MODERN MANAGEMENT REVIEW **2016**
MMR, vol. XXI, 23 (2/2016), pp. 53-66 **April-June**

T. Bartosz KALINOWSKI[1]

INCREASING THE POTENTIAL FOR COMMERCIALISATION OF INNOVATION AND RESEARCH RESULTS WITHIN POLISH UNIVERSITIES

The article proposes an approach to improve commercialisation potential of Polish universities. Commercialisation will be understood in the paper in a broad way as the process of introducing a new product or production method into commerce – making it available on the market. The article focuses on three dimensions of commercialisation related issues. Firstly, it addresses the weaknesses of the current system that can be observed within universities. Secondly, it demonstrates an example of using technology scouting as an approach to overcome some of the identified obstacles. Finally, it describes the methodology supporting scouting and overall commercialisation processes with empirically confirmed usability. Establishing active / pull (aimed at identification and monitoring of knowledge creation at different levels of a university), instead of passive / push (based on reports from the academic staff) approach to commercialisation could be a key to effective commercialisation. Furthermore, the required characteristics should aim at: openness of the scientific environment for collaboration and knowledge sharing with business practice, building capacity for academic entrepreneurship and developing academic staff experience in commercialisation. The approach proposed in the paper can be useful for designing commercialisation processes within different universities. The publication is novel in terms of analysing scouting implementation experiences in Polish universities and research results on the usability of a methodology to support commercialisation processes.

Keywords: commercialisation, technology transfer, innovation, scouting, Quicklook methodology

1. INTRODUCTION

The present knowledge economy increasingly requires the accumulation and use of new knowledge as a key factor conditioning sustainable economic growth[2]. For this reason, many initiatives (academic, business and political) are aimed at developing new knowledge and increase the level of its commercial use. Commercialisation will be understood in the paper in a broad way as the process of introducing a new product or production method into commerce – making it available on the market[3]. The global trends indicate that the development and commercialisation of knowledge, although initiated locally is becoming a global, exponentially growing process, independent from geographical

[1] Corresponding author: T. Bartosz Kalinowski, Faculty of Management, University of Lodz, Matejki 22/26, 90–237 Łódź, tel.: 042 635 62 81; e-mail: tbkalinowski@uni.lodz.pl

[2] L. Zienkowski, *Gospodarka oparta na wiedzy - mit czy rzeczywistość*, [in:] *Wiedza a wzrost gospodarczy*, red. L. Zienkowski, Scholar, Warszawa 2003, p. 13–32.

[3] V.K. Jolly, *Commercializing New Technologies: Getting from Mind to Market*, Harvard Business School Press, Boston, Massachusetts 1997, p. 1–31.

borders[4]. At the same time in Poland, scholars and commercialisation practitioners, indicate the existence of qualitative and quantitative predominance of barriers over the drivers of commercialisation, which definitely hampers the development of the inventions and research results transfer and commercialisation system for the new knowledge[5].

2. WEAKNESSES OF RESEARCH RESULTS TRANSFER SYSTEM

The universities are identified as entities that can especially contribute to the development of economically useful knowledge, however their potential remains poorly utilized, mainly due to inefficient or incidental cooperation processes between academia and business practice. This situation stays in contrary to general trends aiming at obtaining more systematic approach, which would allow supporting knowledge commercialisation continuously, yet ensure long-term economic growth.

Despite the broad indication of importance of the academic entrepreneurship[6], literature reports unsatisfactory benefits derived from those activities[7] in terms of efficiency of invested funds (both public and private) as well as the process results. A similar situation can be observed in many European countries, including Poland, where commercialisation results are unsatisfactory compared to developed economies. Moreover, evidence also shows abnormally low rate of research results implementation funded from public grants, meanwhile various groups of stakeholders expect a more significant impact of universities on economic changes.

