

REFORM AND REMODELING OF THE UNIVERSITY AS A COMPLEX LIVING SYSTEM

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Abstract

Living biological systems undergo continuous remodeling processes. There are short-term changes and long-term evolutions. Reform processes in living social systems like universities may serve as interesting models for the understanding of reactive structural and functional remodeling.

As former Rector and Dean of Medical School I use the example of the Karl-Franzens-University in Graz to demonstrate the effects on a complex system of a sequence of reforms, the outcome of which is still doubtful. The topics, which have to be considered in such an analysis to explain certain consequences of the reforms from the viewpoint of physiology is: chronobiology, ethology, psychological and psycho-pathological phenomena as well as flow of energy and information. In the special case of the new laws concerning the organization of the universities, an "amputation" of the medical faculty as a Medical University, a reform of the medical studies and a reform of the employment law were ordered. The sequence of events was so fast, that the consequence has to be considered a "shock-therapy". For the description of the result of introducing massive economic stimulation within short time in former communist countries. It turns out, that a comparison of the behavior of a large complex living system like a University with a biological organism is quite instructive.

Key words

chronobiology, psychology, social development

INTRODUCTION

From my viewpoint as a physiologist and in the position of Rector of the University (1989-91) and in the position of Dean of the Medical Faculty (1992-97) I was able to observe my Alma Mater as a complex living organism (2). From the viewpoint of a historian Alois Kernbauer has vividly described the chronobiological cycles of our University (3).

The special peculiarities of complex systems like Universities are their non-linearity and non-stationarity. The basic living components like teachers, students and supporting personal have different cycles of presence and aging within the system.

The system is not closed, but is open to exchange with the environment and, in particular, to influences from outside sources. Here we will discuss influences by reforms, which are ordered by federal laws.

The term reform-experiment has been used (4) in order to underline the hypothesis that the goal of several reforms concerning the Universities either was not clearly defined or certain goals were kept secret for political reasons. Part of the reform, therefore, was left to spontaneous remodeling.

THE PROBLEM

In all living systems functions tend to be optimized. Furthermore, in general the level of all functions is adjusted markedly below the upper limit in order to permit adaptation to increasing load. In order to understand the system the aspects of time and timing has to be examined. Furthermore quantity and quality of the input output relations are important and at the same time the different flows of information as well as the relation between information and knowledge including the storage of information and knowledge.

Any living system obeys certain rules of similarity, which predict the relation between size of the system and its properties related to system time and function. Since complex socio-biological systems consist of autonomous living components, such systems can be expected to have higher complexity and unpredictable spontaneous behavior. There appear to exist characteristic time intervals, time periods and time constants, which permit e.g. to describe the time course of normalization after a disturbance.

Such a disturbance may be a reform, which demands marked changes in structure and function. The reaction, at least in part, may be called remodeling indicating the adaptive reaction of the system. Therefore, after each reform, a period of spontaneous remodeling and slow adaptation may follow. An overruling of this reactive process may lead to a condition of shock (1). As an example the remodeling after the reform of 1975 lasted at least 10 years, in some peculiar aspects even 20 years. From the viewpoint of a physiologist therefore any reform has to consider quality, quantity and time.

In biological systems the relation between these components has been named symmorphosis.

SYMMORPHOSIS

There are many ways to economize and optimize the function of living systems. Of course, it cannot be denied that many ideas about biological economy and optimization are incompletely understood. The same is also true for large complex living systems like Universities.

Without any question there ought to be an optimal or ideal correlation between structure and function.

Ewald Weibel in his book "Symmorphosis" (5) has summarized the adjustment in human beings and in animals of the adequate development of structures in relation to their function. The term symmorphosis indicates the necessity that a certain structure is ideally adapted to performing specific functions.

Weibel (5) describes his definition of symmorphosis as follows: “State of structural design commensurate to functional needs resulting from regulated morphogenesis whereby the formation of structural elements is regulated to satisfy but not exceed the requirements of the functional system. It is obvious that the principles of adaptation, integration and economy are satisfied if structural design is commensurate to functional needs throughout the organism.” There are many ways to economize the function of the cardiovascular system. Of course, it cannot be denied that many ideas about biological economy and optimization are incompletely understood.

