

## ***A PLATFORM FOR QUALITY MANAGEMENT IN RESEARCH INSTITUTES (PART II)***



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## A PLATFORM FOR QUALITY MANAGEMENT IN RESEARCH INSTITUTES (PART II)

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### Summary

Recent years have particularly strong influence on changing outdated structures and management models in research institutes. Modern research institutes are scientific — research institutions with a market profile — nearly 80% of the funding comes from cooperation with enterprises and research contract activities and services. Research institutes are basic science sector oriented towards cooperation with the economy, applied and innovation research. In order to maintain the existing and establish the new cooperation a high level of quality of operations should be particularly maintain, improve and exhibit. Facing the implementation of more and more advanced research projects, operations requiring rapid response to change, risk analysis, assessed annually by the Ministry of Science and Higher Education — it seems to be appropriate to use the instruments supporting quality assessment. In the proposed triaspects terms, the following scope of activity are emphasized: implemented quality management systems, the area of scientific information and the sphere of cooperation with the customer.

The article is a continuation of topics of the first part — the development of issues related to the responsibilities of each Section of proposed Quality Management Platform in research institutes.

**Keywords:** Research institute, quality management, R&D activities, quality management system, scientific information, marketing in science



## The scope of responsibility of the Section "Quality Management Systems"

The Section "Quality Management Systems" can function most efficiently in research institutes which have implemented a standardized quality management system. The fact that the implementation of such a system is voluntary means that not all units decide to implement them. Broad scope of operation of Quality Management System leads to a situation in which also in research institutes without a system functioning according to norms creating this section is both justified and purposeful (e.g. informative mission for employees in the scope of spreading the awareness of the term of quality of research institutes' activity, defining a good quality product and the way it is created).

Investigation of the status of all 116 research institutes in terms of whether they have an implemented quality management system, or not [Brzeziński P., Stypułkowski L., Borych A. 2014], revealed that:

- research institutes have 591 laboratories with competences confirmed by authorized organizations — this constitutes 70% of the laboratories of all scientific units in Poland;
- research institutes have 315 implemented quality systems — this constitutes 63% of all scientific units in Poland;

One of the most significant incentives for the client is the aspect of professionalism, diligence and credibility. Undoubtedly, what confirms and guarantees an adequate level of quality of services offered by a research institute is a properly functioning quality management system. Quality can and should be used in the process of competing. It determines the potential of competitiveness and competences of an institute. The efficiency of such solutions depends to a large extent on convincing the participants of the purposefulness of their implementation — this is where the idea for a cyclical external evaluation of the functioning of the system comes from. Among the tasks of the employees of Quality Management System Section would be preparing, conducting and analysing surveys among employees and management of an institute. The results of these surveys would provide information about the attitude of the personnel to the maintenance of the system. Evaluations from the surveys should be compared with objective data — the results of audits, feedback from external clients, a balance of

costs and revenues of the activity subject to the scope of the system, analysis of the environment concerning potential chances and threats arising from changes in administrative-legal order in Poland and the European Union. Comparisons of this kind and later comparisons with the preceding periods would provide the management with a full image of the functioning of the system of quality management. This would constitute an instrument for the analysis of the justification for the maintenance of changes e.g. in the scope of the system (limiting/expanding the procedures), taking measures aimed at changing the employees' attitude to following requirements. The result of the analysis can be presented e.g. in form of a SWOT analysis.

Below exemplary results of simulation for research institutes in which a quality management system functions (e.g. according to PN-EN 17025, or PN-EN ISO 9001) are presented:

### Survey

In the survey the method of diagnostic poll was used. The research tool was a questionnaire including 12 questions (elements). It was possible to answer each question with a grade of 1 (weakest grade) to 5 (strongest grade). The results were determined as average values of the elements. The research sample was formed by 30 people divided into two groups:

- research team — 22 people,
- management — 8 people.

