

Ewa Kochańska

Research and Innovation Center Pro-Akademia

9/11 Innowacyjna St., 95-050 Konstancin Łódzki, ewa.kochanska@proakademia.eu

LANGUAGE OF BENEFITS FOR DIGITAL SHARING OF KNOWLEDGE ON THE OPEN ACCESS INTERACTIVE PLATFORM

Abstract

The main objective of creating the open access to databases is to develop of innovation and efficiency in all aspects of socio-economic development. The article discusses the issue of open access to public data and focuses attention on the information of the results of research, useful to entrepreneurs. Open access to the data of the R&D institutions can be practically achieved thanks to implementation of an interactive platform. The proposed platform should uses the procedure for:

- collecting data from individual R&D institutions websites,
- translating them into language of benefits, comprehensible to entrepreneurs,
- distributing the transformed information to the proper entrepreneurs, selected by the code of NACE.

The Author tackles the topic of digital knowledge-sharing in the context of the acceleration of socio-economic development in Europe. She discusses her own proprietary software tool - an interactive platform that uses so called "the language of benefits" for transferring the scientific research results to business practice.

Key words

Open access, open innovation, bigdata management, interactive platform

Tools and procedures of digital sharing of the European science resources – state of the art.

New technologies, the key to building a competitive economy at national and regional level are arising more frequently thanks to the intimate association of enterprises with science and its latest developments. The fastest growing innovative economies nowadays base not on natural resources or other material factors as it was in the nineteenth or twentieth century, but on high-quality social capital, information and communication technologies, international cooperation on global and local scales. The crucial for the social-economic development is implementation into economic practice the innovative products and services, resulting from the common work of scientific research institutes, universities, development centers and business. The key factor determining the exchange of information between the business sector and academia is open access to data, in accordance with the paradigm of Open Data and Open Innovation Ideas.

The practice of open access to data is at a very preliminary stage of development. However, the issue of open access to information in general is analyzed by a few researchers from as countries as India [1], US, [2] and Australia [3].

An interesting presentation regarding the open access to knowledge and information, titled "Scholarly Literature and Digital Library Initiatives. The South Asian Scenario" was published by UNESCO [4]. In Europe, The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities is one of the milestones of the European Open Access movement [5]. The Berlin Declaration is in accordance with the spirit of the Declaration of the Budapest Open Access Initiative [6]. Together, Budapest and Berlin Open Access Initiatives stress that every institution of higher education and scientific institutions should have an active policy assuring that future theses, dissertations or results of the research and development are deposited upon acceptance in the institution's Open Access repository. At the request of researchers or students who seek a patent on a patentable discovery, policies should grant reasonable delays of Open Access rather than permanent exemptions. Additionally, every research funding agency, public or private, should have a policy assuring that peer-reviewed versions of all future scholarly articles reporting funded research are deposited in a suitable repository and made Open Access as soon as practicable. The important problem of management of bigdata and open access to information is analyzed by Ireland authors. They state that we have worldwide a growing number of large collections of digital sources, but we – researchers and end users - are working with them in a manner known from the analogue world. There is a need to work together - scientists and developers to

develop useful, proper digital tools in the actual research work, which can fit the open access to knowledge paradigm [7].

In Poland the Open Access issues are the subject of research studies The Centre for Open Science (CEON) dealing within the framework of the Interdisciplinary Centre for Mathematical and Computational Modelling, University of Warsaw. Polish scientist dealing with the open access to information in scope of legislation dimension is Siewicz [8].

According to the Open Data Barometer [9] the first major undertaking in terms of open access to public information (Open Government Data OGD) took place in 2008 and since then around the world arose hundreds of open data access platforms created by national and local governments, international institutions, non-governmental organizations and companies.

After all, now just only 7% of global databases is made available without restrictions, equipped by legible form and open licenses. Closed access to public data causes unnecessary inconvenience to users of the data, however the society is the natural owners of the data for example the public health service patients. The essential groups of users of public data are scientists and entrepreneurs, especially start-ups and innovators and innovativeness companies. That means the main objective of creating the open access to databases is to develop of innovation and efficiency in all aspects of socio-economic development. To achieve this, OGD should have a high level of broad political support, and their owners should invest in building collaboration of businesses and various groups of stakeholders focused on the open databases. The issue of highest importance is understanding that the OGD can be used for economic and social development.

