

Business Process Management as a support for e-learning development in Poland

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Abstract: *Polish model of higher education is to be an open system of education with latest technological solutions, which should enhance efficiency, quality and cost-effectiveness. Modern educational technologies include mainly e-learning platforms. This paper presents the new world-wide trends in contemporary e-learning in comparison to Polish e-education and its condition. The authors suggest also the Business Process Management as a solution to support development of Polish e-learning.*

Key words: process management, educational organization, e-learning development trends

1. WHY E-LEARNING?

E-Learning proves to be a perfect tool to achieve expected goals in a short time span. Continuous education with on-line learning is an advantage mainly because it aids succession planning, helping workers/students to acquire the knowledge and skills they need with low cost incurred.

There are 7 key e-learning trends for 2016.

Automation

Automation will finally become a key feature of content creation and processing. An increasing number of automated solutions appear on the market to create new courses and learning materials, saving the time and money. These tools will scan the course content and recognize its most important aspects that should be tested involved in conventional processes. Courses, tests, quizzes and exercises will all be tailored to the preferences and requirements of every single user. The skills and knowledge will be assessed by automated tools that will in turn offer algorithmic solutions used in creating course content.

Augmented learning adapts environment to a learner by means of QR codes or mobile technologies like Apple Watch or Google Glass. Learners can be placed in a replica of their work space, or a modeled 3D environment, with content pop-ups and features superimposed. This action-based functionalities in real life will be conducted by means of GPS tracking, as well as with courses developed by Oculus Rift.

Big Data

The amount of data is growing year by year. E-learning centers will use application made especially for big data processing to make sense of the user-generated information. These tools will analyze a heap of data to produce meaningful and valuable conclusions about user performance or course content optimization. Big data analytics will aid better understanding of the learning process itself. Course providers will be able to track student and group learning patterns and performance feedback analysis. These tools will be extremely useful to compile a comprehensive ROI report for learning.

Cloud Based LMS will dominate the market as they are secure, with low initial costs, easily accessible from anywhere and anytime. Moreover, they do not require storage space on users' devices and are fully customizable and scalable.

Gamification

A mass of facts and information and various stimuli distract learners, make impossible to concentrate on one thing. It requires a lot of effort to keep students engaged in a state of "flow" – a phase of concentration. One of an effective motivator is a prize, even a small one (Piękoś 2015). It has been proved that applying game dynamics onto non-gaming contexts brings really great results as it motivates people to achieve their goals. This new problem-solving tool can be easily applied to learning. Gamification offers a potential strategy for improving user engagement with learning materials – some experts claim that the technique can boost learner's motivation to a smashing 90% recall rate. It's quite simple. Once learners assume an active role in knowledge reception, they will automatically improve their chances at remembering it.

Communication and Collaboration are two essential processes to foster relationships among students and between students and teachers. The 500 student lecture hall is just as ineffective as the 500 student online course. Only a small percentage of students can successfully complete a MOOC.

M-learning - is likely to become more and more attractive by **compliance** and both **regulatory and general topics**. It is mobile, informal, and performance support type learning. Using mLearning technologies learners will benefit from contextual learning achieved through micro-location technologies (like QR codes, GPS and other) that will also allow for a much better use of augmented reality.

Figure 1 illustrates the types of technologies applied in e-learning, and what might be referred to as a unified collaboration environment for distance education and e-

Learning. The “unification process” is only just underway, and will continue to evolve for years to come.