The dependent variables are elements — measurable variable described by the scale of 1 to 5 points, the independent variable are two groups of surveyed people: research team and management.

The participants of the survey assigned appropriate value to the following elements:

- 1 — level of involvement of the top management in the general issues of the system;
- 2 — level of employees' awareness of the validity of the functioning of the system;
- 3 — level of top management's involvement in the issues of trainings concerning the system;

- 4 — level of employees' awareness and motivation with regard to trainings concerning the system;
- 5 — level of facilitation of procedures;
- 6 — substantial level of handling the system documentation;
- 7 — level of employees' preparation for playing roles in the system;
- 8 — level of coordination of activities in particular elements of the system;
- 9 — level of identification of the client's needs;
- 10 — level of the capacity to satisfy the client's expectations;
- 11 — level of client's satisfaction;
- 12 — level of resources allocated to the functioning of the system.

Measurable variables are defined by means of arithmetic average and standard deviation.

Table 1. Averages together with standard deviations for elements 1–12 in groups:  
research team and management

Element	Research team=22		Management=8	
	Average	Standard deviation	Average	Standard deviation
1	3.95	0.58	4.63	0.52
2	4.23	0.53	4.63	0.52
3	4.09	0.75	4.50	0.53
4	4.18	0.59	4.25	0.46
5	4.09	0.43	4.50	0.53
6	4.14	0.94	4.38	0.52
7	3.82	0.85	4.25	0.46
8	4.23	0.61	4.38	0.52
9	3.91	0.87	4.38	0.52
10	3.82	0.66	4.13	0.35
11	3.82	0.39	4.38	0.52
12	3.73	0.63	4.50	0.53

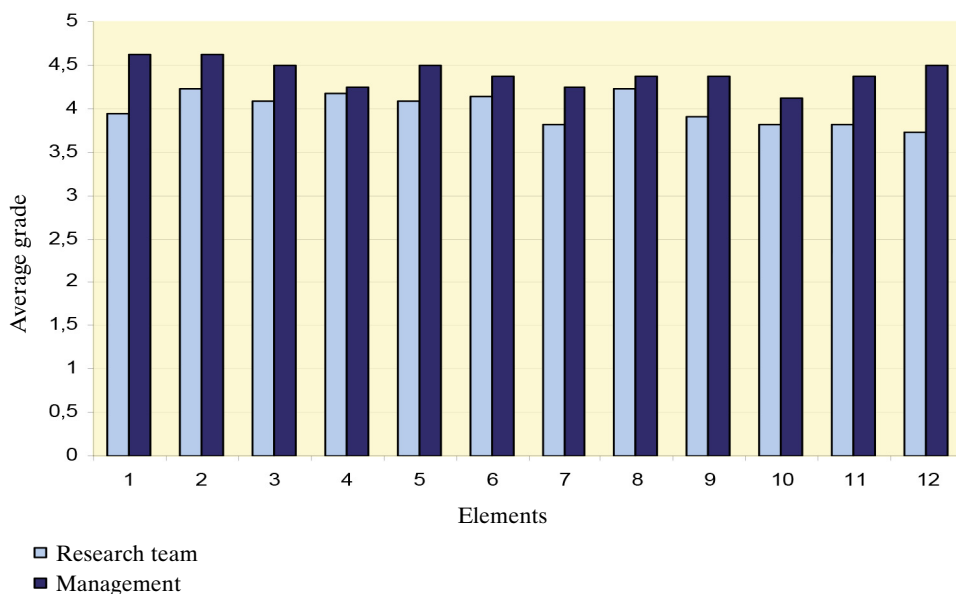
Source: Own materials.

In the group titled "research team" the highest grades were given to element 2 (average  $4.23 \pm 0.53$ ) and element 8 (average  $4.23 \pm 0.61$ ), and the lowest grades were given to element 12 (average  $3.73 \pm 0.63$ ). In the group titled "management" the highest grades were given to element 1 (average

$4.63 \pm 0.52$ ) and element 2 (average  $4.63 \pm 0.52$ ), and the lowest grades were given to element 10 (average  $4.13 \pm 0.35$ ).