The wish of co-founder and one of the pioneers of web technology, the British physicist and programmer Sir Timothy Berners-Lee, should be the open access to web services and to public data. Open access is one of the fundamental human rights. The right to get information and to be fully informed should be treated as the entitled public good. The fundamental conditions for the development of open access to information are:

- Firstly: acceptance for the assumption that open access to public information as a fundamental human right;
- Secondly: guarantee the security of data (date cybersecurity and Data Protection Law);
- Thirdly: developed data management systems and digitization of public information.

Experts expect that open access to data will have a positive impact the following aspects of social and economic life:

- The efficiency of the administration services, both: through more efficient internal management and providing public services of better quality and by creating opportunities for society by offering full range of data;
- Transparency and accountability of public authorities, health services, courts, etc.;
- Improving environmental conditions and improvement measures for environmental conservation;
- Activation and inclusion of marginalized groups;
- Stimulating innovation and economic growth, thanks to the possibility of wider open access to diverse information and remote contact with the administration;
- Development of world science.

The most advanced systems for open access to public information are installed now in such areas of data as statistical reports, censuses, court registers, data cadastral or vehicles registers. However, in most countries, the key data sets for business or science are not available in open access databases, and if even some of public data have been already available, but most of them is published in non-standardized formats. For example, databases of public transport, although they are based on standard, well documented data, only in 25% of countries included in the Report [9,p. 7] for the year 2013, are available in machine-readable format. Additionally, the data mapping is often not available in digital form or if it is available, then only for a fee. That means the use of public data remains a problem in many countries.

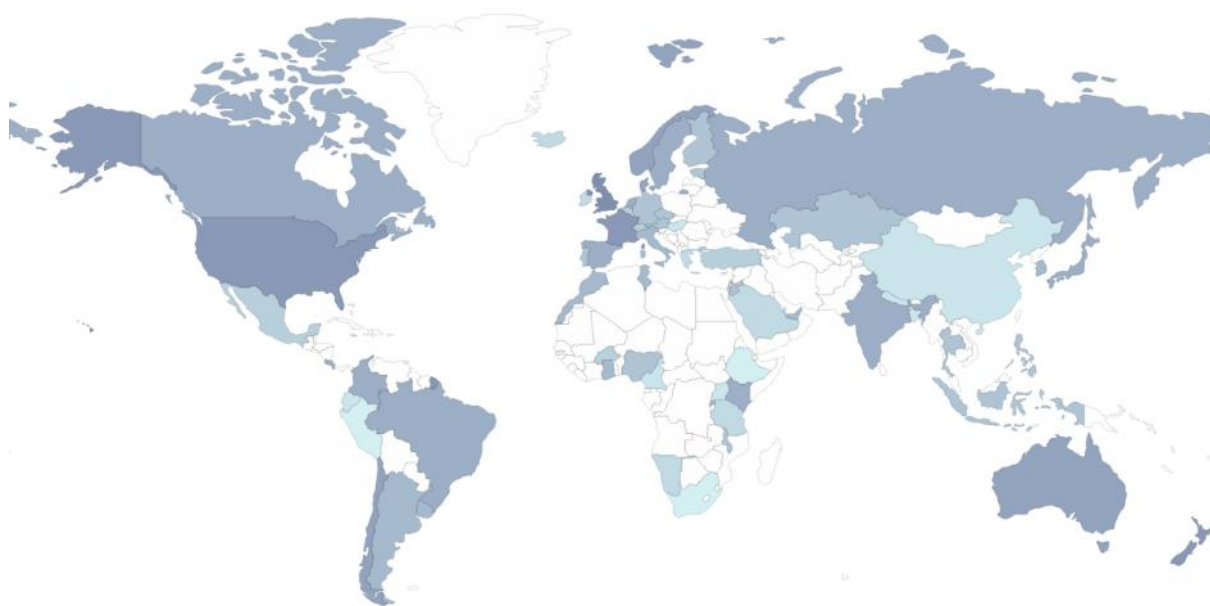


Fig. 1: Map of the level of development of OGD initiatives. Countries where OGD initiatives are the most advanced marked the darkest shade of blue, and white spots indicate a lack of data.

Source: Author's

The OGD report for 2013 year shows that areas with the highest number and the highest level of the development of open access to public data are the United States and Europe. United Kingdom is the leader among the European countries. The close relationship between the Human Development Index (HDI) and open access to public data is observed:

Table 1: The relationship between HDI and other parameters of socio-economic development (z-score)

Level of HDI	Rights to information	OGD initiative development	Civic society development	Government support to OGD	Development of OGD in the regions or cities
Very high	57,81	59,69	60,31	40,28	45,14
High	48,75	43,13	31,88	18,06	22,22
Medium	40,00	40,91	34,55	18,18	12,12
Low	41,11	21,67	25,00	11,73	2,47
Total	49,48	44,68	42,47	25,83	25,69

Source: [9]

Open data access to resources of Polish science.