OPTIMAL CONDITIONS

There are certain preconditions for the successful new foundation of a University. The same preconditions are valid for a successful reform of a University.

There must be a clear concept, which is based in previous experiences. Since the first European Universities were founded in the 11 th century the “UNIVERSITAS MAGISTRORUM ET SCHOLARIUM” was a basic and essential concept.

Furthermore, the ideal concept of Wilhelm von Humboldt (1810) should be considered as valid. He proposed 1810 the fundamental „3 columns“ on the occasion of the foundation of the University in Berlin (6).

- Freedom of research and teaching,
- Unity of research and teaching,
- Priority of general education over occupational learning.

For the realization of the concept it is necessary to invite the best and most experienced persons from the home country and from foreign countries.

These persons have to receive far-reaching trust, competence and autonomy.

HISTORY

In the time before Humboldt the freedom of research and teaching was not always a central demand of Universities. When the University of Graz was founded as an institution led by Jesuits in 1585 by Erzherzog Karl of Inner-Austria the basic idea was to teach students in the sense of catholic counter-reformation. In any case the Jesuits were, and still are well known as excellent teachers.

During the past nearly 420 life-years of the University in Graz this institution had to tolerate several reforms, times of flowering, however also crises and catastrophes (2,3). One most serious catastrophe happened during the Nazi-dictatorship.

The attempt of modeling the University as a complex system has to include historic descriptions, statistical time series of data like number of teachers, of students, support by government and other sources etc. In addition it is necessary to consider ethology, human relations, psychology and psychopathology (7), information theory, game theory and ethics.

The following key words are of interest:

Chronobiology

Flow of energy and money (power, effectivity, efficiency)

Flow of information and storage of information

Psychology (anxiety, resistance to changes, tradition)

Ethology (pecking order, prestige)

FIRST PERIOD OF RECENT REFORMS IN AUSTRIA

During the time of my activity at the University in Graz from 1972 to 2000 there were 2 major periods of reforms.

The first of these reforms was determined by the federal law from 1975 for the organization of the Universities (Universitäts-Organisations-Gesetz, in short: UOG 75). This reform was a consequence of the student-unrest or revolution in the year 1968. The UOG 75 brought "democratization" against the protest of the professors. The influence and power of the group of professors was reduced and the influence of assistants and students in all fields of interest like appointments, budget, teaching, was markedly increased. The number of meetings and the number of members of committees increased. Therefore the information flow within the University became high.

All reforms had an influence on the pecking order of many involved persons in the Universities. From the viewpoint of ethology it is interesting that the new pecking order in any reform differs from the more or less natural pecking order, which had developed along the years before each reform. Of course, according to the natural trend of stability it takes quite a time until the new pecking order was accepted. In many cases this development led to problems. In each group there were persons who developed into what may be called „profi-amateur“. Such persons were particularly active in administrative and organizational work and thus, became indispensable. It turned out that such developments were profitable for advancing from the Universities into political positions.

According to the rules of this law it was possible that some person started as a student, then in the student administration, then after graduation proceeded into the organization of assistants. After this time such a person was extremely well acquainted with knowledge about laws and regulations and therefore became absolutely indispensable. It may then happen, that the next step even without much scientific output was the advancement to professorship, deanship or then even finally, rectorship. More and more decisions depended on such a person.

SECOND PERIOD OF REFORMS

In the last few years within a short interval two new federal organization laws were imposed upon the Universities. At first the so-called UOG 93: this law brought a certain reduction of the influence of students and assistants, changes in the struc-

ture of the University offices and institutes and an augmentation of administration. The number of committees and in most of them the number of members was reduced. Together with the agreeable reduction of meetings the top-down information flow was decreased.

At the same time a reform of the curriculum was ordered by the federal University study law (UniSt.G), which is in effect since 1997. Each faculty in each Austrian University was demanded to develop their own curriculum. This had the consequence that multiple similar activities took place which led to incompatibilities between the same faculties in different Universities. In most faculties completely new changes of the organization of medical studies were introduced, like problem based learning (PBL), and a shift from former systematic teaching to so called modular courses.

At the same time the preparations for the implementation of UOG 93 took place. In Graz the so-called „tipping“ happened end of 1999. „Tipping“ described a certain stage of their preparations when the new rector took over his office.