Average grades for each element were higher among the people from the "management" group than from the "research team" group. A comparison of the average grades can be shown on a chart.

Chart 1. Average values for elements 1-12 in two groups: research teams and management



Source: Own materials.

### Remaining information about the management system

In order to carry out a full and credible analysis of the functioning of a quality management system in a research institute it is necessary to compare the results of the conducted survey with audit reports and feedback from the clients.

Raporty z auditów:

Table 2. Example of a set of data about audit results

Date of audit	Kind of audit	Number of inconsistencies	Kind of inconsistency	Follow-up actions
01.10.2012	accreditation (PCA)	10	<ul style="list-style-type: none"> <li>• incomplete records in the book of value,</li> <li>• overdue calibration of a measuring device,</li> <li>• lack of regulations for handling complaints,</li> <li>• lack of signature of the director of a laboratory on an official schedule of internal audits and trainings,</li> <li>• incomplete description of research procedures number 01/2012, 02/2012,03/2012,04/2012,</li> <li>• lack of designation of the version of issue on XYZ form.</li> </ul>	Started and completed on schedule
01.04.2013	internal	7	<ul style="list-style-type: none"> <li>• overdue calibration of a measuring device,</li> <li>• lack of documentation of order 55/2013,</li> <li>• lack of access to the training schedule for 2014,</li> <li>• lack of updates in the description of research procedures number 08/2013, 09/2013, 10/2013,</li> <li>• lack of designation of the version of issue on the ZMS form.</li> </ul>	Started and completed on schedule
01.10.2013	internal	6	<ul style="list-style-type: none"> <li>• lack of annotation about the scope of duties for a new position in the laboratory,</li> <li>• lack of notice on the provision of feedback questionnaire to the client in documentation of orders 64/2013, 65/2013, 66/2015</li> <li>• incomplete entry in the register of complaints concerning the case number 25/2013,</li> <li>• incomplete entry in the register of offers, concerning case number 35/2013.</li> </ul>	Started and completed on schedule
01.04.2014	internal	6	<ul style="list-style-type: none"> <li>• overdue calibration of a measuring device,</li> <li>• lack of documentation of order 12/2014,</li> <li>• incomplete entry in the registry of tender procedures concerning cases number 26/2014, 27/2014,</li> <li>• incomplete entry in the registry of offers concerning cases number 36/2014, 37/2014.</li> </ul>	Started and completed on schedule
01.10.2014	internal	5	<ul style="list-style-type: none"> <li>• not removing from the registry of equipment a scrapped measuring device</li> </ul>	Started and completed on schedule



Cont. table 2

Date of audit	Kind of audit	Number of inconsistencies	Kind of inconsistency	Follow-up actions
01.04.2015	internal	4	<ul style="list-style-type: none"> <li>• incomplete documentation from the ABC training held on June 1, 2014 — lack of training programme,</li> <li>• lack of protocol of delivery and acceptance concerning order number 39/2014,</li> <li>• incomplete entry in the registry of offers concerning cases number 40/2014, 41/2014.</li> </ul>	Started and completed on schedule
01.09.2015			<ul style="list-style-type: none"> <li>• lack of update of research procedure number 16/2012 in association with a change of norms,</li> <li>• incomplete entry in the registry of complaints concerning case number 14/2015,</li> <li>• lack of signature of the system plenipotentiary on forms number M/2015 and R/2015.</li> </ul>	
30.09.2015	internal	4	<ul style="list-style-type: none"> <li>• lack of offer number 41/2015 in the registry of offers,</li> <li>• lack of designation of the version of issue on the MSC form,</li> <li>• lack of AB employee hire form,</li> <li>• lack of access to the schedule of audits for 2015.</li> </ul>	Started and completed on schedule
	external (PCA)	3	<ul style="list-style-type: none"> <li>• overdue calibration of a measuring device,</li> <li>• lack of entry on the scope of duties for a new position in the laboratory,</li> <li>• lack of delivery and acceptance protocol for order number 36/2015.</li> </ul>	started — expected completion on schedule

Source: Own materials.