In 2015, the Ministry of Science and Higher Education approved for implementation of the document titled *Trends in development of open access to scientific content in Poland, 2015* [10]. Open access to scientific information in Poland is a consequence of the adopted general principles applicable in Horizon 2020, which means a mandatory open access to scientific publications that would be created during the implementation of projects, financed under H2020.

The Polish Ministry states that the purpose of dissemination of the paradigm of open access to scientific information and data is to increase the scientific research availability for the different groups of stakeholders and foreign partners as well.

The comprehensive use of scientific research results, achieved by Polish scientific institutions, especially these which are financed from public funds, could lead not only to arising the potential of Polish science, but to support the achievements of social development economy of the country. It is recommended in the document the scientific institutions and universities to prepare and implement in practice the open access procedures

regarding publications and research data. In accordance to these above guidelines, Polish scientists, authors of scientific publications should publish their studies in a particular open repository the full content of their work, or links which take the readers to the full text. However, there is no precise information about what kind of the open repository is about - it could be presumed that the document refers to the repositories at the national level, in such a format that allows integration with the EU repositories and at the same time, the national repository should be joined with repositories of the Polish universities based i.e. on academic libraries. The Polish instrument forcing a changes towards the open access to scientific publications will be implemented now, modified system of financing magazine, published by Polish scientific institutions. The following criteria will be decided of the level of public funding for scientific journals:

- the share of foreign reviewers in the evaluation of articles;
- participation of foreign scientists in the scientific board of the journal;
- edition in English-language;
- the digitization of articles or scientific monographs and open access to them via the Internet.

The open access to scientific data may be performed in one of two forms: a gratis and a libre. "A gratis open access" means that data is available on the Internet without technical protection. The user can take it for free, but only in compliance with copyright: the user can quote with a reference, but he cannot distribute the original version or translation work. In the case of libre type access, the author of the article grants the reader a license to use his article in a very wide range. User rights model, in the libre access is comparable with the rights of an author. Detailed rules for publishing open access to information in the libre model were discussed in detail by Siewicz in the material titled Parallel publishing in open access [11]. Development of the Polish system of open access to scientific data will require in-depth analyzes in context of storage, processing, distribution and sharing of scientific information, taking into account differences between areas of knowledge, sciences and disciplines, as well as the development and implementation of the package of cybersecurity in relation to personal data. The problem of the highest importance is ensuring secrecy of data belonged to universities but to business as well, guaranteeing protection of trade secrets and intellectual property rights.

INFO-INNO-LODZ - Evaluation of opportunities to increase the effectiveness of methods of informing about the competence and resources of regional research institutes .

Open data access is a prerequisite for the development of open innovation paradigm [12]. Research and Innovation Centre Pro-Academia (RIC) a non-governmental, one of the most important stakeholder of regional innovation system in Lodz region and the scientific institution as well, has just conducted the research titled *INFO-INNO-LODZ - Evaluation of opportunities to increase the effectiveness of methods of informing about the competence and resources of regional research institutes*. The study, conducted in the period December 2014 - September 2015 consisted of the following four measures:

- A qualitative research based on a group of 56 research institutions located in Lodz region and subjected to parametric evaluation by the Ministry of Science and Higher Education in 2013, using "mystery client" methodology, modified to "mystery e-mail" research methodology.
- The study desk research with the analysis of the benchmarking of regional research institutions.
- Desk research of open access to information system about intellectual and material potential of universities, R&D institutions and scientific journals, published in Lodz region.
- The quantitative research and qualitative analysis carried out by a team of CBI Pro-Academy on a group of 1,000 respondents.

Within the research the following problems were analyzed:

- assessment of the websites of scientific research institutions as a basic tool for communication with the stakeholders, especially with entrepreneurs;
- assessment of the availability of scientific journals published in Lodz region by scientific institutions and universities for individual inventors or innovators especially entrepreneurs and start-up's;
- assessment of the Pol-one Database as the most complex information base on intellectual and material resources of universities and scientific institutions;
- evaluation of the currently existing digitized database of scientific institutions on the regional level in order to establish cooperation with enterprises;
- SWOT analysis of existing currently methods of information about innovation in the Lodz region;
- the public opinion poll about the effectiveness of open access to information about innovations in the region.