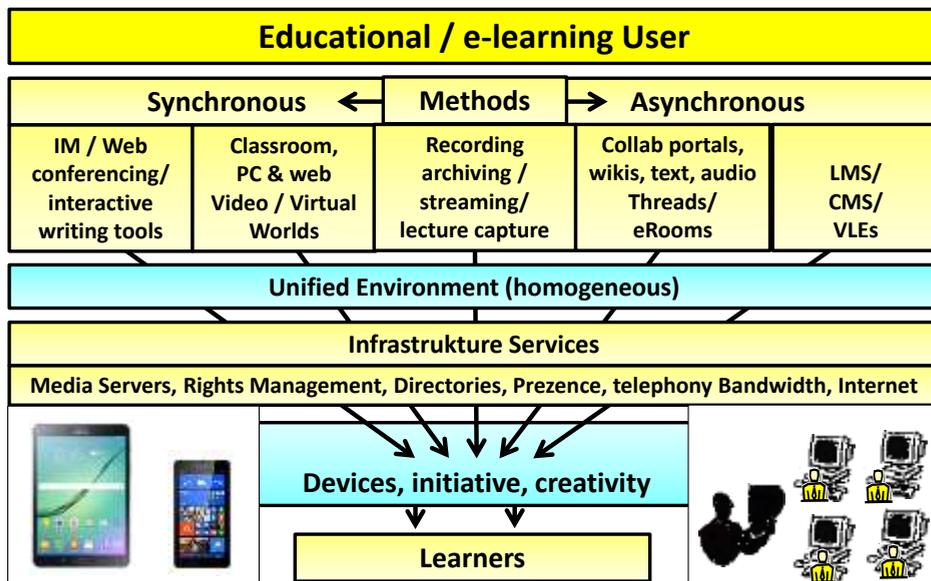


Figure 1. Unified Collaboration Environment for Distance Education & e-Learning

Source: Elaborated on the basis of The Distance Education and e-Learning Landscape. Wainhouse Research Segment Report 2009, USA.

Personalization will be all about adjusting the pace of instruction, motivating students, letting them to follow their own learning path and adjusting content presentation with a better choice of text, images or videos. The features that will make personalized e-learning even more attractive are:

Adaptive learning will be even more popular in the academic sector for its capability to improve overall learner performance and prevent failure and drop out. Adaptive platforms not only record marks and learning achievements, but measure metrics such as time spent in aligned social media environments, attendance at lectures, and work submission patterns.

User generated content - learners, at any level, are ready to start creating and share their own content following the same training path that they have passively followed till now. It is going to be really effective in the environment of significantly growing **social learning and mobile learning**, especially in combination.

Interactive video - the increase in people using video. New solutions allow users to host, serve, secure and track their learning video globally at a reasonable cost and quality.

Badges, particularly Open Badges, are a breakthrough in the education market as they play a role in supporting and rewarding learners. They will boost learners' desire to manage and publish their own digital credentials and achievements in social media (Sikora, L., UNIT4 Software Engineering).

E-learning is not a matter of coincidence. E-learning should be intentional on the part of the university or organization that implements it or it will not work. Students' success depends on it.

This projections for year 2016 about development of e-learning in the world are prepared by Docebo company. *The Report by Docebo March 2014* presents new technologies for e-learning, their functions and how rapidly they develop. Yet, Polish universities and schools of higher education still talk more about the barriers to implementation or development of e-learning systems rather than positive perspective and successful, profitable activity.

1. CONDITIONS FOR E-LEARNING DEVELOPMENT IN POLISH UNIVERSITIES AND SCHOOLS OF HIGHER EDUCATION.

Theory and practice of e-learning in Polish universities is built up mainly on a basis of publications and conference presentations. There is still a lack of systematic, fully available information about the scale and forms of e-learning activity. To cover this gap, Association of Academic E-learning (SEA) was founded to create e-learning databases for Polish universities. The aim is to: collect and popularize information about e-learning activities, compile reports and perform an analysis of Polish high education and popularize using new IT technologies in the learning process (SEA).

Two leading Polish universities successfully implemented their original models of using IT technology for learning: University of Economics E-learning Centre in Cracow (CeL) and Centre of Open and Multimedia Education in Warsaw University (COME) (Dąbrowski, Zajac 2010). The achievements and findings of the experts from these universities may serve as a guidance for others to change a status quo.

Universities aim at providing interdisciplinary not only specialist and professional education, so they are forced to take some actions: extend the educational offer, make education more available and interdisciplinary, flexible and of better quality. To make these ideas realistic they implemented new IT technologies and created their original e-learning models.

COME – an interdepartmental unit in Warsaw University (UW) is responsible for popularization of new educational forms. Its Interdisciplinary Database of Academic Courses (IBIZA) offers e-courses on subjects and disciplines other than currently studied ones, e.g.: *Mathematics for humanists, The introduction to macro and microeconomics, Law for non-lawyers, Elements of Excel.*

The offer includes also:

- language-courses – replacing traditional courses. There are about 100 virtual groups in a semester, mainly for English, but also a few for German, Russian, Croatian, and Czech. The courses are run with a blended-learning method,
- regular courses which support traditional learning
- training courses for first-year students: compulsory Industrial safety course and Library course (*Virtual University 2015*).