Feedback from clients:

Table 3. An example of a set of data on feedback from the clients

Kind of data	Year			
	2012	2013	2014	2015
Inquiry about the offer (laboratory research)	87	120	62	54
Inquiry about the offer (R&D works)	99	85	84	90
Inquiry about the offer (other activities of the institute)	53	45	48	42
Ordered works (laboratory research)	77	104	58	42
Ordered works (R&D works)	61	59	58	55
Ordered works (other activities of the institute)	42	39	38	30
Complaints about the results of research conducted in a laboratory	3	3	2	2
Complaints about the results of R&D works	2	2	1	1
Complaints about other activities of the institute	1	1	0	1
Complaints about service (professionalism, attitude)	2	1	1	1

Source: Own materials.

Analysis and assessment of information concerning quality management system

The set of data acquired in points 1 and 2 leads to the following conclusions:

- both the surveyed research team and the management give high grades to the level of functioning of the implemented quality management system. Employees appreciate give highest grades to their competences and at the same time give low grades to the level of resources allocated to the functioning of the system. Apart from appreciating the awareness of employees, the management has appreciated its own involvement in issues of the system. At the same time the management assigned the lowest grade to the issue of the capacity to satisfy the client's expectations;
- the results of audits (both external and internal) conducted from the start of the functioning of a quality management system in a unit show that the number of detected inconsistencies has been decreasing gradually. Inconsistencies usually concern negligence in the area of keeping records, or monitoring deadlines;

- over 4 years (in the period of functioning of the quality management system) the number of offer inquiries and thus also orders has been decreasing gradually (apart from the year 2013 — this was the last year of handling targeted projects beneficial for entrepreneurs in terms of financing, comparably easy in accounting — it was then that record-breaking number of targeted projects was registered — the SME sector eagerly applied for projects carried out together with research institutes — this led to orders for preparation of machines/technologies and carrying out appropriate tests and research allowing the introduction of a new product to the market). Complaints are rare.

The above data lead to the following conclusions, which can be expressed in form of a SWOT analysis:

- strong points: good assessment of the quality management system inside the institute — in particular, positive reception among the representatives of the management, comparably good assessment of the system by audits, dropping number of inconsistencies revealed during audits, small number of complaints;
- weak points: dropping number of orders, high level of resignation from cooperation (the ratio of inquiries about the offer to orders), employees' negative assessment of the level of resources assigned to the functioning of the system;
- possibilities: advertising of activity based on clients' positive assessment, expanding the scope of accreditation in association with the positive audit assessment of the current scope, employee trainings (on the basis of an internal opinion on the justification for continuous improvement);
- threats: further decrease of the number of inquiries about the offer and orders, lack of funds for the maintenance of the system.

On the basis of the above set of data the management can decide to take appropriate actions in order to avert threats and take advantage of the opportunities. In order to get a full image of the situation of the institute it is necessary to use the analyses conducted by the two remaining teams of the platform.

## Scope of duties of the Section "Scientific Information"

Along with research-development work which is a basic activity for research institutes, activity in the area of so-called scientific information plays a very significant role. Especially now, growing expectations of public administration bodies in the area of reporting (e.g. the POL-on system) impose more and more duties on teams dealing with scientific information. On the basis of the provisions of the act on research institutes<sup>1</sup> from April 10, 2010, in research institutes teams responsible for scientific information (branch centres of scientific information) can function — this belongs to basic activities of research institutes. The basic duty of this team is collecting, processing and providing access to scientific information (as well as to scientific-technical, economic information and information related to standardization), paying special attention to:

- publishing activity,
- branch activity of the scientific library,
- subscription for scientific magazines,
- collecting and providing access to patent information,
- creating and maintaining databases of knowledge and data banks,
- expert reports, opinions and scientific evaluations,
- promotion, dissemination and popularization of scientific achievements,
- trainings in the area of literature support for R&D works,
- protection of intellectual and industrial property,
- providing information and consulting with regard to standardization.