The conclusions of the research show the need for undertaking the intensive, comprehensive efforts to build an effective system of exchange of information on research and development regional resources. Survey respondents assessed the methods used until now to inform about the innovations in Lodz region as "requiring the development" (64% of respondents), 18% of respondents considered it suitable and sufficient. These opinions have been verified by set of deepening questions. Respondents questioned about their knowledge on regards the websites dedicated innovation issues, predominantly (71% of respondents) answered "No, I am not familiar with such websites", only 17% answered positively.

To the question: "How well are you oriented in respect of Lodz region potential of scientific research?" the majority of respondents replied that they are familiar with the intellectual resources the least, they know very little about the financial resources at the disposal of universities and scientific institutes and equally little respondents know about the organizational and technical resources, or laboratories equipment.

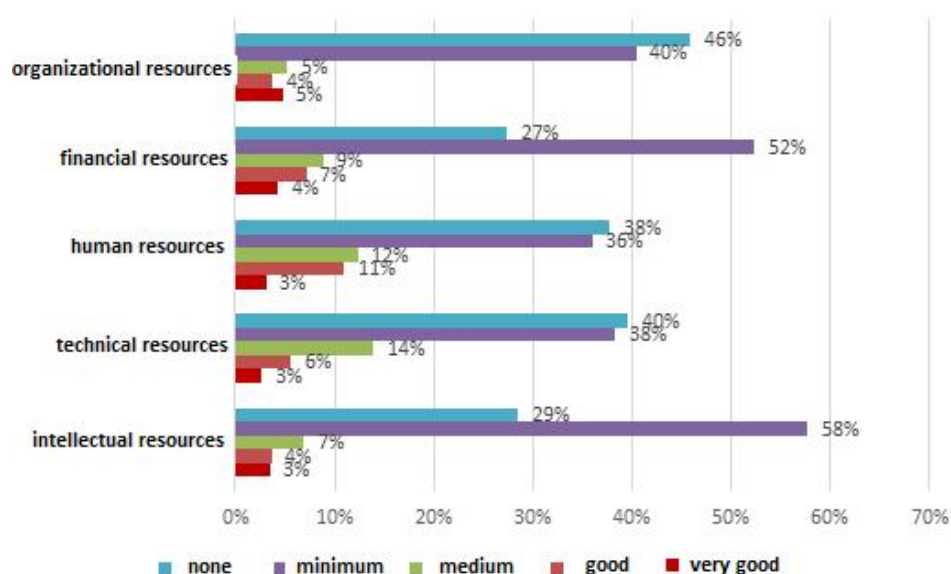


Fig. 2: The level of respondents' familiarity with the regional R&D resources (n=715%). Please note: respondents could make multiple choice, therefore the number of responses did not add up to 100%

Source: RIC Pro-Akademia, based on CAWI / CATI research.

During the second stage of the research the opinion of respondents about the methods and types of media were analyzed. The main aim of the research was to find the answer what form of information about innovation seemed to be the most effective as carriers of data.

The first question was: "How important for socio-economic regional development is open access to information on innovation?". 75% of respondents felt that it is very important (45%) and important (30%). 15% of respondents answered it is not important, and 14% of the group said it does not matter. All respondents participating in the IDI/TIDI research expressed the opinion that the currently applied methods of sharing information, access to data about the science and form of reports on innovation are insufficient. Representatives of science stressed the need to integrate the regional potential of R&D and implement an open access to their polarized, distributed database.

It is worth to discuss about establishing the single open access platform enabling to present an offer of scientific research and repositories of science. They expressed confidence that this task should be carried out at the level of regional or national policy. They indicated the importance of collaboration of schools on all levels – starting from secondary schools, through universities, technical universities, colleges and vocational schools finishing on professional trainings for employees and unemployed people. The open access will be the effective tool for the dissemination of knowledge in the field of innovation as well.

On the other hand, young scientists, taking part in the research, showed the problem of insufficient system of information exchange not only between science and business, but also between different departments of the

university. They pointed the urgent need to integrate information databases of all research departments on the regional level but using the EU standards. This weakness of data exchange system limits the potential of creation the interdisciplinary projects. Internet was recognized as the most effective medium for dissemination of information about the resources of science. The open access internet platforms were considered as the most proper and expected tools for all sorts of promoting innovation campaigns. Within the research the analysis of the informational value of scientific publications, published by the R&D institutions in Lodz region was performed and the review of regional journals available on their websites was realized.

