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SCOUTING IN THE PROCESS OF KNOWLEDGE COMMERCIALISATION – EMPIRICAL RESEARCH

SCOUTING W PROCESIE KOMERCJALIZACJI WIEDZY – BADANIA EMPIRYCZNE

Abstract: The article presents the results of a pilot study, aiming to assess the functioning of knowledge scouting in universities of the Silesian Voivodeship. Scouting is a method of identifying scientific projects with high market potential. This is one of the issues related to knowledge commercialisation, especially in this process's initial stage. The article presents the definition of knowledge scouting and the scope of scouting work in creating supply and demand for rese-

arch. Unfortunately, only a small percentage of universities use knowledge scouting. It focuses mainly on identifying the possibilities of commercialising the university's scientific potential, even omitting tasks related to building and maintaining relationships with university employees and business partners. And this, unfortunately, contributes to the limited possibilities of cooperation between science and business practice. The article also points out problems that contribute to the discussion around commercialising scientific research results.

Keywords: knowledge commercialisation, intellectual potential, scouting, technology transfer, university, knowledge

Streszczenie: Artykuł prezentuje wyniki badania pilotażowego, którego **c**elem była ocena funkcjonowania scoutingu wiedzy w uczelniach województwa śląskiego. Scouting to metoda identyfikacji projektów naukowych, które charakteryzują się wysokim potencjałem rynkowym. Jest to jedno z zagadnień związanych z komercjalizacją wiedzy, a szczególnie z początkowym etapem tego procesu. W artykule przedstawiono definicję scoutignu wiedzy oraz zakres prac scoutów w obszarze kreowania podaży i popytu na badania. Niestety, scouting wiedzy jest wykorzystywany przez niewielki odsetek uczelni. Koncentruje się głównie na identyfikacji możliwości komercjalizacji potencjału naukowego uczelni, pomijając wręcz zadania związane z budowaniem i utrzymywaniem relacji z pracownikami uczelni i partnerami biznesowymi. A to niestety przyczynia się do ograniczonych możliwości współpracy nauki z praktyką biznesową. Wskazano również na problemy, które stanowią przyczynek do dyskusji wokół komercjalizacji wyników badań naukowych.

Słowa kluczowe: komercjalizacja wiedzy, potencjał intelektualny, scouting, transfer technologii, uczelnia, wiedza

Introduction

The university no longer performs just scientific and didactic functions; its mission is to create and stimulate innovation[1]. Universities that create knowledge are becoming essential partners for modern enterprises. The statement that "knowledge is of particular importance when it can be used in practice"[2] is an excellent justification for cooperation between science and business. In the modern economy, universities are important participants in knowledge sharing. They create knowledge and transfer it to the environment through scientific publications and didactic activities. Currently, these traditional communication channels with the environment are supplemented with new forms of university participation in the circulation of knowledge.

[1] M. Czyżewska, T. Skica, *Współczesne modele rynków pracy naukowców na świecie jako pochodna modeli szkolnictwa wyższego*, [w:] S. Waltoś, A. Rozmus (ed.), *Kariera naukowa w Polsce. Warunki prawne, społeczne i ekonomiczne*, Wolters Kluwer Polska, Warszawa 2012, p. 43.

[2] L. Woźniak, *Staże narzędziem intensyfikacji współpracy nauki i przemysłu. Wpływ współpracy przemysłu i nauki na wzrost konkurencyjności województwa podkarpackiego*, Agencja Reklamowa Nowomowa, Rzeszów 2014.

One of the most frequently described is the commercialisation of knowledge as part of business ventures. Although in practice, it takes various forms, in each of them, it causes direct contact between the subjects of science and the area of economy[3].

Therefore, there is a legitimate need to build and strengthen the bridge between science and industry. This is achieved through various university organisational solutions, such as technology transfer centres, science and technology parks, business incubators, or business roundtables[4].

