

SUMMARY RAPORT

Needs and expectations of young Polish scientists related to professional research career development

Warsaw, February 2018

This summary is based on a survey carried out within the "Polish ERA Mobility and Career Days" project funded under the EU research and innovation programme HORIZON 2020 and by the Polish Ministry of Science and Higher Education.



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INTRODUCTION

About the project

This summary report is one of the elements of **a project aimed at supporting career development of young researchers in Poland**. Our activities have been mainly addressed to PhD candidates – those at the early stage of a professional scientific path, being the period of conscious shaping of significant decisions related to their further professional development. We are pleased that our initiative has also raised interest among Master degree students and PhD holders.

The idea for the “Polish ERA Mobility and Career Days” project is connected with a new area of the European EURAXESS network activity introduced in 2017. Apart from supporting international mobility of researchers in Europe, the network has created various tools which aim at facilitating scientists in planning and managing their professional path. Setting goals, consequent realization of planned steps, learning to use various support instruments along with favourable development conditions are keys to a successful career. What is crucial in this respect is to consciously take up actions already at early stages of a young researcher’s life, which was the leading motto of the whole project.

The project is an initiative of the Polish EURAXESS members represented by 5 centres: National Contact Point for Research Programmes of the EU (based at the Institute of Fundamental Technological Research of the Polish Academy of Sciences) – project coordinator, University of Lodz, Cracow University of Technology, Silesian University of Technology, Poznan Science and Technology Park and Science PR company specializing in science promotion and popularization.

The project consisted of the following elements:

- **3-day “Mobility and Career Days” events** held in October 2017 in 6 Polish cities for nearly 1000 young scientists. During interactive workshops and networking sessions with 147 speakers and experts representing different sectors, background and competences, the participants could discuss various issues related to planning and developing their scientific careers with emphasis put on three aspects: international mobility, interdisciplinarity and academia-private sector collaboration.
- **A seminar for 55 Polish institutions** which received the European “HR Excellence in Research” award dedicated to the subject of creating favourable working and career development conditions for researchers in Poland.
- **The survey on career development** of young Polish scientists with participation of 399 young researchers and 78 career experts.
- **Promotional campaign** in the traditional and social media addressed not only to the scientific community but also to the Polish society, with an aim of raising their awareness of the importance of researchers’ role in the society and stressing the challenges and dilemmas the scientists face nowadays.

The whole project and its individual elements have been well received by the participants, both scientists and the experts. They underlined the fact that such initiatives should become an indispensable element in a young scientist’s calendar or even before they start their PhD studies.

Therefore, we hope that the idea will find its followers, for instance at the institutional level, even more as the awareness about the need for career development considering its versatility and existing supporting instruments are the first steps to a successful professional career and realization of scientific passion.

Anna Wiśniewska

Coordinator of the Polish EURAXESS Network

Coordinator of the PL-ERADays project

About the report

We are pleased to present the following summary of a research conducted at the end of 2017 aimed at finding out opinions, needs and expectations related to scientific career development. The survey was addressed to young Polish scientists (according to the current definition up to 35 years of age) and to career experts representing different sectors and disciplines.

The survey, which was open for one month, raised interest of nearly 800 people but the analysis is based on 477 responses (399 were provided by the young scientists) which were fully completed. The participants of the Mobility and Career Days were also asked to express their opinions on the subject when filling in event evaluation forms. Based on the collected questionnaires it can be concluded that young researchers are not fully aware of the versatility of the research career and its elements. Often they believe that obtaining their own grant as early as possible is a key to success. As a consequence they focus on searching for grant offers and learning how to write grant applications, not paying attention to other important aspects which could help them succeed in receiving attractive scholarships and research grants. Having no diversified experience and skills, they are exposed to failure which is discouraging. Similar conclusions can be drawn from the conducted research.

One of frequently raised issues was a difficulty in keeping work-life balance, also in relation to family life which is important for majority of the respondents. Most often cited factors influencing their decisions on continuing the scientific career are: having a baby (maternity leave), difficult financial situation connected with the necessity to provide for a family and the fact that scholarships/fellowships do not include a possibility to travel with family members. And what is worth stressing is that the international mobility and working abroad is considered by the young scientists an important development factor leading to a successful professional career. After the mobility experience they would like to return to the country to contribute to the development of science in Poland to increase its prestige at the international arena. Despite such an attitude more than a half of the respondents consider working abroad if they do not find appropriate conditions in Poland.

