

## OPTIMISATION OF UNIVERSITY PROCESSES

*The paper will present the results of an analysis of the university processes in the context of process management. An attempt is made to identify and describe the processes realized at a university of technology and then to show their weakness, sources of inefficiency, points where they could be optimized or completely modified. The paper is based on the example of a Polish university which existed for years in a completely different political system and now has to face the inevitable changes. The aim of the analysis is to show such a way of optimizing the university processes which would make them not only more efficient, but also easier to measure and evaluate – having in view the application of Activity Based Management at Polish universities. The processes of teaching, research, university management, IT resources management, assets management, procurement and transport management, HR management and financial management are considered*

**Introduction.** Process management took its start in the 90. of the past century. It has turned out to be extremely useful, in many cases even lifesaving, for many organizations in today's turbulent environment. To make things simple, we can say ([1]) that it consists in the following steps:

- i) defining processes which take place in the organization
- ii) describing the defined processes
- iii) managing the organization by managing the processes.

The authors of [1] indicate that on one hand the process management is difficult to implement in Polish universities. There is a strong resistance against any change in management, also the structure of the Polish universities makes such changes difficult. However, the same authors describe the results of research showing clearly that the condition of Polish universities is getting worse and worse and something has to be done about it. The advantages brought by process management to business organizations show clearly that this approach to management is a chance also for Polish universities.

If a university is interested in implementing the process management, it has to start, like any other organization, by steps i) and ii). This may be a painful process. It has been performed at one of Polish universities with the help of a consulting company. Below we present some of very numerous mistakes and inconsistencies in processes' performance discovered in the process of analyzing the processes. Already in this phase, long before the proper process management is implemented, clear possibilities of optimizing the processes are visible. Some of these possibilities are difficult to put into practice, some not so. Anyway, what is most important is the awareness that certain things should be changed and the knowledge where the changes are most important.

While performing step i), at the university in question the following main processes have been identified:

- teaching process
- research process
- university management process
- marketing process
- IT management process
- assets management process
- procurement and transport process
- human resources management process
- financial management process.

While trying to describe these processes, their subprocesses have been identified, as well as numerous problems related to their performance and some possibilities of solving them. Below some of them are presented. We are convinced that most of these problems do not concern just this one university, but many Polish and generally European universities.

### **1. Teaching process**

Within the teaching process, several subprocesses can be identified. We will list some of them, those in which some improvement possibilities have been identified, and suggest ways in which they could be optimised. It has to be emphasised that such essential subprocesses as those performed by the teaching staff themselves: preparing and refreshing courses, preparing and refreshing course materials, consulting students, enhancing personal knowledge, preparing exams and tests, performing exams and test, correcting exams and tests, administrative activities connected to the teaching (e.g. preparing course curricula etc.) are very difficult to measure and assess and need further research with the active participation of the teaching staff.

a) teaching room management: the subprocess is not supported by any computer system. That is why quite often the characteristics of a room do not correspond to the requirements of the course and the teacher. Also if in some unit of the university someone needs a class room, he/she may not have access to the information which class rooms are available. The fact of the lack a computer support means also potential problem with letting the rooms for commercial use. For these reasons quite often the room capacity is not used, which means we have an expenditure without any justification/cause;

b) students enrolment for courses: the system of enrolment does not have a sufficient capacity, that is why there are problems with student lines. Also, till the very last moment is not known whether individual courses will be cancelled or not, which creates problems with planning the work load for the teaching staff and also with planning the use of class rooms;

c) discipline problems solving: many application to punish students are not well justified and often they are formally incorrect, which causes a considerable waste of time while considering them;

d) student recruitment process: we can notice a lack of marketing initiatives promoting the recruitment. In any case there is a lack of centralisation of this process, each faculty performs its own actions;

e) entering marks, preparing statistics of student achievements: they are in theory computerised, the problem is the computer program has been causing a lot of problems, both to the teaching and administrative staff. If further improvement of the computer program does not happen, this process will be still causing waste of time and many negative emotions. Apart from that, each teacher has to enter marks three times: in the computer system, by hand in the individual student card and by hand in the individual student book.