Technological scouting or knowledge scouting is one of the instruments to improve and intensify cooperation between universities and enterprises. The article presents *scouting* as a tool for building open dialogue and lasting relations between the university and partners from the enterprise sector. The benefits of cooperation between science and the business sector for innovation development are essential for many universities. *Knowledge scouting* is a fundamental tool for identifying and analysing scientific research from the point of view of its commercial potential. It is a process focusing on the one hand on the systemic identification, monitoring, and assessment of the commercial potential of research work, on the other hand focusing on the search for business partners for scientific teams to develop joint innovation ventures[5]. For this reason, the issue of the use of knowledge scouting in universities is interesting and topical. The study attempted to assess the functioning of scouting among universities of the Silesian Voivodeship.

University knowledge scouting

Technological scouting can be most simply defined as a system for identifying, monitoring, and assessing the commercial potential of innovative solutions or research results[6]. It can be targeted at specific technologies or non-targeted, identifying technology gaps or markets not yet supported by the entity. A critical element of technological scouting is the use of formal, but also informal sources of information, including personal contacts of scouts. "Scouting" thus means as it were, "going out into the field", beyond the boundaries of an organisation and formal contacts in order to develop technology and its business applications[7].

[3] M. Wiśniewska, P. Głodek, D. Trzmielak, *Wdrażanie scoutingu wiedzy w polskiej uczelni wyższej. Aspekty praktyczne*, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2015, p. 8.

[4] K. Brendzel-Skowera, *Współpraca instytucji naukowych i przedsiębiorstw. Przypadek regionu częstochowskiego*, „Zeszyty Naukowe Wyższej szkoły Bankowej w Poznaniu" 2017, nr 4, pp. 121-139.

[5] E. Gwarda-Gruszczyńska, *Scouting technologiczny jako instrument wspierania współpracy nauki i biznesu w regionie*, „Przedsiębiorczość i Zarządzanie" 2016, t. 17, nr 2, pp. 275-286.

[6] E. Gwarda-Gruszczyńska, *Scouting technologiczny jako instrument…*, p. 284; R. Rohrbeck, *Harnessing a Network of Experts for Competitive Advantage: Technology Scouting in the ICT Industry*, "R&D Management" 2010, No. 2, pp. 169-180.

[7] A. Casti, C. Genet, *Principal investigators as scientific entrepreneurs*, "Journals Technology Transfer" 2014, No. 39, pp. 11-32.

University knowledge scouting consists of concentrating the scout team's effort on obtaining, on the one hand, information about the state of knowledge within the university [8] and on the other hand, information about the market demand for new solutions[9]. The key is to know the potential of the university's knowledge. This challenge requires systematic work carried out directly with research and scientific employees. Regular meetings with scientists allow for obtaining helpful information about the activities of a given scientist or scientific team. The scout's task is to get to know, among others, the scope of research and scientific work and areas of competence of university employees and to identify opportunities for knowledge commercialisation and possible areas of cooperation with the economic environment of the university[10]. Using a scouting process based on the open innovation paradigm, technology and sector experts were involved in the identification of new technologies[11].

To bring the expected results, the network of scouts requires cooperation with other organisational units of the university established for knowledge commercialisation. An example of such units are **technology transfer centres (TTC)** operating in most universities in Poland. These are units operating at the junction of the areas of science and business. They are intended to provide a kind of buffer to reconcile the knowledge commercialisation, research, and teaching activities at universities[12]. Technology scouting is an important feeder for technology roadmapping in order to avoid blind spots, and help create a realistic view of what is the current state of the art and what technologies are being worked on by others[13]. Technology scouting is an important feeder for technology roadmapping in order to avoid blind spots, and help create a realistic view of what is the current state of the art and what technologies are being worked on by others. The scope of tasks is extensive and covers the entire spectrum of activities related to knowledge commercialisation, training, information on methods and ways of knowledge commercialisation, and dedicated consulting for scientists and enterprises. TTC's actions are very often supported by[14]: a dean's representative for business/envi-