The majority of the 399 young respondents currently work in the academic sector, 14% work in both sectors simultaneously. When asked about an ideal job, the academic sector is a priority, although working only in this sector seems less important (26.8%) than working in both sectors (31.3%). At the same time as one of serious barriers in career development they perceive is a small number of job vacancies in the academic sector. Both in the survey as well as during the events the young scientists expressed their low knowledge of the non-academic sector. They claim that they do not have the skills or experience required by this sector of the job market. There is also a general belief that changing the sector is perceived negatively by the academic society as "abandoning science".

The collected responses show significant determination of the young scientists to follow their research passions and develop their scientific careers despite the many challenges they spot. Such a potential should be supported by introducing structural changes (what is currently taking place in Poland) in line with the expressed opinions, many of which seem justified. It should become a standard activity to promote various career development paths as well as tools supporting individual choice, organize meetings with more experienced researchers and mentors supporting them in creating career development plans, which take into account its multiple aspects, including the knowledge about the wide private and public administration sectors where most of them will find employment.

RESEARCH OBJECTIVES

The main objective of the study was to understand the needs and expectations of young scientists as well as obstacles related to their professional development in the national and international context, both in the academic and non-academic sectors. The specific objectives focused on **(1)** identification of strengths and weaknesses of the competences of young researchers, **(2)** evaluation of available tools supporting research career development and **(3)** finding out possible improvements in the area of education and professional development of young researchers.

METHODOLOGY

The study was carried out using a quantitative method with qualitative elements. Computer-Assisted Web Interview (CAWI) is a survey carried out with the use of on-line standardized questionnaires to be filled in by respondents: the questionnaire consisted of close-ended questions with predefined answers, and open- or semi-open-ended questions with a possibility to enter an individual opinion. Respondents' statements were recorded in the database of the survey program and then exported to a statistical program. The research used a web application called LimeSurvey.

The on-line questionnaire was available for one month, from 23 October until 20 November 2017. It was widely promoted across the country, not only by the Polish EURAXESS network but also by other national institutions.

RESPONDENTS

Population with occasional sampling¹ comprised of Polish **(1)** young scientists, mainly PhD students; **(2)** experts, i.e. employers and representatives of academic or non-academic sector actively engaged in supporting career development of researchers.

477 respondents from across the country took part in the survey, of whom nearly 84% are young researchers (In line with the Polish law a young researcher means a person of up to 35 years of age, excluding periods of lawful leaves). 52.8% of the surveyed are women. Majority of the respondents are doctoral students having the title of Master of Engineering (30.6%) or Master (29.4%). One-third of all the respondents constitute together doctors (18.7%) and habilitated doctors (12.2%). The majority represent higher education institutions (universities, universities of technology) – 73.6% and research institutes – 24.5%. One in ten respondents indicated other type of an institution i.e. a company, non-public higher education institution, private research centre/research company or a higher vocational school.

Most of the surveyed represent exact sciences (38.4%), natural sciences (37.9%) and technical sciences (37.3%). Less frequently indicated areas are: social sciences (nearly 20%), medical sciences (nearly 16%) and humanities (12.4%).

It is worth mentioning that as many as 88% of the respondents (422) decided to answer 10 open-ended and semi open-ended questions, which is rather untypical behaviour, especially due to the length of the questionnaire. Despite this, in all the cases the answers were consequently

¹ An occasional sampling understood as a non-random sampling design in which the availability of respondents plays a key role. [Frankfort-Nachmias Ch., Nachmias D., 2001: Metody badawcze w naukach społecznych. Poznań: Wydawnictwo Zysk i S-ka, p.198.]

given to all the open questions, keeping the style and length of the text. Therefore, it can be concluded that the respondents treated the survey very seriously.

RESULTS

- Competencies supporting career development

Among the 18 pre-defined competencies, analytical thinking (an ability of analysing and drawing conclusions) was pointed as the most useful skill both at domestic and international market. Other competencies marked as useful at the domestic market include: time management and coping with stress. At the international level, apart from language skills, top competencies are: ability to work with people of other cultures and working in team. The way of perceiving the useful competences in relation to both markets differs slightly because in case of the international market and non-academic sector various soft skills and teamwork score higher than skills related to expertise and ability to use specialist equipment listed as top useful competences at the domestic academic market.