Before the further changes and procedures due to UOG 93 were completed, again, a new organization law (UG 2002) was forced upon the Universities. This law introduced the most marked changes. When this new law went into effect, for some time two partly contradicting laws had to be obeyed.

The new law UG 2002 introduced the following demands:

All Austrian Universities receive the right to act like industrial units. They receive some basic federal budget. However, they become autonomous to administrate and distribute this budget. Furthermore, they have the permit to perform business activities. The rector receives a marked increase of power and competence. He is no more elected out of the professors or academic personnel of the University, but his position is advertised and who ever thinks to be able to fulfill the demands can apply. A complex evaluation then involves the new senate and the so-called university board. The latter consists of so called honorable persons from outside the university.

With respect to future development the international treaty GATS (General Agreement of Trade and Services) appears to threaten to permit „investors“ to become involved in University-business. It seems that as a whole the new law UG 2002 makes the Universities more and more open to influences from industry.

Again, at the same time and in fact, as the, for the university personnel, most painful addition to UG 2002, is an employment law regulating all matters of the rights of service: position, duration of position, income, rights, retirement, etc. This addition apparently, leads now to the most dangerous uncertainties for young scientists and young professors.

Last but not least the law UG 2002 orders that the three „classical Universities“ which so far contained medical faculties (Vienna, Innsbruck and Graz) had to split off these medical faculties in order to generate three new medical Universities. This „amputation“ took place on January 1st 2004.

DIFFICULTIES OF INTERPRETATION

It is most difficult to understand or even explain this event. It has something to do with the complex way to finance University hospitals, which in Austria comes from several sources. So far, the negative effects are in the foreground: partition of personnel, splitting of the library, splitting of the archive, erecting of new buildings for the new administration, new positions for the new administration.

It is not surprising that e.g. in Hungary recently the medical universities which were split off during the communist time are reunited with their mother-universities. It is, however, surprising that Austrian lawmakers recently in UG 2002 demanded the illogic reverse way.

This event is a destruction of the three historically grown universities. Two assumptions can be made as to the real reasons. It may be the old proverb: „divide et impera“ which indicates the advantage to handle two smaller units easier than one large units. The other reason is the politically motivated idea to have available a new set of high and attractive positions.

The University of Graz was founded in 1585. The medical faculty was introduced in 1863. In a book which was published 1913 on the occasion of the celebration of the 50 th anniversary of the new medical faculty, the following sentences can be found: „In these days the University of Graz celebrates together with the medical faculty an important anniversary, because only after the introduction of the medical faculty the university has gained completeness and from this completeness the rank of a fully important UNIVERSITAS LITERARUM. Until 1863 the University was only patchwork. In 1863 she became a totality.“

141 years later this totality has been lost again. We are back to be two patchworks.

Kenner T.

REFORMA A REMODELOVÁNÍ UNIVERZITY VE SROVNÁNÍ S KOMPLEXEM ŽIVÉHO SYSTÉMU

Souhrn

Živý biologický systém podléhá kontinuálnímu procesu remodelace. Krátkodobé změny a dlouhodobý evoluční vývoj je v živých biologických systémech přítomen. Proces reformy v živém sociálním systému, jako je univerzita může být zajímavým modelem pro porozumění strukturálnímu a funkčnímu remodelování.

Jako bývalý rektor a děkan lékařské fakulty jsem použil příklad Univerzity Karla Franze v Graz, abych ukázal účinky komplexního systému a souvislost reformy, jejichž výsledek je stále nejasný. Téma a jeho analýza by mohla vysvětlit některé konsekvence reformy z pohledu fyziologie: chronobiologii, etologii, psychologii a psycho-patologické fenomény podobně jako toky energie a informací. Ve speciálním případě nové zákony, které se týkají organizace univerzit, nařizovaly oddělení („amputation“) lékařské fakulty jako Lékařské univerzity, reformu studia medicíny a reformu zákona o zaměstnání. Sled událostí byl tak rychlý, že jeho účinky měly být považovány za „léčbu šokem“. Tento termín byl poprvé použit jako popis masivní ekonomické stimulace v krátkém časovém úseku v dřívějších

komunistických zemích. Ukazuje se, že přirovnání chování velkého komplexu živých systémů jako je univerzita a biologických organismů je docela instruktivní.

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