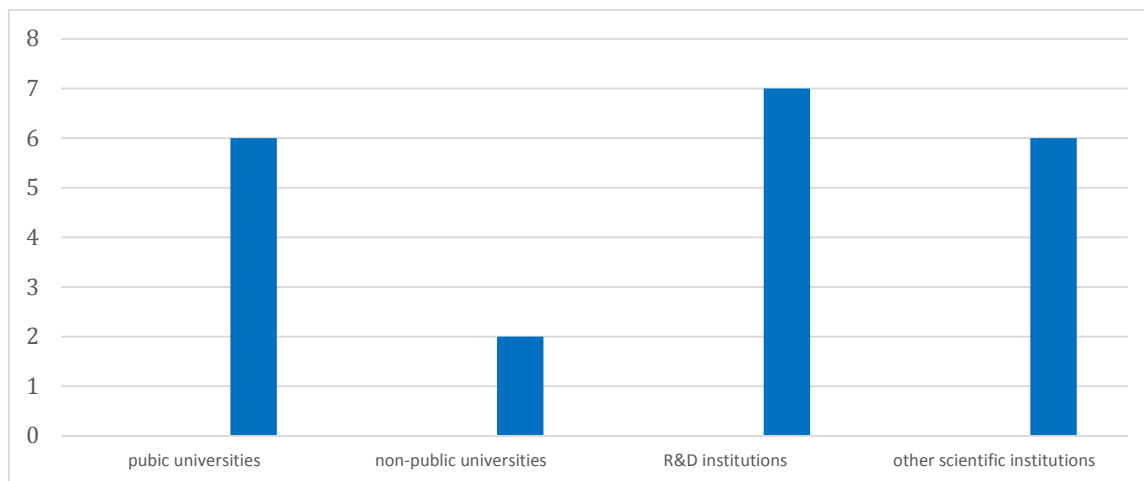


Fig. 3: Structure of scientific entities in Lodz region, 2015

Source: RIC Pro-Akademia, based on Pol-on database

Having a prestigious, high-scoring scientific journal strengthens the image of the R&D institution in the circle of scientific and proves the high quality of the ongoing research and studies and their importance for the development of science. In the current process of evaluation of scientific journals within the RIC Pro-Akademia research, the open access to journal was taken into account as the main criterion for the assessment. Contrary, for the Polish Ministry of Higher Education the most important measures for evaluation of scientific journals are: the list of reviewers, the process of review, electronic versions of articles /digitalization/. The Ministry does not assess the open access to different types of stakeholders. However now, in the *Strategy for the development of open access to scientific content in Poland* the journals are instructed to implement the obligation of digitization of all kind of publications - articles, monographs and MSc. or Ph.D. dissertations to ensure open access via the Internet to them.

How important for business is the open access to knowledge published within the scientific journals Table 2 shows:

Table 2: The evaluation criteria of open access to scientific publications from a business perspective

no.	Criterion I: Form
1	Availability of the journal website Is it easy to find a journal website? Is the website can be easily found through Google search? Has the journal an own active website?
2	Cleanness of the website Is the website coherent from the form and graphic presentation point of view? Is the website readable? Does the website possess the right address, referring to the content, intuitive, easy to remember?
3	The attractiveness of the website Is the layout is modern, color consistent? Does it contain multimedia elements attention-grabbing, non-dispersible, but affecting favorably the reception? Does it present the additional information, attracting attention of the recipient, eg. information about conferences, events, others surprising news, attractive for readers of the website?

	Criterion II: Content
4	Timeliness of information Is the information presented on the website current? Can one easily find the latest edition of the journal?
5	Completeness of information Does the website present closed, comprehensive description of the journal, after which the reader can easily answer the question, what is the subject of the journal, to whom it is addressed? Does the website instruct the readers how they can read the articles of the journal? Does the website inform about the character of the journal - is it an academic title, what is the level of IF of the journal?
6	Communicativeness of the website Is website written in clear, understandable, communicative, popular style, accessible to recipients who are not expert in the branch of science? Is it possible to view the full article?
7	Language versions Does the site have Polish and English versions as minimum?
8	Utility Is it easy to reach the full content of article, download it, save it, view it at any time? Has the website the open access to archival edition of the journal? Is it possible to download graphic elements, such as logos or cover?
9	Contact information Does the website is full of contact to the editor - postal address, e-mail, telephone number? Are there are any descriptions of members of the editorial board? Is it possible to identify and verify the competence of the people working in the editorial board of the journal?