Table 1. Competencies useful at the domestic and international market: average marks with reference to young scientists (n=399) and experts (n=78); competencies listed alphabetically; scale from 1 to 6 points.

Competencies	domestic market		international market	
	Young scientist	Expert	Young scientist	Expert
analytical thinking	5.16	5.37	5.44	5.41
self-presentation/public speaking	4.61	4.82	5.06	5.21
creativity	4.62	4.79	5.21	5.33
focus on continuous development of competencies	4.67	5.00	5.27	5.24
openness to changes	4.29	4.77	5.27	5.27
foreign language skills	4.40	5.09	5.67	5.59
autonomy in professional environment/being proactive	4.67	4.78	5.05	5.18
ability to work in team	4.58	4.95	5.26	5.36
ability to transfer knowledge	4.41	4.64	4.68	4.83
ability to learn fast	5.00	5.15	5.26	5.37
coping with stress	4.95	4.91	4.98	4.92
ability to work with people of other cultures	3.64	4.10	5.35	5.10
project management skills	4.50	4.50	4.92	4.87
time management skills	4.94	5.04	5.18	5.22
team management skills	4.27	4.45	4.80	4.78
using specialist tools (computer programs, technologies, procedures, specialist equipment, preparing technical documentation)	4.78	5.18	5.15	5.19
non-technical knowledge related to socio-economic and legal aspects	3.82	4.19	4.03	4.19
expertise related to the field of study/PhD dissertation	4.82	5.18	5.06	5.35

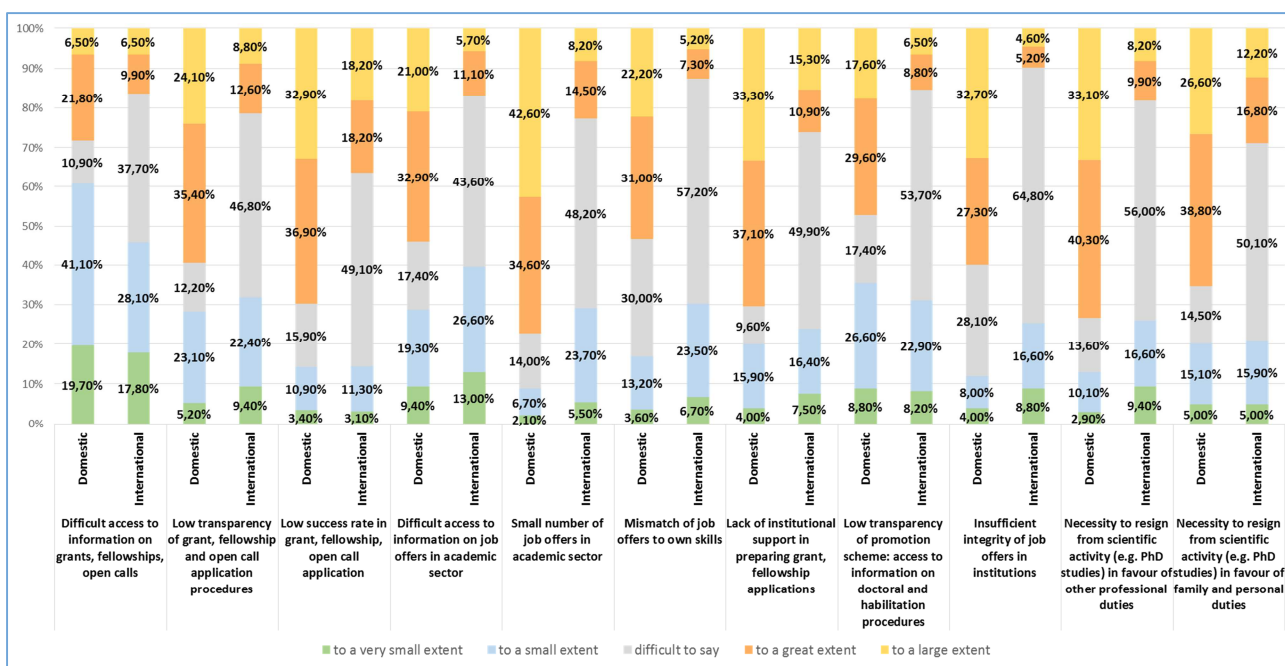
Source: own study of Research and Analysis Department, Centre for Innovation and Technology Transfer Management, Warsaw University of Technology