[8] R. Rohrbeck, *Harnessing…*, p. 173.
[9] C.H. Wang, X.I. Quan *The Role of External Technology Scouting in Inbound Open Innovation Generation: Evidence from High-Technology Industries*, "IEEE Transactions on Engineering Managament" 2021, No. 6, pp. 1558-1569.
[10] R. Rohrbeck, *Harnessing…*, p. 64.
[11] M. Stute, S. Sardesai, M. Parlings, P.P. Senna, R. Fornasiero, S. Balech, *Technology Scouting to Accelerate Innovayion in Supply Chain* [in:] R. Fornasiero, S. Sardesai, A.C. Barros, A. Matopoulos (ed.), *Next Generation Supply Chains. A Roadmap for Research and Innovation*, Springer, Cham 2021, p. 130.
[12] A. Casti, C. Genet, *Principal…*, p. 28.
[13] O.L de Weck, *Technology Scouting* [in] *Technology Roadmapping and Development*, Springer, Cham 2022, pp. 395-424.
[14] P. Głodek, M. Wiśniewska, *Uczelniany scouting wiedzy jako element systemu komercjalizacji wiedzy w ramach uczelni wyższej*, „Ekonomiczne Problemy Usług. Zeszyty Naukowe Uniwersytetu Szczecińskiego" 2015, No. 121, pp. 279-292.

ronment relations, a rector's representative for business/environment relations, an innovation broker, a business incubator, and university databases (Table 1).

Table 1. The importance of university units in the process of knowledge commercialisation
Tabela 1. Znaczenie uczelnianych jednostek w procesie komercjalizacji wiedzy

	Searching for new knowledge	**Assessment, selection**	**Knowledge transfer**	**After transfer**
Dean's representative	+	+	-	+
Rector's representative	-	-	-	-
Innovation broker	+	++	+++	-
University databases	+	-	-	-
TTC	+	+++	+++	+
Incubator	-/+	-/+	+	+++
Knowledge scouting	+++	++	+	-

- not used, + low effectiveness, ++ moderate effectiveness, +++ high effectiveness

Source: P. Głodek, M. Wieśniewska, *Uczelniany scouting wiedzy jako element systemu komercjalizacji wiedzy w ramach uczelni wyższej*, „Economic Problems of Services. Scientific Journals of the University of Szczecin" 2015, No. 121, pp. 281-282.

A critical stage in the process of knowledge commercialisation is its search. Here, the network of scouts, which focuses on the search for useful knowledge, acquires particular importance. Therefore, it is possible to supplement the management model of knowledge commercialisation[15] based on university scouting.

Tasks and competencies of scouts

The area of their work determines the tasks and roles of university scouts. Activities undertaken within the university are related to the following tasks[16]:

– recognition of the research potential of the university
– collecting information and knowledge necessary to assess the usefulness of scientific research for business practice and to assess the commercial potential of the research conducted,
– monitoring of collected data,

[15] I. Łącka, *Technological Cooperation Between Scientific and Research Institutions and Companies as a Condition of the Growth of Innovativeness and Competitiveness of Polish Economy*, „Economics and Management" 2013, No. 18, pp. 67-82.
[16] J. Nesterak, Z. Gródek-Szostak, *Public Funded Instruments of Support for the Internationalisation of Innovative Enterprises – A Case Study of Poland and Slovakia*, "Acta Oeconomica Universitatis Selye" 2016, No. 5, pp. 134-143.

– building relationships with university employees,
– building network relations within a team of scouts.

The scout is also required to be active in the area of the university's economic environment. Therefore, the scout's work must be directed to[17]:

- identification of industries, business profiles, and technologies used in business practice,
- analysis of potential applications of research conducted at the university in identified enterprises,
- building relationships with enterprises.