Developing the mission of universities towards entrepreneurship results from the rising socio-economic pressure for more effective use of accumulated academic knowledge and resources. Building an entrepreneurial orientation requires universities to:

- Participate pro-actively in the socio-economic development of regions[8].
- Create numerous and permanent cooperation links between academia and business in various areas of knowledge and intensive cooperation between science and business practice[9].
- Seek for additional funding sources in response to the declining amount of public subsidies for science[10].

---

[4] D. Audretsch, T. Aldridge, *Scientist commercialization as conduit of knowledge spillovers*, "Annals Of Regional Science" 43/4 (2009), p. 897–905; B.W. Zehner, D. Trzmielak, E. Gwarda-Gruszczyńska, *Value Creation via Technology Commercialisation International Education Programs American and Polish Perspectives Based on Experience*, University of Bratislava, Bratislava 2011, p. 22–31.

[5] K.B. Matusiak, J. Guliński, *System transferu technologii i komercjalizacji wiedzy w Polsce – siły motoryczne i bariery*, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2010, s. 21–45; E. Stawasz, *Rozwój badań nad innowacyjnością małych i średnich przedsiębiorstw w Polsce*, "Folia Economica" 2010/234, s. 125–136.

[6] S. Schane, *Academic Entrepreneurship. University Spinoffs and Wealth Creation*, Edward Elgar, Cheltenham–Northampton 2004, p. 123–141.

[7] K.B. Matusiak, J. Guliński, *System transferu technologii i komercjalizacji wiedzy w Polsce – siły motoryczne i bariery*, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2010, p. 62–65.

[8] B.R. Clark, *Creating Entrepreneurial Universities, Organizational Pathways of Transformation*, Emerald, Bingley 2008, s. 91–102.

[9] H. Etzkowitz, *The Norms of Entrepreneurial Science: Cognitive Effects of the New University-Industry Linkages*, "Research Policy" 27/8 (1998), p. 823–833.

[10] V. Chiesa, A. Piccaluga, *Exploitation and Diffusion of Public Research: The Case of Academic Spin-off Companies in Italy*, "R&D Management" 30/4 (2000), p. 329–339.

The scientific environment values basic research higher than applied research[11]. The belief that "real science" refers to basic research hinders the process of commercialisation of knowledge. There is also an opinion that the commercialisation should take place outside the academia and the universities should rather focus on the beneficial transfer of ideas on the outside, than search for commercialisation pathways.

The universities using a variety of tools can support the commercialisation of inventions and research results and develop entrepreneurial function. Development of business ventures in academic context does not have a long tradition in Europe[12]. In Poland it can be associated with provisions of the Law on Higher Education introduced in 2005 with further amendments in 2011 and 2014 (implementing the latest regulations on academic entrepreneurship and commercialisation, described in the introduction).

The conditions for the universities to play the expected role, as the suppliers of new products and services, can be stated as:

- Building awareness of real problems faced by companies and their customers.
- Overcoming legislative and administrative obstacles, as well as improving and simplifying decision-making processes regarding commercialisation.
- Ensuring appropriate valuation of the inventions and research results, as well as funds regarding adequate, geographical protection of intellectual property.
- Changing awareness of the management teams, both on the level of universities, as well as individual faculties or departments, related to the importance and long-term benefits of commercialisation.
- Changing of the incentive system that would reward to a greater extent commercialisations attempts than patents and publications.

Reports describing the commercialisation aspects of research results[13] state the following external and internal obstacles for effective commercialisation processes:

- Lack of interest in innovation from businesses.
- Low development of innovation culture and little experience in the field of cooperation between business and science and vice versa.
- Weak development of financial markets in financing innovation.
- Low attractiveness of the supply side, the weakness of the research results tranfer mechanisms, lack of suitably effective policy of market regulation.
- Lack of clear rules for accounting of costs and revenues from the commercialisation and internal locking mechanisms in universities.
- Availability of multiple sources of financing in universities and lack of compulsion to seek long-term incomes from commercialisation.