COME coordinates also projects, research and analysis on needs, developing e-learning methodology and curriculum. The partners are Jagiellonian University, Warsaw Technical University.

Initiators of e-UEK (E-learning Centre of the University of Economics in Cracow) projects followed five principles:

- principle of equal rights of e-learning and traditional learning methods,
- principle of coherence of e-learning system, which implies defining some rules to include e-courses in a regular curriculum, creating a catalog of approved forms and methods to calculate working hours for teachers,
- principle of professional and systemic actions, which means any e-learning initiative is performed as a project with defined goals, priorities and actions and evaluated according to defined methodology of quality management,
- principle of quality, i.e. e-learning projects should meet university quality standards,
- principle of central project management, i.e. that any university project is coordinated and completed by a special unit – The Centre of e-Learning (CeL).

The E-learning Centre of the University of Economics in Cracow provides:

- support for learning units in University of Economics in Cracow with systemic and systematic course planning and organization,
- training courses for teachers on preparing and running courses on the Internet,
- support teachers with preparing e-teaching materials,
- support students participating in e-courses.

The Centre also:

- administers the UEK e-platform,
- creates new and developing existing applications,
- promotes new teaching forms applying multimedia,

- participates in European e-learning projects,
- conducts research on methodology of designing and running e-courses, manage-learning projects and also performs the ROI analysis.

Their achievements and experience helped the experts in both academic e-centers formulate the following findings:

- although e-learning won its position in UW (as it is included in the process of problem-solving), is still marginal element in teaching process itself,
- specific isolation of university departments thwarts the university efforts to provide interdisciplinary education and constitute a serious barrier to promote changes suggested by the center,
- implementation of e-learning system in universities is a slow, long process which should be performed gradually,
- e-learning will be a crucial element of an education system if introduced thoughtfully to solve defined problems typical of a given university. Then, people will understand the need for change and will approve and appreciate this new way of organizing and teaching .

These findings are supported by UEK experts, who claim that the university will benefit from changing the model of education if all actions will be based on the coherent rules or “pillars of good academy”: perspective legislative policy, codification of flexible types and forms of e-courses, effective quality evaluation system, system of support for teachers and students and research and development of e-education. These pillars implies also coherent academic culture, support, high educational standards, e-course certification (assigning responsibilities to teachers, and managers), promoting positive approach to technology, creating mechanism to prevent misuse and treating e-learning as an excuse for lower teaching standards (ethical issues).

Experts in both universities unanimously emphasize that successful implementation of e-learning depends on professional and in-depth organizational changes in the whole university which will guarantee free co-operation, co-existence and merge of both teaching models: traditional and distance.

One of the reasons for which organizational changes appear to be a top priority is that implementing efficient e-learning model is a complex process which requires co-operation of experts at many fields. This is reflected by the structure of E-learning centre:

- Manager of the Centre (a plenipotentiary of Rector),
- Team for E-process management,
- Team for E-learning methodology,
- Team for E-learning technology,

- The Policy Council supervises professional performance of projects (SEA).

Preparation of e-learning project requires the team of different experts to cooperate: an author of content, methodology expert, graphic designer, language proofreader, reader, IT specialist, programmer, tester.

Conditions of e-learning development in private schools of higher education.

On the basis of observations and experience, the authors may summarize the conditions of e-learning systems in private schools of higher education as following:

- Ineffective spending of EU funds assigned for e-learning development,
- lack of financial means, human resources and tools to create project teams,
- Lack of organizational integration – management barriers,
- Lack of motivation and strategy of e-learning development also because of generally poor performance of schools.

3. BUSINESS PROCESS MANAGEMENT – A SOLUTION TO SUPPORT E-LEARNING

The analysis of achievements and performance of e-learning centers indicates the areas for improvements but also the needs of Polish universities in general. The solution which would meet the needs and foster implementation and development of e-learning system is *Business Process management (BPM)*.