The experiences of the recent years show that transformation and weakening financial condition of research-development units often led to the reduction, or even liquidation of scientific information centres. The form of activity and the offer of the functioning scientific information centres have certainly become outdated. In comparison with the growing needs for informing and reporting, as well as the emergence of a new research area, that is, "information management" in the reality of an "information-based society", adapting the organization to the new requirements seems to be necessary. The multitude of national and international online databases (e.g. AGRO, BazEkon, BazHum, BazTech, CEJSH, DML-PL, Biblioteka

Wirtualna Nauk Przyrodniczych, PSJC, Owarta nauka, EMIS RCSB, interEDEN, NUKAT, ResearchGate), in which you should (out of duty, or voluntarily — for advertising purposes, or for the purpose of establishing cooperation) post information about the activity of your institute, justifies creating a young team acquainted with both the issues of contemporary information management and IT technologies. What confirms the significance of the work of the scientific information team is the fact that reporting duty was introduced under the POL-on system, (Act on rules for financing science<sup>2</sup> from April 30, 2010). The duty of managing and regularly providing complex information about the institute under such an advanced IT platform requires professional approach.

In November 2015 a survey of all 116 research institutes was conducted. The focus was on the situation of scientific information centres. On the basis of the analysis of organizational models an estimate of the number of organizational units (most often called "Scientific Information" and "Section of Publications and Data Processing", "Department of Knowledge Transfer and Innovation", "Centre of Information and Promotion", "Section of Dissemination and Transfer of Knowledge", "Information Processing Section", "Section of Scientific Information and Documentation with Library", "Scientific and Publishing Documentation Workshop") handling the discussed activities. The survey revealed that two thirds of research institutes maintain a separate organizational unit dealing with scientific information. 31% of them limit their activity to operating a library and a publishing house. In fact, only 52 research institutes (44%) boast a section of scientific information dealing with the issue in a complex manner. Despite this, on their websites up to 83% of institutes post information about the publications of their employees, or publishing activities. The formula of open access to publications is applied in case of 63% of the surveyed institutes. A similar percentage of research institutes present on their Internet websites information about handled projects, implementations, as well as organized conferences, trainings, fairs. A small minority (less than 20%) provides on the Internet tools of access to detailed data concerning the registered patents and utility designs and make it possible for users to take advantage of the specialist databases they operate. The general assessment of the conducted research shows that research institutes don't fully use the potential of the Internet for the purpose of presenting own scientific achievements.

Table 4. Scientific information in research institutes

Data concerning scientific information in research institutes presented on Internet website	Number of research institutes which have a particular element	Percentage of research institutes which have a particular element(100%=116)
Organizational unit for scientific information	76	66
Information about publications, publishing activity	96	83
Database of projects, implementations	75	65
Publications — open access	73	63
Information about conferences, trainings, fairs	72	62
Patent database	21	18
Specialist databases	20	17

Source: Own materials.