Therefore, scout takes action on scientific research's supply and demand side. For scouting to bring positive results, it is essential to treat researchers and entrepreneurs as customers. Due to the specificity of contacts between the areas of science and business, it is necessary to take a professional, caring approach to each of them. The scout's customers in the area of creating economically beneficial knowledge are, among others[18]: scientists, research teams, deans of faculties, and university authorities. Relations with scientists are crucial for the success of knowledge commercialisation and trust should be at its root. A scientist must have confidence in the person to whom he will entrust his ideas. The scout should collect as much information as possible about the scientific work of the person he intends to meet. Building relations with academics must be based on professionalism, because only in this way will it be possible to assess the commercial potential of the conducted research and prepare the commercial offer of the university[19]. On the other hand, there is the entrepreneur. It is also a demanding customer for whom time, profit, and cost categories are essential and assesses possible cooperation with the university regarding its impact on the company's competitive position. In creating demand for scientific research, it is crucial to professionally prepare the scout for the conversation and reach the right person in the company.

Taking into account the above tasks, a scout must be characterised by specific competencies that are very similar in the area of supply and demand of scientific research. Acting in the university and its surroundings, the scout must first have appropriate knowledge of the commercialisation process[20]. Since university scouting is mainly about building relationships, communication, public presentation, and teamwork skills are very important. In collecting information, analytical skills are required, related primarily to qualitative analysis, synthesis, or drawing conclusions.

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[17] T. Baycan, R.R. Stough, *Bridging knowledge to commercialization: the good, the bad and the challenging*, "The Annals of Regional Science" 2013, No. 50, pp. 367-405.

[18] D. Goktepe-Hulten, P.P. Mahagaonkar, *Inventing and patenting activities of scientist: in the expectation of money or reputation?*, "The Journal of Technology Transfer" 2010, No. 35, pp. 401-423.

[19] R. Barski, T. Cook, *Metoda identyfikacji projektów do komercjalizacji na wyższych uczelniach*, Zielona Góra/Oxford: PARP, 2011.

[20] D.S. Siegel, M. Wright, *Academic Entrepreneurship: Time for a Rethink?*, "British Journal Management" 2015, No. 26, pp. 582-595.

The scout's areas of activity may also require him to think outside the box and contact with new solutions and look for applications of creative thinking for them[21].

Research methodology

The study aimed to determine to what extent universities use knowledge scouting and to assess the functioning of the scouting network in universities. The presented empirical research included two stages. The first stage, i.e., the survey, was conducted in March 2022 using the interankiety.pl platform in a group of ten public academic centres of the Silesian Voivodeship, with a technical and economic profile. The purpose of this stage was to separate the universities that use scouting. Four universities were classified into the second research stage – three technical and one economic. Then, from May to July 2022, direct interviews were conducted with employees involved in commercialising knowledge using a survey questionnaire. It consisted of open and closed questions (with a 5-point Likert scale for assessing individual phenomena, where: 1 meant the lowest rating and 5 – the highest rating).

The research consisted in a pilot study. They allowed determining the level of use of scouting in universities and allowed to illustrate the conditions of the scout's work. On this basis, it is possible to modify the survey questionnaire regarding its transparency and intelligibility. Thanks to this, it will be possible to continue research in a group of technical and economic universities in Poland.

The following research questions were formulated:

1. To what extent is knowledge scouting used in universities?
2. Does scouting fill the gap in the process of knowledge commercialisation?
3. What are the main factors that favour and inhibit the development of scouting in universities?

For the purposes of the study, specific areas of scout activity were defined, i.e.:

In the field of creating the supply of research:

- D1. Recognition of the research potential of the university.
- D2. Assessment of the commercial potential of research work.
- D3. Creating a commercial offer of the university.
- D4. Monitoring of collected data and information.
- D5. Building relationships with academics.

In the field of creating demand for research

- D6. Market recognition.
- D7. Analysis of the potential of application of research works.
- D8. Building relationships with enterprises.

[21] M. Wiśniewska, P. Głodek, D. Trzmielak, *Wdrażanie scoutingu wiedzy…*, pp. 117-126.

Subsequently, a list of scout tasks was developed, the degree and conditions of implementation allowed to assess the functioning of university scouting (Table 2). The execution of the tasks was evaluated on a 5-point scale, where: 1 meant the lowest rating and 5 – the highest rating.