“Business Process Management (BPM) is a discipline involving any combination of modeling, automation, execution, control, measurement and optimization of business activity flows, in support of enterprise goals, spanning systems, employees, customers and partners within and beyond the enterprise boundaries.(Palmer 2015)”

The following analysis should provide a better insight into BPM:

- BPM is a discipline; it is a practice; it is something you do.
- Business means commercially viable and profitable work which provides value to customers.
- Process means a flow of business activities which are connected toward the achievement of some business transaction. Flow may be loose: the order may or may not be strictly defined.
- A process should be considered at the scope of interrelated business activities which holistically cooperate to fulfill a business objective. This is the key difference from a functional view of business where each function might be optimized independent of the other functions. In a complex system like an organization (university), local optimization of a part of the system will rarely

lead to good overall results. A BPM practitioner should consider the metrics of the entire system while evaluating a specific process.

The Figure presents the difference in structure of functional “fragmented” organization and a holistic process organization.

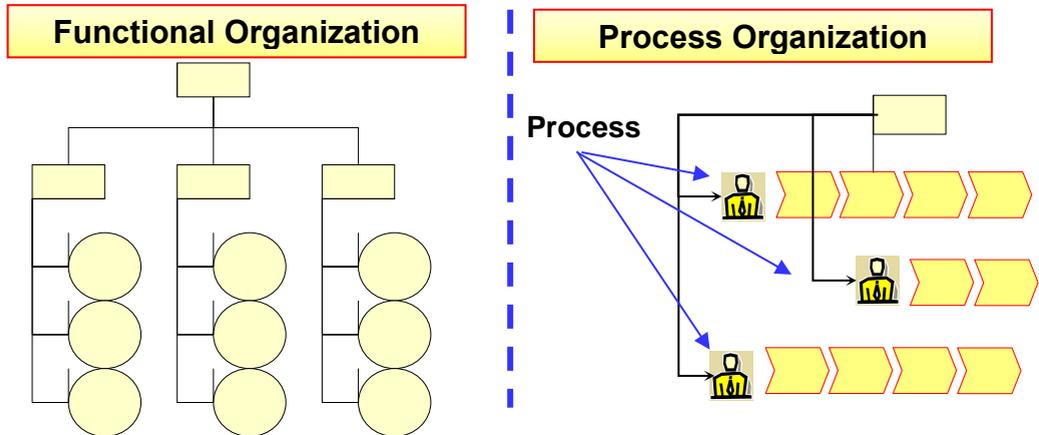


Figure 2. The structures of functional” organization and a process organization.

Source: Elaborated on the basis of J.Kuck, 2013, p.68, *Nowoczesne technologie w logistyce*, AON, Warszawa 2013.

Another valuable clue Nathaniel Palmer gives is that *BPM is about improving processes* - the idea behind is that you view business as a set of processes, and BPM is the act of improving those processes.

An enterprise-wide *BPM* initiative has three “tiers”.

Tier 1 - Process Understanding

Processes with a focus on the core processes are documented according to a Using a process framework. Creating a central repository is another ingredient at this level.

Tier 2 - Process Improvement

In terms of improvement, here is where a formal methodology may be applied. This level is about team working in workshops to dissect their business processes, identify inefficiencies, then recommend and implement process improvements.

Tier 3 - Process Automation/Optimization

Once a method for improvement has been established and improvements applied, a subset of processes can benefit from technology and various applications. Workflow can enforce the processes performance. Process monitoring can track and audit work

and provide insights to process problems. Automation can eliminate activities performed by people as well as eliminate human mistakes.