f) assigning courses to teachers: the subprocess requires that each teacher fills in by himself/herself a special form, although the same information is entered by administrative staff to the computer system;

g) PhD teaching: the computer system which is supposed to support the teaching process does not comprise PhD students for the moment. The subprocesses of their enrolment for the courses, entering marks and preparing statistics is thus more time consuming than it might be if they were integrated in the system supporting the other students teaching management;

h) introducing new specialisations: this subprocess would require more systematic market research, as sometimes the new specialisations do not really correspond to the employers' needs;

i) post diploma studies: more marketing research would be required in shaping the post diploma offer. Also, the accounting system cause delay in the access to information whether a student has paid or not. Apart from that, there is no central management of the post diploma studies: they are realised either at a special university unit for continuous education or at individual faculties, which causes some waste of time because of doubled marketing and administrative activities;

j) teaching evaluation process: there is a periodic evaluation of each member of the teaching staff by the students. However, we can notice there are hardly any consequences of this evaluation. Many members of the teaching staff also question the quality of the questions asked to the students in the evaluation form. There is also a high possibility that the evaluation results are the better the easier it is to get a credit in the respective course;

k) development of e-learning: this subprocess is present in a vestigial form.

**2. Research process.** In the research process there are also subprocesses which are difficult to measure and asses and which require more research: they cover the research activity itself, performed by the research staff: the conceptual and experimental work, the process of writing scientific papers, reports, preparation of conference presentation etc. However, even without a profound analysis of these basic subprocesses, in some of the other subprocesses of the research process at the considered university we have been able to discover some aspects in which optimization would be possible and feasible.

a) acquiring financial means for the research from various sources: about 10 %-20 % of the applications are successful. This result may regarded as not very negative, however, it can be noticed that the applications are written very often in the last moment, by teams which are not well formed research groups. In such cases the applications are successful only when they are improved and resubmitted in the following years. Many members of the research staff are not aware of how a good application should be written and that this process requires considerably more time they suspect. Especially some of them are not aware that the formal aspect counts much, as well as that it is important that the application is critically reread by several persons and corrected carefully before being submitted. More support from the part of university administration in the process of preparing applications would be advisable. It would also be advantageous to create a data base of experiences in applying for funds, for the moment it seems that the learning process in this respect is very limited;

b) use of laboratory and other research equipment: the equipment is usually bough "for someone", in the framework of some research project or with money assigned to the faculty or research group. Then it remains assigned to this "someone" and for this reason its use may not optimal, especially when the specific project has finished. There is no system of information about the availability of research equipment, nor any system of letting the equipment for external use (together, if necessary, with the laboratory staff trained in using it) among university units;

c) scientific cooperation between university units: it is very rare, most research groups are formed within one faculty, or even in a more limited way - within one institute, which a subunit of a faculty;

d) administrative activities in conducting research projects: these activities, especially in European projects, are extremely vast and are often left to the members of the research staff, who are not prepared for them, not used to this kind of work and thus often commit errors or do things in the last moment. Some of these errors refer to financial decisions. Due to an inefficient accounting information system, project managers are not able to obtain, in a given moment, the current information about the

financial status of the project. In order to have this information, they would have to run their "private" accounting, which is not quite simple, because of the overhead calculation system at the university as well as tax and exchange rates issues. The problem is that the administrative staff claims they have no time for additional work and often the possibilities to hire an administrative clerk for the project itself are limited. What is more, it has to be noticed that the university has a structure which is definitely not project oriented. It is a functional structure, which does not support project management. That is why project management activities often are performed by accidental persons, a little "by the way". It would be reasonable to introduce project management thinking and a project management office, which would take off the administrative load from the research staff. It would also enable the management of interdisciplinary projects, in which research groups from various faculties would take part;

e) nominations to project managers: often inexperienced, accidental persons are nominated to the position of research project manager. Usually what decides about the nomination is the academic degree and scientific achievement, and not the project management experience. This gives rise to problems mentioned above;