Within the quality management platform in a research institute it is necessary to restore the organizational unit of scientific information, or to verify in detail the scope of a team's work and adapt work organization to new conditions. A contemporary scientific information team should use available IT technologies to carry out its tasks. One of the most common technical problems associated with collecting, processing and providing scientific information are outdated technical facilities. Unfortunately, also the personnel's lack of awareness of modern tools, as well as unwillingness and fear of learning about them effectively block the development of scientific information in research institutes. It is hard to change the employee's way of thinking who for decades have regarded data collection as a senseless and arduous duty of entering data (often by hand) into registries. Effective utilization of scientific information requires treating modern IT tools (eg. ERP systems) and online databases as an opportunity to present the achievements of a research institute. The change of the format of data recording from paper to electronic — virtualization and visualization — always creates an added value:

- facility of publishing, distributing and processing information (mobility of knowledge) — boosting its usefulness,
- access to a global database of information,
- taking into consideration the specialist scope of activity of particular research institutes, it serves the purpose of integration and granting access to information for a given branch,

- guarantees the security of stored resources,
- support for the competitive position of Polish science,
- satisfying the growing demand of the sector of companies, public institutions and scientists for information,
- making it easier to guarantee the quality of information and communication processes (topicality, accuracy, comprehensiveness, credibility).
- saving time,
- saving financial assets.

In the era of internationalization of science an extremely significant quality aspect of activity is the issue of availability of information in English. More and more documents require translation — publications, applications for projects, project reporting, European patents, lectures and conference presentations, promotional materials, Internet website. The presence of a competent translator specialized in particular in the subject of a research institute's activity in the team (a perfect situation is training an employee of a research institute knowing the character of the institute's activity in translation) may guarantee availability, punctuality, professionalism, the possibility of managing its work.

The influence of new technologies on the quality of scientific information more and more often attracts the interest of specialists. New roles of the employees of Scientific Information (Głowacka E. 2004) are emphasized, as they are supposed to form a kind of bridge between the user of information and the researcher. Universities are setting up specialist areas of study. In literature and practice such new terms as: information manager, information architect (Skórka S. 2011), or information broker (Kowalska M. 2014) have appeared. This illustrated the broad scope of subjects that a person specialized in Scientific Information is supposed to deal with. An employee responsible for the analyses of scientific achievements, important in the process of assessment of a research institute, is called a plenipotentiary for science measurement analyses (Głowacka E. 2004). Quality management and assessment in a scientific information system involves the absorption of TQM approach and applying specialist methods and indicators for the assessment of efficiency (Derfert-Wolf L., accessed in 2015, Derfert-Wolf L., accessed in 2016, Głowacka E.,

accessed in 02.2016, Materska K., 2007, Pindlowa W., accessed in 2016).

It is necessary for a research institute to raise the awareness of Scientific Information within the organization, as all its employees should know their information resources in detail and be aware of their value. Proper organization of scientific achievements and availability of the results of activity (publications, information about publications, conferences, projects, implementations, patents, statutory works, standardization works, rewards) has a beneficial impact on not just the image of a research institute. For scientists it is a place where they can publish their research results, it enables access to information, affects the number of citations. It makes it easier for research institutes to manage and evaluate knowledge, allows to promote employees' scientific achievements. Financing institutions achieve higher return on investments in scientific research and a possibility of promotion.

### **Scope of duties of the section "Cooperation with the client"**

The role of the section of cooperation with the client (CC) boils down to the processes of identification the clients' needs (market analysis), creating an offer satisfying the current needs, communicating about the offer, delivering value and after-sale service. The remarks of clients registered in the last phase result in adaptation of the offer to expectations, turning the process into a loop cycle. However, this classic model has to be transposed to the characteristic portfolio of products offered by research institutes. The most important "product" of the activity of research institutes are the results of R&D works. CC section is supposed to give an attractive form to the products and boost the recognisability of research institutes.