Table 2. Criteria for assessing the functioning of university scouting
Tabela 2. Kryteria oceny funkcjonowania scoutingu uczelnianego

	Areas of activity in the field of creating research supply
	Recognition of the research potential of the university (D1)
Tasks	Browsing databases on publications and scientific research conducted by university employees
	Conducting interviews with selected researchers to identify the scope of research and scientific work carried out
	Assessment of the commercial potential of research work (D2)
	Participation in conferences and other specialist meetings
	Browsing and analysing publicly available databases on the functioning companies in the field of research disciplines in which scout specialises
	Searching for and establishing contacts with potential business partners
	Conducting a preliminary assessment of scientific papers in terms of their potential for commercialisation
	Creating a commercial university offer (D3)
	Creating documentation of undertaken activities
	Formulation of cooperation offers for potential business partners based on project and research evaluations
	Monitoring of collected data and information (D4)
	Replenishment of the database on research and scientific works carried out by researchers
	Cyclical verification of database completeness and its update
	Building relationships with researchers (D5)
	Regular visits to university units and individual research and academic staff
	Maintaining contact with university employees and representatives of university authorities and university units and organisations

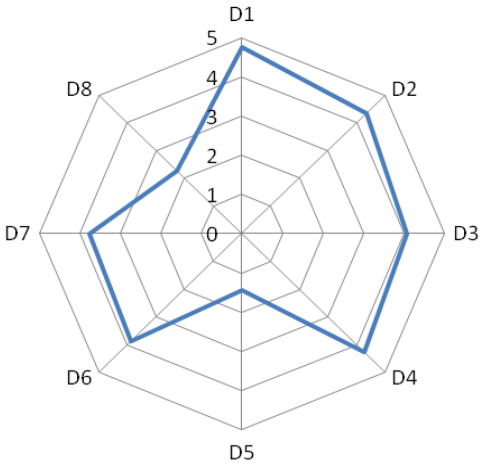
Tasks	**Areas of activity in the field of creating demand for research**
	Market recognition (D6)
	Analysis of available databases on operating enterprises within relevant industries
	Searching for potential business partners by establishing contacts with organisations gathering enterprises
	Establishing direct contacts with potential business partners.
	Initiating cooperation between the university and enterprises
	Analysis of the potential of research (D7)
	Searching for sources of information on possible applications of scientific and research works submitted by the university, monitoring the environment due to emerging trends regarding the use of technology in connection with the university's R&D works
	Building relationships with enterprises (D8)
	Regular visits to enterprises
	Maintaining contact with representatives of the enterprise sector
	Participation in specialist conferences, fairs, and other events networking entrepreneurs

Source: the author's own development based on M. Wiśniewska, P. Głodek, D. Trzmielak, *Wdrażanie scoutingu wiedzy w polskiej uczelni wyższej. Aspekty praktyczne*, Publishing House of the University of Lodz, Łódź 2015, pp. 117-126.

Study results and discussion

Knowledge scouting is still little used by universities. Of the ten universities of the Silesian Voivodeship selected for the study, only four (three technical and one economic) declared using activities that can be classified as knowledge scouting. The results from the second stage of the study indicated that only in one university we are dealing with a typical knowledge scouting.

Figure 1. Assessment of the functioning of university scouting
Rysunek 1. Ocena funkcjonowania scoutingu uczelnianego



Source: author's own study.

Based on the research results, it can be concluded that university scouting boils down primarily to activities in the area of creating the research supply (Fig. 1). To the greatest extent, activities related to recognising the university's research potential (D1) and assessing the commercial potential of research works (D2) are carried out. However, no importance is attached to building and maintaining research relationships (D5). This area of activity received the lowest average rating of 1.45.

Tasks with an average rating of more than 4 were considered to be mainly carried out by scouts. These are: browsing databases on publications, scientific research conducted by university employees (4.80); participation in conferences and other specialist meetings (4.40); viewing and analysing publicly available databases on functioning companies in the field of research disciplines in which scout specialises (4.35); conducting a preliminary assessment of scientific papers in terms of their potential for commercialisation (4.05); creating documentation of undertaken activities (4.05); cyclical verification of the completeness of the database and its updating (4.15) and analysis of available databases on operating enterprises within the relevant industries (4.05).