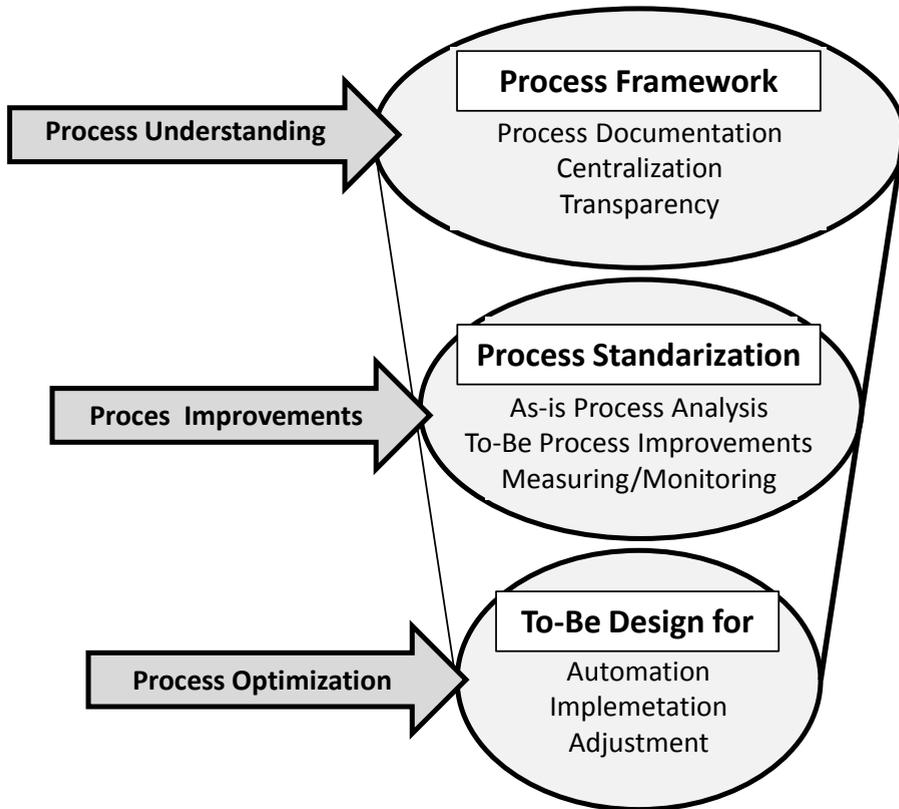


Figure 3. Comprehensive Approach to business Processes

Source: Elaborated on the basis of BPM Methodology. Practical Guidance. http://www.what-is-bpm.com/get_started/bpm_methodology.html (accessed 23 August 2015)

The most important advantages of process improvement in an organization are:

- a) copying the current processes and the structure of their connections
- b) presenting logical and time connections of activities in a process, facilitating identification of the following limitations:
 - lack of data integration
 - lack of processes integration

- time extended single-minute exchange of die (SMED) for some functions, transport, data processing;
 - lack of transparency and effectiveness of processes
 - repetition of the same functions in a process,
 - too much of feedback
 - excessive costs
 - partial responsibility of people for the whole process,
 - too many functions creating no value,
 - too much time in a process, which does not influence value creation
 - too many changes of organizational units within one process.
- c) Assigning other functions of the process to positions or people responsible for a given function;
- d) Designing the system for measuring the process effectiveness;
- e) Defining what information should be transformed in a process and what information should be received after completion of a process;
- f) Developing interfaces for other processes, i.e. connections with other processes. It is essential to define time needed to transfer a given result of this process to a client or to connect together partial models built on different levels of detail. IT tools facilitate fluent navigation between different models of processes, which is not possible with traditional paper documents (Kuck2013).

Processes in a university

For BPM implementation needs, university should be understood as an educational organization.

Organization (also educational organization) is a system consisting of five basic interrelated elements: objectives, knowledge, people, structure and resources (Tomaszewski 2014). It is an open system with the specific environment which influences this organization. The Figure below illustrates the elements of the organization.