f) selling research services to the industry: there is no systematic market research as to which services exactly would be needed by the industry. That is why often the research offer formulated by the university does not fit the demand on the market. On the other hand, it is true that many industry representatives do not have the necessary will and patience to invest in long term research which may, but does not have to, be effective in several years only and to talk to the representatives of the research side, to make the effort to find a common language and to overcome initial communication problems. There are of course exceptions to this state of affairs, but generally the university is not perceived as a good source of real world inventions and solutions;

g) dividing internal funds for research: as each unit is free as to the criteria how to divide the funds between various research groups, there are complaints that the distribution of these funds lacks objectivity;

h) concluding agreement with other universities about scientific cooperation (usually for the sake of a common application for project funds) – this process is too complicated already in the initial step, that of expressing a will (without any obligation) to cooperate. Already in this stage a number of signatures is necessary, which often causes such (unexpected by the research staff members) delays that the deadlines cannot be met and the idea is given up;

**3. Other processes.** In this section we will present the other processes identified at the university in question. Let us start with the university management process. The management of the university is composed of a number of subprocesses, the analysis of which sometimes requires the access to the top management of the university. Unfortunately, this access, partially for time reasons, was not completely guaranteed. That is why the below analysis is limited to the subprocesses which can be observed from the position of one of the professors of the university.

a) protection of intellectual property worked out in the research process: this protection is not quite efficient, especially with respect to other universities. Many persons are employed at other universities too and share sometimes without any control the scientific results with them. For each publication the author has to decide which affiliation he/she wants to combine it with, each publication is also linked to one specific project. Nevertheless, some scientific results are used in several publications (as a reference point, for comparison etc), thus the problem of intellectual property protection is not completely solved;

b) designing future syllabus offer of the university: this subprocess is not sufficiently based on the analysis of the needs in the region, of local employers, of forecast developments in economy and demography;

c) implementation of strategy: as such modern management tools as balanced scorecard are not implemented (although proposals for it exist, e.g. [2]), it is difficult to link actions performed to specific strategic goals and measures;

d) planning: planning is still based not on tasks, but on the functional budget, linked to functional units and cost types, which makes it difficult to find a cause effect relationship between what is done and the cost;

e) costing system and controlling: no modern costing methods are implemented, like activity based costing, target costing (again, although at least partial proposals exist ([3,4]), that is why the costing information is not clearly linked to strategic goals and causes of cost incurring. The costing system used is rather function oriented. And in order to be really efficient and useful, it should be more project and process oriented. Also no coherent controlling system is implemented;

f) forming offers of training for customers from the industry: the offer of post diploma studies is rather poor. At the same time, the teachers employed at the university teach in post diploma programs at other universities in the same city, sometimes they even hold the function of the director of those studies. It would advantageous to find a way to attract these teachers to work at their principal employment place;

g) the management itself: as mentioned above, the management of the university is not project oriented, but function oriented;

h) defining administration jobs: this subprocess should be more formalized, because for the moment the jobs are not coherently (among various university units) described, both with respect to the duties of the person employed to do the job and with respect to the necessary equipment. That is why a part of employees seem to be overloaded and/or not sufficiently equipped with respect to others, while the jobs/the positions they hold are equivalent. The fact that some persons are overloaded may be one of the reason of a high turnover in some positions;

i) communication: the is the Intranet facility which should play a crucial role in the communication within the university, also the email addresses are easy to remember and identify, as their system is clear and coherent. However, still very often, also in urgent and important issues, the paper post is use. This, in view of the fact that the researchers of some faculties are not every day at their work place (they work in other universities, in the branches of the university which exist in other towns or at home, using Internet), makes the communication difficult. Also not all decisions or regulations published by the university management are published in the Intranet, often, they exist only in the hard form.

The next process to be analysed is the marketing process. Here the following problems or inefficiencies which have been identified:

a) distribution of documents and gadgets promoting the university: an outsider, e.g. a high school representative, would have problems to get them free;

b) presentation of the teaching offer: the teaching offer is presented by individual faculties almost independently, a more coherent and centralized approach would be advisable. This would also enable more interdisciplinary offer, which might be of interest to many candidates;

c) promotion of the university: this subprocess should be enforced, in view of the consequences of the baby bust. The quality of the teaching and research staff should be emphasized as well as the attractiveness of the teaching offer, as seen from various points of view: that of future industry employment possibilities, but also that of a talented student, planning a research carrier;

d) commercialization of research results: this process should be more supported, which partially has been started by trainings and post diploma studies for researchers devoted to this topic. However, the researchers need here further assistance, especially of the marketing and sales type: market research, publicity, negotiations etc.

e) promotion of services that can be rendered by the university: the university, apart from the research, can offer paid services, thanks to the equipment it possesses and the qualified staff. However, a systematic marketing and sales support in this aspect is needed.