The tasks carried out to the most minor extent are the ones related to: building and maintaining relations with both internal and external customers, i.e., with academics (3.15) and business partners (2.75), and initiating cooperation between the university and enterprises (2,45). This is a worrying phenomenon because even the best-prepared university offer regarding the commercialisation of research may not be interesting for the market. Of course, these tasks can be carried out by innovation brokers. On the other hand, the scouts have the most

significant knowledge about the scientific potential of the university and should actively build relationships with enterprises or other business partners. Similarly, the low involvement of scouts in maintaining contacts with university employees and representatives of university authorities and university units and organisations is worrying. This critical task translates into a complete picture of ideas and scientific projects implemented at the university.

Issues to discuss

The presented study indicates that universities of the Silesian Voivodeship use knowledge scouting to a small extent. And yet, for the success of the entire commercialisation process, a reliable assessment of scientific works is crucial, enabling the verification of market potential. This allows for preparing a professional and detailed university offer in this area. In this aspect, the role of the scout is beneficial. The study results indicate that scouting focuses on identifying the potential of the university, which allows for the proper development of offers for knowledge commercialisation but marginalises maintaining relations with researchers as well as potential business partners. Not attaching importance to searching for and establishing contacts with business practice is one of the reasons for the low level of initiating cooperation between the university and enterprises. In such a situation, the best-developed offer of the university will not find interest on the market. Unfortunately, it should be stated that scouting fills the gap in knowledge commercialisation to a limited extent.

It is also wrong to reduce scouting to the active attitude of some researchers who cooperate with entrepreneurs, often using informal contacts. This is an example of entrepreneurial attitudes in the academic environment, the purpose of which is to implement the results of scientific work into the industry. However, these are activities of limited – individual scope, requiring a very energetic attitude from a scientist. The task of scouts is to identify scientific works and assess their commercial potential on a university-wide scale. It should be emphasised that in the conditions of such prominent organisations as a university, it is required to create a team of scouts. This is justified by the number of researchers employed and the additional possibility of knowledge flow, strengthening the learning process and stimulating creativity.

Research indicates that scouting is not sufficiently used to support the process of knowledge commercialisation in creating demand for scientific research. This may be due to inadequate preparation of scouts regarding competence and skills. It would be advisable for candidates for the scout role to know the commercialisation process. They should also have experience in this area, so the question arises: is it scientific or business experience? The candidate should be required to have specific

personality predispositions, including the ability to navigate the world of science and business, a high level of internal motivation, systematic skills, independent work, perseverance, self-control, or openness to change. Finding a candidate who meets these requirements is very difficult. Therefore, it would be advisable to adopt the fulfilment of a minimum number of conditions in the recruitment process. On the other hand, preparing a scout for work should focus on expanding/supplementing other requirements and becoming aware of the goals and tasks of scouting, acquiring the ability to positively shape the image of oneself and the university represented, the ability to communicate, build relationships and creative thinking [13, 12]. Therefore, the key is to find the right candidates for the scout role.

The obtained results justify the continuation of research on a broader scope of using university knowledge scouting. The research should include such issues as: the location of the scout team in the structure of the university, the method of financing, the form of employment, the time dimension, the criteria for selecting candidates, the coordination of work, and the methods of motivation.

Summary

Knowledge commercialisation is still a new area of activity for many universities, which can contribute to the development and increase of reputation but can also entail adverse consequences. Building a commercialisation system is complex, depending on many factors inside the university and in its environment. It should be emphasised, however, that commercialisation always begins with identifying economically useful knowledge in any scientific institution. This requires obtaining information about the university's resources, i.e., the knowledge created, and verifying it in terms of the possibility of cooperation with enterprises. Scouting is a tool that can effectively support this stage of knowledge commercialisation, although it does not bypass all the barriers associated with this area of activity. This study only indicates the key problems related to knowledge scouting, which contribute to the discussion around the commercialisation of scientific research results.

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