The young scientists consider continuous development of competencies to be an indispensable element of career development. The most frequently mentioned actions undertaken by them in case of career development are: searching for information on grants, open calls and fellowships (87.7%), international mobility (79.7%), and applying for a national grant (78.7%). Activities focused on foreign context were mentioned much less frequently: applying for a grant (35.8%) and applying for a job (25.6%). 37.6% of the respondents use their own institutional support and 31.6% of them act completely on their own in this respect. The fact that only 9.5% of the surveyed took up three or fewer activities related to their career development confirms that young researchers have a proactive approach to career development. It should be stressed, however, that the activities they take are focused mostly on applying for research grants, then on developing research-related skills. Soft skills training is marked lower.

• Obstacles in career development in the academic sector

The research shows that the most serious barriers in career development of young scientists in the Polish context are: a small number of job offers in the academic sector, low remuneration and short-term contracts. Other barriers, also at the international level, include: the necessity to resign from scientific activity (e.g. PhD studies) in favour of other professional duties, low efficiency in obtaining grants and scholarships and a lack of institutional support. Moreover, the respondents indicated difficulties in establishing a family due to an inability to reconcile professional and family duties. According to the surveyed there is no problem with access to information on grants, fellowships and open calls. A high number of “difficult to say” responses to a question about existing barriers in the academic sector at the international level suggests a lack of knowledge of the international market resulting from short-term mobility rather than longer stays abroad. An important issue influencing career development mentioned both in the open and closed questions are transparent recruitment processes and grant evaluation procedures as well as availability of open calls.

Graph 1. Barriers in career development of young researchers in the academic sector on domestic and international market (n=477)

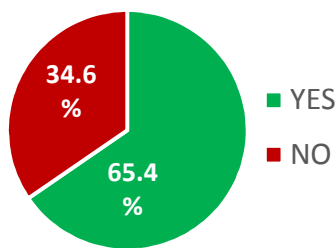


Source: own study of Research and Analysis Department, Centre for Innovation and Technology Transfer Management, Warsaw University of Technology

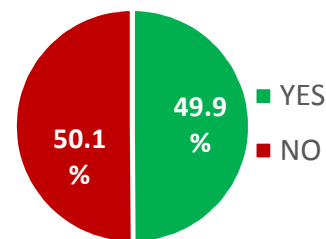
- Employment plans

When asked about their employment plans, as many as 77.7% of the young scientists prefer employment in the academic sector in the country. However, at the same time, 73% of them consider working in the Polish non-academic sector. When asked about the international labour market, 65.4% consider working in the academic sector and 49.9% in the non-academic sector. What influences their preferences in this respect is not the language barrier or lack of experience or knowledge but mainly personal matters (especially the necessity of leaving the family). It is worth noticing that a detailed analysis has not shown significant differences in this area in terms of gender. At the same time the respondents stress that working abroad is an important element of career development after which they would like to return to the country. Based on their responses it can be concluded that short-term research mobility is most beneficial for them, especially from the perspective of family life and expenses that need to be incurred when organizing the stay abroad. In the open questions young researchers wrote that they prefer to carry out research at Polish academic institutions not only for family reasons but also because they feel the mission to contribute to the development of science in Poland which gives them satisfaction.

Graph 2. Considering work in the academic sector abroad (n=399)



Graph 3. Considering work in the non-academic sector abroad (n=399)



Source: own study of Research and Analysis Department, Centre for Innovation and Technology Transfer Management, Warsaw University of Technology