In what follows we will look at the IT management process. To start with, it has to be noticed that the university in question has been implementing a computer system of students' service, which after many problems does function, although with some difficulties, at several faculties, however at the other ones it does not. The goal is to introduce it everywhere, but it seems that it stills requires improvement. Some special functionalities needed at some faculties are not present in the system. The good thing is that the system was made extra for the university in question, thus the authors are available to modify it as far as it is possible. It is also important to say that the university has been looking for a suitable accounting and controlling system, but it has been difficult, as all the offers have had some drawbacks, some functionalities were not comprised. Finally it has been decided to buy a half-ready system, which will have to be adopted to the needs of the university, but of course this will have to take time. In the meantime a very old accounting system is used, in which many functionalities are not available and the necessary operations have to be performed manually.

In the IT management process subprocesses, the following drawbacks and improvement possibilities can be noticed:

a) registering and decision making as to purchases of software licenses and hardware: as this subprocess is not performed at the central level, the needs of the users are not well identified, there are often double purchases, while in other places money is missing for some necessary software or hardware;

b) purchases of software for the use of the administration: this subprocess is not performed centrally, either. That is why some of the software used by administration was made by small companies, very often whose founders are research workers of the university, which means in some cases lack of integration, missing documentation and the use of different, sometimes old techniques, which makes any integration impossible. The bad thing is also that such companies sometimes cease to exist, the persons who made the software change their work place and then, because of a deficient documentation, all the problems connected to the software remain unsolved and usually a new software has to be sought for;

c) computer support of the university management: this subprocess is not integrated, there is no integrated computer system for the whole management of the university. This may be due of the lack of such systems on the market.

In the following, we will take a closer look at the process of assets management. Assets comprise grounds, buildings etc, but also mobile assets: machines, apparatus etc. It has to be said that the process is not integrated on the highest level. The procedures used are not coherent and the knowledge about assets management is dispersed all over the university. Decisions about new purchases are made locally, without knowing whether somewhere else at the university the needed asset is not available. As far as the drawbacks in the subprocesses are concerned, we have to emphasise the following problems:

a) computerized assets management: there is no integrated information system about the assets being at the disposal or planned to be bought by the university;

b) analysis of the actual use of assets: such analysis is almost non-existent. This may lead to multiple purchase of the same asset type;

c) assets registering: as it is done to a high degree by hand and by various individuals, dispersed all over the university, the moment when one of these persons gets retired or changes the job, a part of the information is lost;

d) buildings investments and renovations: there is no integrated management system of these projects, which would cover all the project phases – from initialization through planning till the project closure.

The next process to be analyzed is the procurement and transport process. Here the following subprocesses need improvement:

a) inventory management: there is no integrated computer system supporting the subprocess, the work is done to a high degree by hand;

b) the purchase procedure: each purchase requires a number of forms to be filled in and signed by several persons, which makes the procedure very long and evokes negative emotions;

c) purchase of inventory of low value: for such purchases a simplified procedure should exist, however, for the moment also such purchases require a long and complicated way to be followed;