In course of the survey of all 116 research institutes conducted in November 2015, apart from the analysis of the area of Scientific Information, Internet websites were verified in terms of information and tools serving cooperation. On the basis of the analysis of organizational models an estimate of the number of organizational units (called most often "Marketing", as well as: "Department of Projects and Marketing", "Department of Management, Marketing and Human Resources", "Centre of Information and Promotion", "Section of External Contacts",



"Department of Research Commercialization and Cooperation with Practitioners", "Department of Market Service", "Centre of Project Coordination and International Cooperation", "Section of Promotion, Section of Cooperation with Producers", "Department of Marketing, International Cooperation and Standardization") handling the discussed activity. The analysis shows that merely 35% of research institutes maintain a separate organizational unit dealing with forms of cooperation with clients. Almost all research institutes publish on their websites contact data and a general description of activity. 85% of the surveyed units have an English version of their website. Most (62%) present specialist offer for potential partners and only 27% offer cooperation with foreign entities. Less than 1/3 of research institutes take advantage of modern IT technologies (e.g. social media) in order to advertise themselves, or establish cooperation. 11 units dealing with contacts with the media and interested parties had a position of a press spokesman. Again, it is possible to make a conclusion that research institutes haven't adapted the form of presentation of their offer and achievements to contemporary technological opportunities and trends in communications.

Table 5. Section of cooperation with clients in research institutes

Data concerning cooperation with the client in research institutes contained on Internet websites	Number of research institutes which have a particular element	Percentage of research institutes which have a particular element
Department of cooperation, marketing	41	35
"Traditional" tools for dialogue (e-mail, phone, address)	115	99
Description of activity	107	92
English version	99	85
Offer for the economy	72	62
"Modern" tools of dialogue (FB, You Tube, newsletter)	34	29
Cooperation with abroad	31	27
Press spokesman	11	9

Source: Own materials.

R&D works are a product subject to the rules of marketing. The key issue influencing the attractiveness of the offer of research institutes is the

implementation of modern marketing instruments and the construction of a business model adapted to the needs of the contemporary market. Along with the change of economic conditions, the situation of research institutes has changed. The flow of orders from the industry is not guaranteed any more — now it is necessary to focus on the client and compete for him on the open market (even the international market). Contemporary recipient of R&D works is demanding and the willingness to cooperate usually comes from the research institute — for this reason it is particularly important to present the offer in an appropriate form evoking the trust of the client and willingness to build business relations.

The operation of the CC section can be supported through the implementation of a customer relationship management system (CRM), which enables transparent collection of information about clients, handled subjects, products, sales, an analysis of the clients' needs, client satisfaction, segmentation of clients (enabling the individualization of the offer).

A "classic" kind of marketing activity aimed at acquiring and keeping a client usually practiced in research institutes is:

- preparing informative materials on paper,
- organization of conferences, trainings, lectures, symposia, workshops,
- preparing presentations and exhibits for fairs, shows, branch meetings,
- participation in competitions, invention fairs,
- care about the visual informative elements within a research institute (logo, flag, information boards, sign posts).

In order to reach a broader circle of potential recipients of the works of research institutes it is definitely necessary to promote activity and achievements also by means of Internet channels — appropriately designed, visually attractive, multi-functional Internet website (information about the research institute, open access to specialist databases, publications, handled subjects, various forms of contact with specialists), so-called social media, videos, publications on specialist portals.

It is also impossible to overestimate the participation of research institutions in cooperation platforms, branch clusters, local communities — CC section should be responsible for the identification of such gatherings

and coordination of the participation of a research institute's representatives in such organizations.

In times of globalization of science, international cooperation is becoming an inseparable element of activity of research institutes — help (organizational, linguistic) in the area of attracting partners for joint research projects, establishing cooperation in the area of publishing, conferences, working out innovative solutions (patents, licenses) should be the subject of activity of a CC Section.

An important aspect in the creation of the image and boosting the recognisability of a research institute is carrying out tasks in the area of public relations — preparing information for the press, presentations, shows, lectures, thematic meetings (informative, charitable, sponsoring) can belong to the tasks handled by CC Section.

In order to guarantee quality in the presentation of its offer, CC Section has to closely cooperate with the Scientific Information Section (SI) — the "provider" of the material that is supposed to be promoted. What influences the assessment of the quality of scientific information is the way it is presented — in a diligent, full, credible form, supported by examples of application, highlighting the usefulness of a solution, visually attractive, linking authors with a research institute.