Regardless of the described barriers, the main question remains – how to develop an effective commercialisation system able to provide inventions and research results meeting market requirements along with creating a link between academia and business practice? The answers to the question can be: technology scouting.

---

[11] K.B. Matusiak, J. Guliński, *System transferu technologii i komercjalizacji wiedzy w Polsce – siły motoryczne i bariery*, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2010, s. 42–35.

[12] B.R. Clark, *op. cit*., p. 215–224.

[13] W.M. Orłowski, *Komercjalizacja badań naukowych w Polsce. Bariery i możliwości ich przełamania*, PWC, Warszawa 2013, p. 4–5.

3. TECHNOLOGY SCOUTING AS A RESPONSE TO THE PROBLEM OFTHE WEAKNESSES OF COMMERCIALISATION SYSTEM

The literature refers to technology scouting as a systematic approach that focuses on gathering information in the field of science and technology and facilitates or executes the sourcing of inventions and research results[14]. Technology scouting is either directed, i.e. searching in specific technological fields[15] or undirected, i.e. searching for new technological opportunities in white spaces not yet covered in the technological scope of the organisation[16].

The technology scout can be either an employee of the organisation or an external consultant, assigned part-time or full-time to the scouting task. The desired characteristics of a technology scout are similar to the characteristics associated with the technological gatekeeper. These characteristics include being a lateral thinker, knowledgeable in science and technology, respected inside the company, cross-disciplinary orientated, and imaginative[17].

In order to extract high-growth potential solutions from universities, scouting activities and screening of new knowledge can be done within the research labs and university departments. The role of a scout is twofold and refers to the directed and undirected scouting processes. In the first case, the scout would focus on investigating commercialisation possibilities for inventions and research results created by academic staff, whereas the second approach would concentrate on promoting services of solving business technological problems (with academic infrastructure serving as business external R&D units for companies).

The information on inventions and research results is usually spread among individuals, research teams, departments, etc. Scouting activities might be useful in:

- Integration of the sources of information.
- Acquiring direct information about running research activities and their commercialisation potential about the entrepreneurial attitude of academics.

At the same time, scouting can serve as a measure to overcome the cultural distance that often separates researchers from industrial applications (academics and business talking different languages). A suitable way to break cultural barriers can be directly interviewing research group members. Entering into a close relationship with the most open-minded researchers and achieving positive commercialisation results can soon facilitate word-of-mouth effects, leading to a natural diffusion of the culture of commercialisation and entrepreneurship within the academic community.

Another relevant aspect to be considered is that the scouting process should be bi-directional. On the one hand it should allow collecting information from the research group members and their activities while, on the other, the scouts could promote universi-

[14] J. Bodelle, C. Jablon, *Science and Technology Scouting at Elf Aquitaine*, "Research Technology Management" 36/5 (1993), p. 24–28; M.S. Brenner, *Technology Intelligence and Technology Scouting*, "Competitive Intelligence Review" 7/3 (1996), p. 20–27; R. Rohrbeck, *Harnessing a Network of Experts for Competitive Advantage: Technology Scouting in the ICT Industry*, "R&D Management" 40/2 (2010), p. 169–180.

[15] M.F. Wolff, *Scouting for Technology*, "Research Technology Management" 35/2 (1992), p. 10–12.

[16] G. Reger, *Technology Foresight in Companies: From an Indicator to a Network and Process Perspective*, "Technology Analysis & Strategic Management" 13/4 (2001), p. 533–553.

[17] R. Rohrbeck, *op. cit*., p. 169–180.

ties' commercialisation policy by i.e. providing information on the incubation process and reporting success stories.

The implementation of the scouting process should focus on directly interviewing every single research group existing at the university. It has to be stated that due to various reasons (such as hermeticity, distrust, etc.) not all potential stakeholders are accessible. Therefore a good strategy would be to work with those research groups that would become interested in scouting activities in order to get capillary information about researches and competencies while strengthening the relations with the most relevant (interested) stakeholders. As regards to this interview activities, it should be considered that research groups are still markedly hierarchic and talking formerly with research group leaders can prevent from future potential issues when relating with other, possibly more entrepreneurial, members of the group.