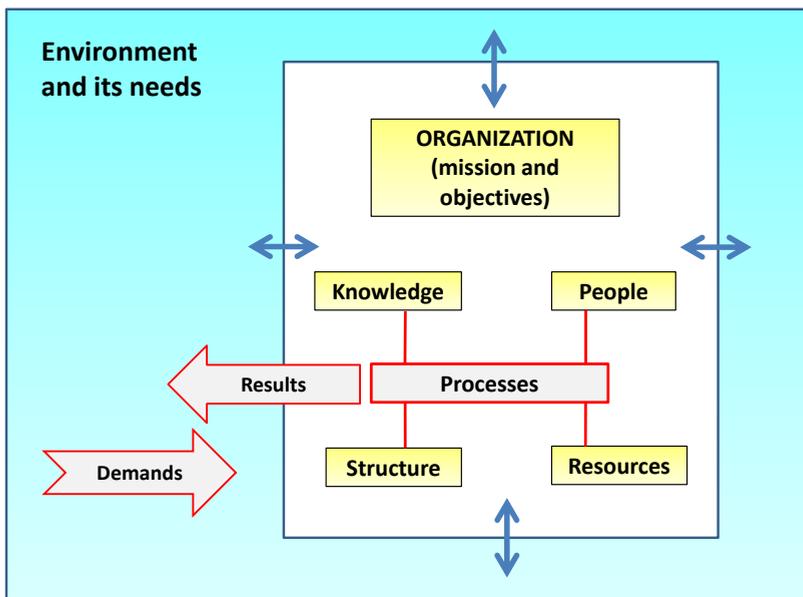


Figure 4. Organization and business environment.

Source: Elaborated on the basis of A. Tomaszewski, 2014, p. 48, Organizacje publiczne i ich otoczenie [w] red. S. Sirko, 2014, Zarządzanie organizacjami publicznymi, AON, Warszawa 2014.

To define the idea of process, first its elements should be explained.

Activity – is a key element of a process. George Hostelet (1960, p. 56), the leading praxiologist explains that act reasonably means changing reality more or less consciously, pursuing a defined goal in specific conditions, using resources to reach the condition suitable for a defined goal.

Max Weber claims that “...in ‘action’ is included all human behavior. He emphasized the difference between this minimally meaningful conventional action and innovative action, Weber analyzed the sense, or meaning, of human action at many levels, three of which may be considered basic, The three levels have to do, respectively, with the components of material interest, feelings of affinity, and authority in social relationships.

Process

Michael Porter defines a process as the value chain. The idea of organization as a system, made up of subsystems each with inputs, transformation processes and outputs. Inputs, transformation processes, and outputs involve the acquisition and consumption of resources - money, labour, materials, equipment, buildings, land,

administration and management. How value chain activities are carried out determines costs and affects profits (Porter 1985).

ISO 9000:2000 standard definition is: a process uses resources to transform inputs into outputs. In every case, inputs are turned into outputs because some kind of work, activity, or function is carried out. Processes can be administrative, industrial, agricultural, governmental, chemical, mechanical, electrical, and so on.

A *process* is a sequence of interdependent and linked procedures which begin and end, they have clearly defined inputs as well as the end result. In other words, a process is a series of defined actions that lead to a particular result. A business process, designed to reach goals defined by an organization, institution or company, involves connections between suppliers, clients and other entities, business partners, etc. A single change in a business process is a function. Decomposition of a function transforms the function into a sub-process. With the equal access to resources, technologies and suppliers, organizations compete through efficiency of processes. Measures of process efficiency are: time, cost and quality of the result provided to a client (Kuck 2015).

Richard Boulton and Barry Libert claim that processes constitute a real functioning of an organization: they are a sequence of operations, methods, tasks and functions that produce some goods or services¹. Figure 5 presents the hierarchy of elements in a process.

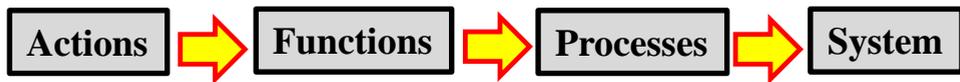


Figure 5. Hierarchy of Elements in a Process.

Source: Elaborated on the basis of B. Badirui B. Ayeni, [In] Skrzypek, M. Hofman, 2010, p.35, Zarządzanie procesami w przedsiębiorstwie, Oficyna a Wolters Kluwer business, Warszawa 2010.

Main characteristics of the process are:

- process is a set of actions
- process is ordered, i.e. actions are performed in a specific order,
- actions in a process should lead to the result.

The needs of a particular organization determine the number and nature of processes. There are three different types of business processes:

- core processes (also called primary, essential, operational processes)
- support processes, designed to provide support for primary processes, and performed within an organization

- system processes (management) support and improve the whole management system in an organization.

Core processes often called main processes, are composed of actions, decisions, information and materials taken together. They have the biggest influence on organization performance and (for a company) its competitive position on the market. Core processes create value, have a strategic meaning, and run through many departments connecting suppliers with the clients. Support processes do not have any strategic meaning and should be clearly separated from the primary ones. They can be accomplished effectively by outer companies (Kuck 2013).