The next process to be looked at is the human resources management process, and more exactly its selected subprocesses:

a) evaluation of research workers and teachers: there are clear criteria according to which a periodic evaluation takes place, however, these criteria are criticized by many persons, for not being adopted to the individual character of the research field: e.g. in some fields there are by nature more possibilities to publish in international journals than in others, but the researchers in both fields are compared to each other according to identical criteria. An example would be computer science, which is naturally more international, versus sociology, where local specific problems may be of less interest to the world academic audience;

b) making research workers redundant: this subprocess is difficult due to law regulations. The first negative evaluation cannot lead to the person in question losing his/her job. The negative evaluation has to happen again, and as the evaluations are repeated every four or at the most every two years, even people who do not do any research at all are very difficult to get rid of;

c) job description and evaluation: individual jobs are not described and evaluated in a standardized way, which may lead to tensions and conflicts;

d) actual work registering: this has to be done in a paper form for European projects and also in paper for the hours planned to be taught and then the hours actually taught by each teacher;

e) employment planning: this subprocess is very difficult to perform efficiently. For one thing, the budgeting is done on a calendar year basis, while the teaching needs are planned (and known) for individual academic years. What is more, it is not known when which research projects will be realized nor how many candidates apply for individual faculties. Also, the teaching planning is often linked to small research teams and these teams are not always willing to share “their” teaching hours with other teams – even if there is no problem of a competence lack. That is why some teachers have problems to get the appropriate number of hours to teach while others have a huge number of overtime hours;

f) human resources management computer support: there are three different, not integrated systems used in this area and the shared information often has to be entered manually.

The last process to be viewed is the financial management process. This process is in many ways linked to some processes described above (to the procurement management process, the assets management process, the university management process), and it suffers from the lack of integrated computer support indicated in those processes. The inventory and assets purchased are registered more than once in different systems and places. The bookkeeping and financial reporting is very time

consuming, because it has to be performed to a considerable degree manually. The computer system used at the moment for accounting and finance is old and lacks many necessary functionalities. It is not integrated with the systems supporting the salaries management. As far as the subprocesses are concerned, they are heavily influenced by the imperfections of the computer system. The following subprocesses have to be emphasized:

a) budgeting and controlling: no modern methods of budgeting are used (like activity based budgeting). Also, the system used for the moment does not support efficient financial controlling for the university as a whole and for individual units;

b) cost allocation: the cost allocation is not based on the activity based costing, but on simple, imposed overhead rates, which causes problems in evaluating different units of the university, but especially in reporting the European project realization, where cost allocated to the project more and more often has to be justified in an exact manner;

c) foreign exchange operations: as the old accounting system does not support them, they have to be done manually, which in view of their increasing number causes a lot of time problems.

**4. Conclusions.** The title "Conclusion" can only refer to this paper, but it is completely inadequate to the whole process of implementing process management at the university in question and generally at universities. In this paper we present selected results of the very beginning of this implementation: of the processes' description. The structure of Polish universities, their history, fixed habits and ways of thinking, as well as financial problems make it difficult to introduce deep changes in their management, but their situation shows that some profound changes are necessary. An initial analysis of the processes performed at the universities shows directions where these changes should be focused. Although the paper is based on one Polish university, we think that most of the problems noticed there apply not only to many Polish universities, but also to many European ones.

If the problems linked to university processes and the processes' optimization possibilities discovered so far were to be summarized in one sentence, we would formulate it as follows: the universities need integration and integrated computer systems supporting all the processes. Otherwise the same activities are performed several times, often manually, and knowledge present in the university does not reach the persons who need it, because one computer system is not integrated with another one. But the integrated computer systems have to be good. Good for the universities. Those made for business organizations do not fulfill the university needs. It is very difficult to obtain (have made) a good university management system. Maybe for the moment it is even impossible? This seems to be a challenge for IT companies. What is more, no computer system will help if the processes performed at the university are not clearly defined and optimized. And this is a very hard work. However, the situation of European universities seems to suggest that there is no other way than to face today's challenges...

#### REFERENCES:

1. *Greber T., Kubiński P.* (2010), Process approach in university management (in Polish, to be published), Proceedings of a conference "Process management", Politechnika Wroclawska 2010.

2. *Josek W.* (2008), Balanced Scorecard in university management (in Polish), PhD thesis, Politechnika Wroclawska 2008.

3. *Klaus-Rosińska A.* (2009), A method of Activity Based Costing in the university (in Polish), PhD thesis, Politechnika Wroclawska 2009.

4. *Kowalski M.* (2007), Managing the cost information on the cost object level in the Activity Based Costing, (in Polish), PhD thesis, Politechnika Wroclawska 2007.