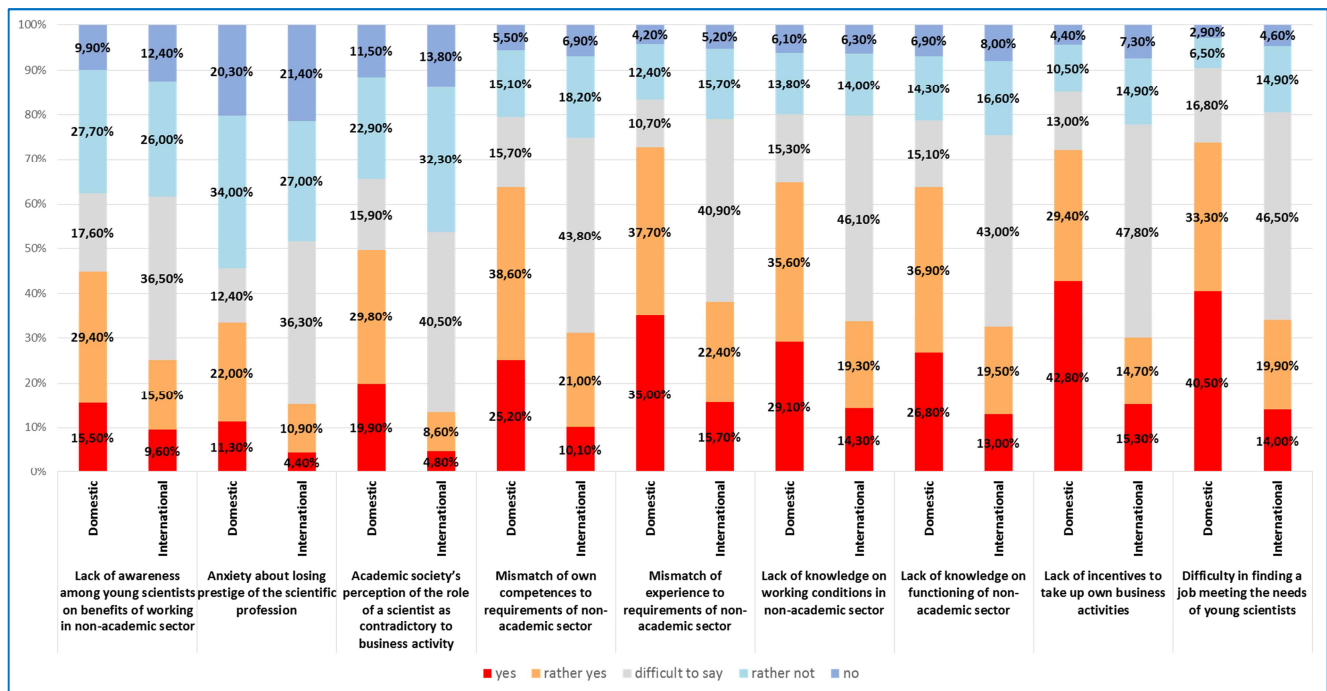
- Cooperation with non-academic sector

The majority of both young scientists and the experts recognize the benefits of cooperation between the academic and non-academic sectors. However, it is the young scientists (87.7%) that pay more attention to the benefits in comparison to the experts (75.6%). The greatest benefit of the collaboration is solving practical problems and mutual development of science and business. Also, the young scientists and experts very often indicate such advantages as: additional funding for research, commercialization and higher remuneration than in the academic sector.

The greatest barrier affecting the situation of young scientists on the domestic labour market in the non-academic sector is a difficulty in finding a job that meets the requirements of young scientists. Also, one of the most serious barriers both on the Polish and international market is inadequate experience of young scientists in relation to the experience required in the non-academic sector. Only 8% of the young researchers consider themselves well trained for the non-academic jobs (experts' opinion - 16.7%), and as many as 40.6% of them indicate that they are not ready for such a change.

In order to encourage young researchers, the non-academic sector could introduce incentives such as offering scientific development opportunities or a salary enabling life stability and also opportunities to carry out interesting projects and to work in attractive conditions.

Graph 24. Barriers in career development of young researchers in non-academic sector in the country and abroad (n=477)



Source: own study of Research and Analysis Department, Centre for Innovation and Technology Transfer Management, Warsaw University of Technology

- Tools supporting career development

The most effective activities supporting career development are research mobility and foreign internships in the academic sector. Other useful tools include networking, training and workshops in specific research fields and foreign internships in the non-academic sector, as well as working in a grant and science-business collaboration. The role of a mentor-supervisor and an experienced scientist was also underlined. The respondents also stressed the need for increasing the number of open calls for researchers who do not fit into the current "young scientist" definition (up to 35 years of age). According to the surveyed, currently they fall into a gap between the opportunities for those "young scientists" and for the advanced researchers.

The most effective supporting instruments, in the opinion of the respondents, are non-academic training companies, on-line training courses, business incubators, technology parks and technology transfer centres as well as internships in non-academic sector (mainly business and industry).

Nearly half of the young scientists **are familiar with the EURAXESS portal and services (49.1%)**, of whom 40% use the portal. The best assessed aspect of the portal is job vacancies database (total amount of good and rather good marks: 74.4%).