The literature provides a variety of classifications of processes:

- operational, support (Brilman. J., 2002);
- mega processes, main processes and sub processes (Zimniewicz, K., 2003);
- operating processes (main), support processes (American Productivity & Quality Center).

(Kreuz 1996) categorizes processes into four types:

- key processes ensure the success of an organization, institution or a company by emphasis on high quality of a product or service oriented towards competitors;
- “leverage” processes that recognize time, costs and quality and optimize them;
- opportunistic processes deal with different approach to clients, promoting those with whom cooperation generates best profits;
- supporting processes support the key processes, should maximize effectiveness and eliminate redundant work.

The processes may also be divided by:

- a) decision-making positions:
 - managing (system) processes,
 - executive processes;
- b) importance for an organization:
 - strategic processes,
 - operational processes;
- c) submission:
 - main processes,
 - minor processes.

The processes to be effective should be performed by aware workers who undergo proper training and change the way of thinking and perceiving of organization and its functioning. Organizational culture and holistic way of thinking are crucial. Concentration on speed, efficiency and correctness without understanding the meaning of actions is a perfect recipe for a potential disaster. Objective – based management should prevent this disaster.

System of processes in an organization is a set of interrelated processes. Some obstacles and disturbances on the verges of processes decrease the efficiency of the whole system

The whole system may be characterized as follows:

- system of processes is artificial – it is created to accomplish a specific goal,
- system of processes is coherent – change of one element may trigger change in other elements
- system of processes is open – the environment influences the system,
- System of processes is complex – its structure comprises: a subsystem of goals, a subsystem of measures, a subsystem of process owner’s responsibilities. These subsystems are interrelated.

Considering specific activity of a university (educational organization) the following processes were defined: main – student-oriented processes, supportive processes and management processes.

Table 1.

Processes in an Educational Organization

Research and Development Process	Goals	Structure
International cooperation	Exchange information, knowledge and experience	Research projects Conferences, seminars Publications Students Exchange programs
Business contacts	Cooperation Exchange information, knowledge and experience Licences and copyrights for research results Development of practical	R&D cooperation Research projects Implementation of innovations E-courses for business sector

education

Mobility of staff

Teachingprocess	Goals	Structure
Teaching	Preparation and realization of a teaching process for Bachelor's and Master 's studies. Teaching skills and providing knowledge appreciated by future employers	Developing a student's profile Planning studies (educational offer) Planning a semester Teaching Planning training/apprenticeship Evaluation
Language competence	Preparation, performance and evaluation of language courses	Placement test Completing and evaluating courses Evaluating language skills of students
E-learning	Preparation, performance and evaluation of e-learning courses	Accepting an order Creating a project team Preparation of e-courses Implementation Evaluation
Employmentguidance	Providing guidance to a student in finding the first job	Trainings about employment market Writing CV and preparation to a job interview

Supportive processes	Goals	Structure
Recruitment	Organization and completion of recruitment	<p>Defining requirements</p> <p>Completing recruitment process</p> <p>Providing efficient service for candidates</p> <p>Announcing the results of recruitment process on time</p>
Organization of studies	<p>Organizing studies, ensuring efficient teaching process completion</p> <p>Preparing documentation of the process</p>	<p>Preparing documents of studies</p> <p>Planning and organizing courses schedule</p> <p>Making decisions about grants</p> <p>Providing teachers and students service</p> <p>Monitoring and controlling full completion of courses</p> <p>Monitoring financial means</p>
Administration	Providing and maintaining equipment and resources	<p>Maintaining infrastructure, resources, accommodation, transport</p> <p>Office work</p>
IT service	Providing and maintaining application and IT tools for teachers and students	Providing service of IT systems, completing documentation, creating new applications
Human resources	Monitoring vacancies and employees' qualifications	<p>Staff recruitment</p> <p>Adapting and training new employees</p> <p>Evaluating their performance</p> <p>Monitoring experience and professional development of employees</p>

Library	Providing and expanding library book collections	Round o'clock access to the library catalog Monitoring number of titles Informing about new publications Short time of order-completion Cooperation with other libraries
Accountancy and finance	Controlling financial means	Controlling grants, funds Controlling spendings on conferences, courses, projects Controlling current expenditures
Analysis	Defining standards of quality for teaching process, level of students and teachers' service.	Statistical analysis Providing analyzed and reliable data about needs and requirements of university clients.