Source: RIC Pro-Akademia, 2015

The results of the RIC Pro-Akademia analysis of websites of journals published by scientific institutions in Lodz region, leads to the following conclusions:

- journal published in Lodz region are not adequately presented in the Internet: nearly all the websites of scientific journals are hidden deep in general websites of university or R&D institution which publish them;
- there is not clear, direct relation of the website of journal to the main activity of its publisher (university or R&D institution);
- some journal websites are part of the university service;
- there are identified some journals which have their own websites, dedicated only to a journal, not split with the general image of their publishers (e.g. Universities). In such cases, the layouts of journal website, often due to a different system on which the website is built, for example - when a website is based on the Open Journal System, or when an administrator of the website works externally, the journal website is differ from the actual website of the University. These differences are often in favor of the magazine, however, it is raised an impression of separation journals board and scientific institution.
- in the case of several journal websites the lack of basic information - such as the thematic profile – was identified;
- a characteristic feature of the journal websites is an ambition to adapt the content of the journal to The Ministerial assessment and requirements. Publishers ensure that the journal websites contain information such as a list of reviewers, the evaluation procedures, editorial ethics and information about the original version of the article. It is of course correct, and because of the Ministerial assessment, which is the main, essential indeed subject to publishers, but from the point of view of stakeholders outside the science – the open access to journal is the criterion of the crucial character.

Good communication with the reader outside of the scientific community should be the ambition goal for publishers of the scientific journals. Finding the balance between high level of knowledge, which ensuring a high position of the journal in the Ministerial assessment and utility and accessibility to different groups of the innovation ecosystem stakeholders is the definite challenge nowadays.

Editorial board of the journals should be aware of the needs of different groups of stakeholders, to whom they address the intellectual message - whether they are ministerial decision-makers, academics, researchers, authors and readers of scientific texts, or entrepreneurs. The analysis and result of the research lead to the general, but not very optimistic conclusion that journals published by scientific institutions in Lodz region do not notice and appreciate entrepreneurs as their readers. To change this situation and to encourage entrepreneurs to be a readers of scientific journals via journal websites, the communication strategy of journals should be re-thinking, namely:

- Firstly - a journals should carry a clear, attractive form of presentation of scientific issues in the "language of benefits";
- Secondly – the special descriptions in popular style, addressed to entrepreneurs should be added;
- Thirdly – the supplement to website with information about conferences, events should be implemented. One of excellent way to build strong relationships with readers, including entrepreneurs, may be the newsletter informing e.g. about the content of new edition of the journal, promising articles, invitation to the contact with authors or publishers;
- Fourth - it is necessary to organize open access to information and full articles, and to summary of the major collections and databases;
- The fifth - in the modern scientific communication, journal websites cannot be just a "showcase", must offer the open access to articles, and to authors, reviewers. Thanks to open access database, the coordination, internal work of editorial board, publishing and sharing innovation ideas will be easier.

The European interactive platform – the open access to data and information of science.

Analysis of information system on research, conducted in scientific institutions in Lodz region, resulting from the above-presented RIC Pro-Akademia research leads to the conclusion, that the lack of interactive and automated tools for organizing cooperation between science and economy is noticed. The existing database of science are closed, static, distributed, written in language too specialized and hermetic, inaccessible to individual scientists, e.g. Ph.D. students and mostly – the websites have been not updated. The websites of research institutes don't clearly identify information files that would be addressed to entrepreneurs specifically. On the websites of the R&D institutions, there is no invitation for collaboration for Polish companies, nor for the foreign partners. Contrary, at the moment, companies do not have the appropriate tools on websites which could be used to affect the R&D institutions in Lodz region.

These problems and conclusions of the above presented research lead to the following observations:

- lack of an integrated, comprehensive and open database of science and research affects unfavorably for the key sectors of the regional economy;
- lack of tools like "research and technology watch" which would be programmed for permanent monitoring the websites of universities and research institutes, scientific journals, conference seminars, etc. in order to gather data, share knowledge and create innovations;
- considering the tremendous pace of changes in the strategic for the EU and Poland innovations, lack of open data base in research and development is one of the major reason of low level of innovativeness in Lodz region;
- ongoing monitoring of R&D in the world, in the European Union, in Poland, but also in the region, reviewing the innovations in context their implementation into the regional economy would be extremely useful to entrepreneurs;
- the major weakness of the existing websites of the scientific institutions is their distributed character - each research center has its autonomous, closed database, with its own formatting system. The information presented there are addressed to a narrow audience: usually to students and employees of its own;
- databases and websites of R&D institutions use the hermetic, specialized language, completely incomprehensible to entrepreneurs and other stakeholders of the regional ecosystem of innovation;
- databases and websites of R&D institutions do not allow the Bi-directional transmission of information and they don't learn thanks to feedback from the readers;
- the research institutes do not define on the websites an area of potential applications, and even more, do not foresee the potential market for the research;
- websites of R&D institutions do not use the mechanisms or ICT procedures, which enable just-on-time feedback, reviewing and evaluation the R&D activities, carried out in scientific institutions.

