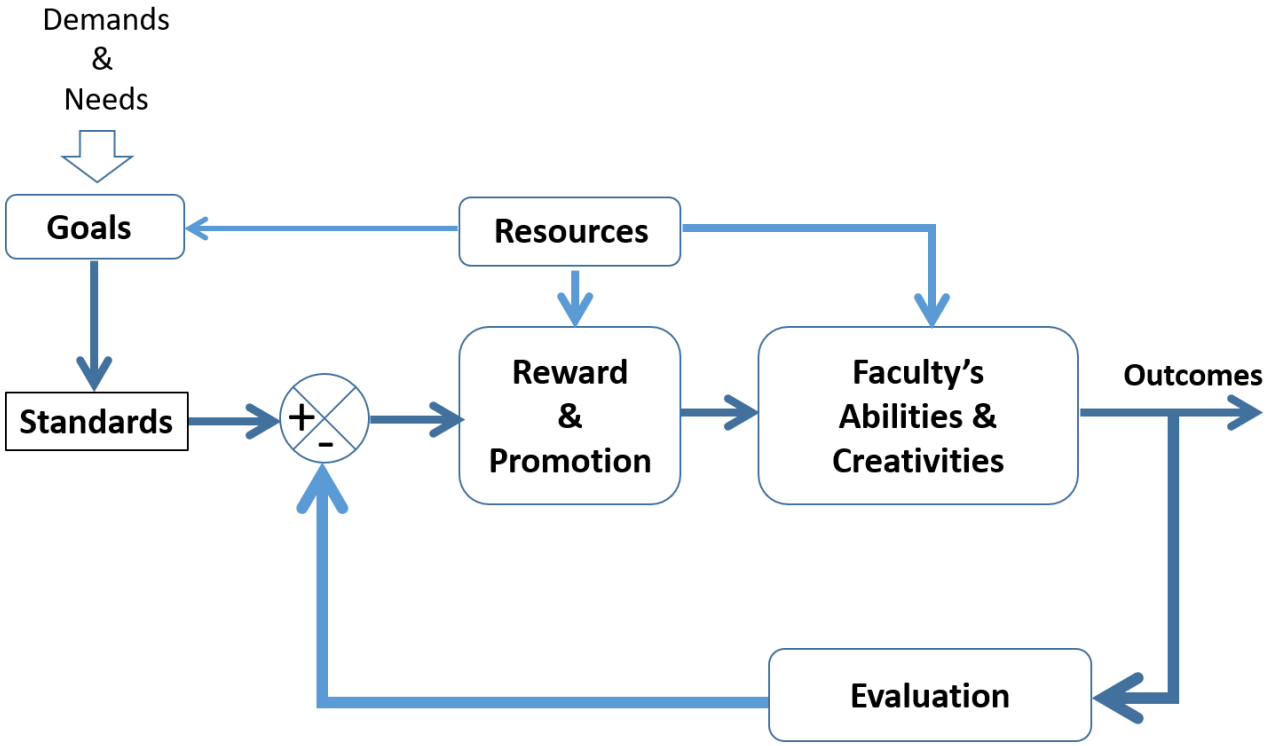


Fig. 2. A closed-loop appraisal and governance system inside a university.

## 6. Conclusions

In this paper, I have outlined the four basic systems inside a university. On the basis of the blueprint of a university's system, I have made it clear that teaching and learning must be student-centric while research and innovation must be professor-centric. Most importantly, I have put forward a closed-loop appraisal and governance system in which one can at least identify sixteen

quantifiable indicators for teaching as well as sixteen quantifiable indicators for research. These indicators allow us to set the standards of reward and promotion convincingly, and to guide the promotion review committees to carry out the tasks of judging a faculty member's teaching, research, and making the right decision of reward and promotion fairly and objectively.

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