Managing processes	Goals	Structure
Monitoring Quality system management	Controlling documentation, monitoring and optimizing processes	Controlling documentation Audit Controlling faulty products/service
Managing the university	Efficient decision-making processes Defining strategy and goals Correcting mistakes in decision processes by continuous improvement	Supervision and controlling by top-management board Decision-making Prevention and correction of mistakes

Source: Own work

Public organization management still adapts functional-process solutions, where departments play a key role in organization and employees' minds. Figure 6 presents the main teaching process and Figure e-learning process in a functional-process organization.

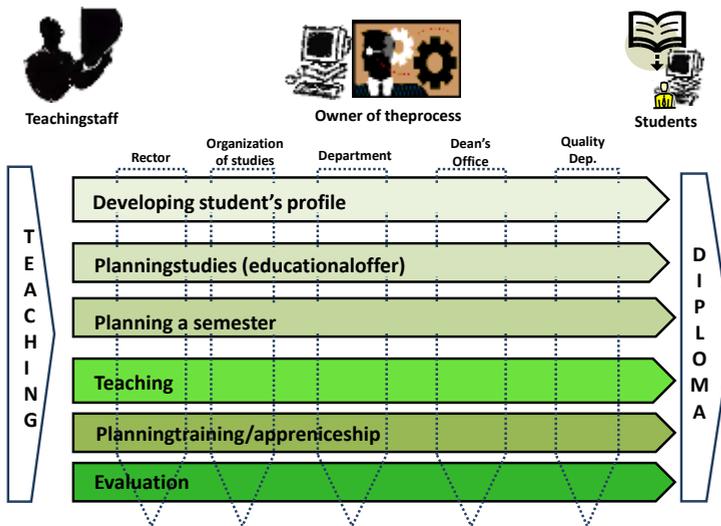


Figure 6. Teaching process in a functional-process organization.

Source: Own work

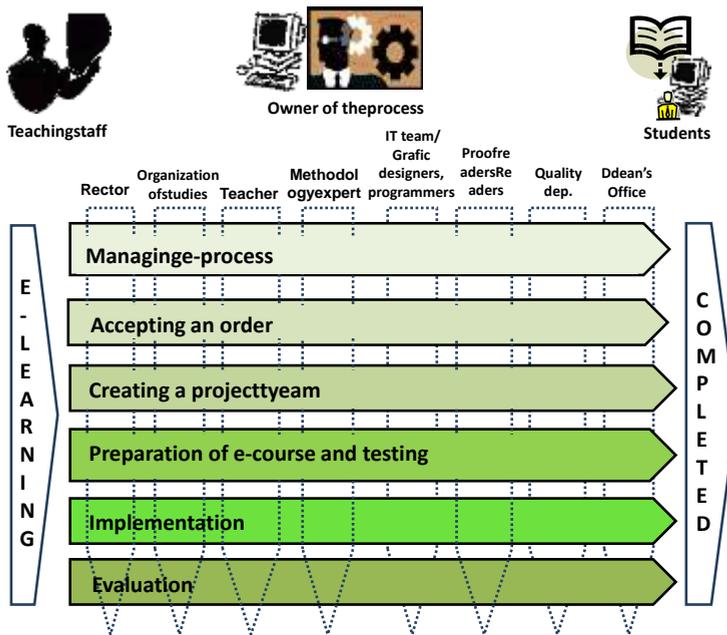


Figure 7. E-learning process in a functional-process organization.

Source: Own work

This functional-process model of organization will be evolving in time to the model of process organization as presented in Figure 2 above.

CONCLUSION

The presented analysis of conditions for e-learning development in Polish universities leads to the conclusion that the model of process organization (BPM) meets requirements of contemporary university- educational organization. *Business Process Management* offers gradual implementation or reorganization of the educational system to provide any possible selection of teaching methods and project teams for meeting students needs. This solution defines a clear strategy and goal-oriented actions, foster developing effective system of research and development, evaluation and quality standards, continuous professional development of employees focusing also on proper organizational culture.

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