SUPPORTING RESEARCH CAREERS – RECOMMENDATIONS

Ensuring staff to support scientific research, both administrative and technical staff (i.e. technical staff supporting laboratory work) and specialists in the field of R&D solutions, commercialization and technology transfer. Building a team providing effective support for young scientists in all stages of career development, for instance in case of grants – support through the whole process: from application, via research activities, implementation, final financial settlement and searching for further financial mechanisms.

Perspective planning of: scientific research, employment (promotion) and teaching activity. The respondents positively evaluated an example of the National Science Centre in Poland and its scientific development path: from smaller national projects to larger international grants. More transparent employment procedures at universities can positively affect the perception on the promotion procedures, currently assessed as “not objective”. Also more effective management of teaching tasks would enable rational planning of all elements of the academic work i.e. research, international mobility, internships, and additional inter-sectoral projects.

Employment and salary continuation and providing solutions supporting smooth transition between contracts and projects (grants). It can be concluded that young scientists do not mind temporary employment itself (grants, contracts), but they are worried mostly about the resulting breaks in employment between the contracts and the lack of continuity, which makes life planning and stability difficult.

Supporting work-life balance includes activities in various areas of university management, mainly consisting of: ensuring employment continuity, planning teaching activity in advance and ensuring effective administrative support for carrying out research grants. Another solution introduced at some universities are nurseries and kindergartens, providing care for children and allowing young parents to return to work.

Effective university management and better organization. Less time-consuming bureaucracy which would allow for more dynamic cooperation with external stakeholders.

Employee motivation and evaluation system suited to specific duties, allowing to assess an area of actual activity. Scientists specializing in teaching should be assessed on the basis of this activity, and scientists specializing in research – based on grants and publications.

Mentoring and integration of ‘young’ staff in ‘old’ structures. Success in science is based largely on effective research teams composed of experienced scientists and young staff who, even though they are still learning, know latest tools and have a fresh approach to offer. Improving mutual trust and change in mentality (young scientists seen as a vital support for the team, not as competition).

Introducing additional or increasing the number of existing financial instruments:

- for young scientists returning to the country,
- for young scientists returning to science after a break (i.e. business activity, internships or maternity leave),
- for young scientists who want to work simultaneously in science and business (i.e. market application projects, internships in non-academic sector),

- for researchers without a possibility of taking a long mobility away from their place of residence (i.e. short study visits/mobility, short internships abroad).

Connecting academic career with professional activity in non-academic sector could be strengthened by developing forms of collaboration mutually beneficial to science and business, i.e. science projects aimed at business needs finalized by co-authored scientific publications or engaging business representatives in academic teaching.

Networking of young scientists with mentors in both science and business. Young scientists should be supported not only by being provided with networking opportunities, but also by being taught how to do it and make it an effective tool for their own development.

Promoting the scientific profession in the non-academic sector, explaining to entrepreneurs that a scientist in business can translate into a competitive advantage. Building on the success of the PL-ERADays project, the challenge of changing the attitudes can be addressed by such activities as:

- promoting the researcher profession as an interesting life idea, supporting its prestige despite low funding (building on young scientists' passion for science, their strong beliefs in the need of pursuing scientific career, as well as willingness to contribute to development of science in Poland);
- explaining that the prestige of the profession is not always connected to "pure academic science", but often to successful cooperation with non-academic sector: practical applications, patents, innovative solutions;
- showing entrepreneurs the benefits of employing a researcher in a company (who having different experience offers not only a different perspective, but also analytical skills and is trained in result-oriented work);
- supporting entrepreneurs in hiring researchers (i.e. regularly promoting jobs with a possibility to pursue a scientific career or a path of consecutive temporary contracts);
- promoting not only the idea of starting one's own business (start-ups), but the need for continuing the business path even after possible failures (changing the perception of a start-up failure as the final failure into a perception of a lesson learned leading to further successful initiatives).

CONTEXT OF THE RESEARCH

The research was conducted by the Department of Research and Analysis in the Centre for Innovation and Technology Transfer Management at Warsaw University of Technology for the National Contact Point for Research Programmes of the European Union, Institute of Fundamental Technological Research of the Polish Academy of Sciences, the PL-ERADays project coordinator (Agreement 6/DBA/2017).

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