RIC Pro-Academy is - on the one hand as a modern scientific institution, supporting business and on the other as a research institute, conducting R&D tasks in the research areas corresponding with regional smart specializations. That is why the important goal of RIC strategic goal for the 2016 year is to introduce into market the model internet platform of open access to scientific data. Model and demo of the interactive platform with the open access to data, regarding the rising of innovation will be the answer to the problems outlined above. The platform will be technologically advanced and programmatically comprehensive tool for implementing the new service supporting promotion and diffusion of open innovation paradigm in the model of open data access.

The proposed platform will meet three specific objectives:

The Objective no. I. in context of the following problems:

- Websites and databases on R&D of research intuitions in Poland are static and require the stakeholders outside the science society, especially entrepreneurs would make efforts to find and follow the information on the conducted research. This assumption is unrealistic.
- Companies do not benefit from the achievements of R&D sector because they do not know what research are conducted in scientific institutions, and traditional forms of promotion of science are inadequate and too expensive;
- Information on research and R&D activities are undeveloped, incomprehensible, did not take into account the specific needs of decision-makers in economy nor the "language benefits" and usually they come to companies too late.

The proposed inter-active platform will include a procedure of permanent monitoring the R&D achievements and sending a newsletter with information about them to enterprises according to the code of their economic activity NACE (Nomenclature of Economic Activities, the European statistical classification of economic activities). Newsletter will be distributed via platform according to the NACE which suggest that these companies can be potentially interested in implementation of the results of the research.

Of course, the newsletter should be generated in the language understandable for entrepreneurs, basing on the "language of benefits".

Objective I: Increasing access of companies to the open access data and interactive platform allowing the exchange of information and strengthen the cooperation between science and the economy, according to the paradigm of open innovation.

The Objective no. II. in context of the following problems:

- The percentage of innovative companies in Poland is very low and the Lodz region is on the last three places in Poland in this respect.
- A comprehensive system of auditing technology and evaluate the regional R&D activities in context of potential for bringing them to the market is not conducted.
- The future users of the technology, especially entrepreneurs are not engaged by R&D intuitions, not at the stage of design and creation, nor at the stage of auditing processes of commercialization.
- There is no evaluation R&D processes in relation to regional smart specialization.
- Procedures forecasting economic efficiency and competitiveness, resulting from the implementation of different types of innovation: process innovation, marketing, organizational and social innovations are little known and rarely used by companies.
- Procedures for risk assessment regarding the technology implementation are rarely implemented in the practice of enterprises.
- The benefits resulting from technology transfer and long-term business-science networking rarely take into account by both sides of the net-work.

The platform enables the development and testing the innovative ICT tools for open data access to the regional R&D sector in context of commercialization and implementation R&D results into practice in the region.

Objective II: Making stakeholders of the regional innovation ecosystem to assess the possibility of implementing innovation and R&D results into practice of enterprises, municipalities, cities and local communities on the regional level.

The Objective no. III. in context of the following problems:

- Although the annual value of Polish export of Hi-Tech products and services continuously increases, the Polish companies occupy the last place in the ranking of the European Union in terms of exports of high-tech products as share of total exports [13].
- National and regional support for the expansion of export companies with innovative products or services is limited
- There is a lack of tools for assessing the R&D potential for creating new technologies in the context of the high-technology products or services dedicated to domestic and foreign markets.
- There is no analysis of the potential threats from competitors or to identify opportunities for the development of the regional economy based on knowledge.

The platform allows for the development of innovative, auditing R&D sector tools in order to use them for creating the innovative products and services, which can be offered by the regional companies on domestic, the European Single Market or on the markets outside the EU.

Objective III: Facilitating assessment of the competitiveness of innovative products or services thanks to inter-active tools offered on the platform.

The discussed interactive platform will be equipped with ICT tools, enabling tracking and watching information on R&D intuitions websites. A very important requirement, being de facto a condition of effectiveness of planned functionalities of the platform is bound administrators of R&D websites with the open data access idea. Administrators should use – firstly - key words, identifiable by the navigation system platforms, such as "applied research", "development", "Innovation", etc., and secondly - to join information about research with the proper areas of implementation into business, assigned the research with the NACE code. The principle advantage of interactivity platform is linking the results of the research with the NACE of business activities. There is the open database of existing companies in the European regions. One can without any difficulties segregated companies database according to the criterion of NACE and adjust them to appropriate research, and finally send to selected companies a newsletter with information about ongoing R&D.