CC section plays a major role in the process of organizing contacts with clients and promoting the brand of a research institute. This activity directly influences the perception and assessment of an institution by the potential and current partners and this directly impacts the willingness to establish cooperation.

## **Conclusions — Justification for the integration of the Section as a part of the Quality Management Platform**

The establishment of a Quality Management Platform is an innovative solution in the area of techniques of research institute management. Reorganization and integration of the Section of Management Systems, Scientific Information and Client Cooperation into one unit can guarantee a complex analysis of issues associated with quality management in research institutes and thus the justification for integration of sections is confirmed by the following aspects:

- taking advantage of experiences and applied good practices in quality management;
- focusing on the common target — multi-aspect quality management — this favours the creation of pro-quality initiatives;
- reevaluating targets — adapting the strategy of activity to the requirements of the market;
- raising the awareness of the rules of quality management within the organization, taking up new initiatives in this respect;
- facilitating access to information — for management about the situation and internal opinion about the Quality Management System and grounds for taking necessary actions; for employees about the ways of publishing information about achievements; for external clients — about the offer of cooperation;
- possibility of simplifying documentation as a result of combining and unification of analogous pro-quality procedures;
- elimination of repetitions both in the areas of documentation and the scope of works up till now handled often by a few organizational units;
- the possibility of instilling a philosophy of work aiming at ordering scientific achievements and consequently to an efficient creative work of scientists;
- reduction of administrative costs resulting from the improvement of internal coordination of activities, speeding up the flow of information, cutting the time needed for making decisions, improving the efficiency of management;
- development of the organization towards integrated responsibility — better defined responsibility;
- applying the cycle of continuous improvement, which leads to a situation in which the improvement of quality causes the improvement of other systems based on the effect of synergy;
- improvement of competitiveness.

## Conclusions

The domestic market is facing a series of challenges, including:

- advancing process of globalization and lack of barriers in the access of non-European rivals to the internal market of the European Union,
- insufficient utilization of the potential of knowledge for the introduction of significant technological and organizational changes in companies,
- slow growth of innovative products in companies' offer,
- raising efficiency is too slow,
- finding it hard to conquer new markets for own products,
- limited capacity of fast and flexible reaction to changes taking place on the global market (change management),
- adapting technology and products to growing legal requirements.

Research institutes should support the economy in, among others, the scope of the above goals. In order to make a research unit a competitive entity worth of cooperation, an entity with which entrepreneurs would like to cooperate and in order to grant easy access to reliable information (both about the unit and to knowledge from the area covering the scope of activity of a research institute) to public institutions and other stakeholders (including internal stakeholders — management and research institute employees) it is necessary to enrich and create new forms of quality management instruments.

Consolidation and modernization of auxiliary departments (such as: Quality Management Section, Scientific Information Section and Section of Cooperation with the Client) in the proposed form of Quality Management Platform:

- improves the utilization of the existing infrastructure and thus reduces intermediate costs,
- supports the development of a new approach to supporting research-scientific team in the area of promoting their achievements,
- implies the implementation of modern, computer-based management systems integrating the areas of choice and coordination of research works, personnel issues and accounting, which brings order to the

functioning of this sphere and at the same time facilitates activities from the scope of work service and cooperation with units supervising and controlling the research institute;

- stimulates the intensification and facilitation of scientific communication through the necessity to obtain complex information from research teams,
- enables formulating strategic plans aimed at quality and a continuous process of improving quality, prepared on the basis of very detailed analyses of functioning,
- enables working out indicators of efficiency and measuring efficiency,
- integrates and raises the engagement of employee teams from various sections,
- leads to the enrichment of knowledge about the needs of employees,
- facilitates more efficient management of financial assets.

## References

<sup>1</sup> Art. 2 ust. 1 pkt. 6.

<sup>2</sup> Art. 4c.

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