An important component of the interactive platform is an innovative tool for managing database semantics, according to the needs and level of specialization recipients of newsletters. Management information base semantics means paying attention to joining together the word, form, image and the actual content having in mind the readers of information. Semantics as a branch of science investigates whether the construction of the word determines its meaning and whether the relationship between linguistic expressions and objects to which they relate help in understanding the content that they carry.

The platform should base on synchronized relational database. Relational Database (RDB) consisting of multiple files and databases, which may cooperate with each other, have internal programming languages (SQL) by which it is possible to design the handler and data conversion. Designing the database one should take care of aspects of concurrency control and throughput. These aspects, due to their vastness and complexity, will constitute important factors determining the speed of the whole platform.

The proposed open access solution will be based on the new intelligent, semantic concept that not only enables to search for keywords, but also intelligently to assemble and to translate the contents of platforms delivered by R&D institutions, into the "language of benefits", according to the possibilities and needs of entrepreneurs. As the platform manages the programmed transmission of data and information from scientific institutions to entrepreneurs, it should have an "interpreter" of specialized, scientific, hermetic language into the popular nearly every-day language. Like many well-known translators / dictionaries of foreign languages, for example <https://translate.google.com/#en/pl>.

On the platform are scheduled tools to manage databases, which are to control the relationship between data and semantic meta data. Thanks to this approach, the automatic translation of documents, delivered by the R&D institutions will be possible. Describing the proposed project platform, it is worth pointing that there are a few solutions of the semantic web search engine, which bases on two exploration methodologies: the first one: the solution is analyzing currently accessible websites or data bases or the second methodology: the solution creates its own the semantic search engine, which is scanning networks, websites, databases and is using the original semantic algorithms for automatic transcription.

The development of the interactive platform will be determined by the position of scientific institutions so to open access to their database and semantic descriptions of their information. As examples of the existing search engines, useful for the open access to scientific database are Swoogle, Sindica and Powerset. Another important solution, consistent with the planned platform is the automatic watch-dog of selected databases and then, through the procedures of intelligent algorithms, semantic stream of input data will be converted into information expected by the end user in "language of benefits". Currently used, distributed databases, conducted by scientific institutions will be subject to the integration processes. Many different narrowly specialized databases are united into a single virtual BigDataBase in a transparent and unnoticeable to the user manner, who feels that uses one large information platform. Key challenges for handling BigDataBase Management System, which allows the use of information resources from various sources, written in different ways, at different times, etc. are unification and cybersecurity problems resolving. Inconsistencies between different data sources are the results of not only the data schemas, but the semantics, i.e. data on different websites, despite of the same meaning of data, may be presented differently because of the different approaches to scientific observation description of the same phenomena. BigDataBase Management System developed an interactive platform should take into account the following differences, observed on the R&D websites:

- First: the type of data;
- Second: the values and standard of measurement of data;
- Third: semantics, language and meanings of data;
- Fourth: the values of abandoned and missed data.

The platform, using the database of the individual research institutions will respect their autonomy and heterogeneity, local priorities, rules of ownership, rules of authorizations of access and of cybersecurity. Procedures for integration and requests for information must therefore be correctly identified and properly addressed. Only then the platform will be the useful and appropriate link between local, European and world R&D databases and stakeholders outside the academic environment expectations.

Conclusions

Open access to data, particularly to information creating by the research and development institutions that may be useful for business is on the very beginning state of development. Problems that affect the establishment of open access databases are of the varied and diverse nature: technical, social, economic specific should be taken into consideration. The most advanced initiatives of the open government data /OGD/ are currently accessible in countries with a high HDI, where human rights are fully respected - the right to information is one of the fundamental human rights.

Polish science is facing actually a huge challenge, requiring not only digitization of their intellectual resources, but also to make them available in the form of open access databases.

The research *INFO-INNO-LODZ - Evaluation of opportunities to increase the effectiveness of methods of informing about the competence and resources of regional research institutes*, conducted by the Research and Innovation Center Pro-Akademia has just identified the main problem areas that should be taken into account in the process of establishing the open access to knowledge. The answer to the problems have been diagnosed is recommended in the last part of the article – an interactive platform.

The platform, using the database of the individual research institutions will respect their autonomy and heterogeneity, local priorities, rules of ownership, rules of authorizations of access and of cybersecurity. Procedures for integration and requests for information must therefore be correctly identified and properly addressed. Only then the platform will be the useful and appropriate link between local, European and world R&D databases and stakeholders outside the academic environment expectations.

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