Scouting allows identifying inventions and research results which can have different levels of business and innovative potential. In order to assess such potential and try to foresee which research results are more likely to become successful spin-offs a screening process is needed. The screening can be performed at two different levels. During the interviews, when an idea, invention or research result is identified an initial evaluation is done directly by the scout. At a second level, after the idea, invention or research result would enter a more structured business opportunity stage, an assessment process of mixed technical and business evaluation could begin. The screening would allow to identify different types of inventions and research results "baskets":

- Inventions and research results that are ready to be patented / commercialised and are suitable to create a new business. In this case, the commercialisation process should focus on establishing a spin-off.
- Inventions and research results that are ready to be patented / commercialised but that are not suitable to create a new business. They could be transferred to an existing company. In such case, the technology transfer authorities at the university could support the patenting and transfer processes.
- Inventions and research results that are not ready to become an innovative business at the moment. In the case, a further work on them is required.
- Inventions and research results with feasibility problems that could be technical, legal, ethical etc. Therefore commercialisation would not be possible without overcoming those problems.
- Inventions and research results with low growth potential for which the market is too small to have a business potential, but may be suitable to be commercialised on a market niche.
- Inventions and research results that are not innovative or are not knowledge based and therefore are not the target for commercialisation.

The described "baskets" can be modified and the following commercialisation process can be shaped according to the existing policies and support commercialisation system at the university.

4. QUICKLOOK METHODOLOGY SUPPORTING SCOUTING AND COMMERCIALISATION PROCESSES

The prerequisite for the described approach to operate efficiently and effectively is to select a suitable method to support scouting and further commercialisation process. Com-

mercialisation is defined as a process of introducing a new technology (product, production method), research project results, etc. into the market[18]. In more details it focuses on the multidimensional process of innovation, determination of technical and business feasibility, creation of intellectual assets, and development of a plan to enter and engage the market. Therefore the research project developer must identify the market needs that would allow to build a business model for the market entry.

In order to achieve that one may use "guts feeling" or past experiences. In such case, decisions regarding the invention or research results could be made quickly, but they might not be the right ones. Furthermore, decisions entirely based on past experiences have a tendency to duplicate previous errors. The decision-making processes are also completely tacit, without the possibility to test the ideas, inventions or research projects results against the internal or external environment. There is no opportunity to identify stakeholders and partners or test the necessity to improve the invention or research results according to the market and stakeholder response, in order to gain better market acceptance, once it is launched. The barriers to market entry are unknown or guesstimated.

The methodology described in the paper is called Quicklook and used for commercial potential evaluation of inventions, research results, technologies, products, etc. (Cornwell, 1998). It has also been tested in Polish practice of commercialisation and inventions research results transfer by the author and by University of Lodz Technology Transfer Centre employees. The use of the described methodology was made possible because of the know-how transfer from IC2 Institute of the University of Texas at Austin. Originally this methodology was used by the NASA Mid-Continent Technology Transfer Centre reviewing NASA technology developments and further developed for academic purposes by the University of Texas[19].

The main purpose of the Quicklook methodology is to screen a large number of inventions and research results or a large number of different market opportunities for them. The end result of the process is then a focus on inventions and research results (or markets) that has the greatest commercialisation potential.

The commercial potential evaluation should be considered as an ongoing process, in which inventions or research results are evaluated at different development phases i.e. idea, preliminary models, working prototype and even further (post market launch evaluation) as the environment for the inventions and research results is highly dynamic and market requirements might evolve over time (during the research and development process). Furthermore, commercial potential evaluation performed later in the process, can be used to define a business model, product launch strategy, determine appropriate manufacturing methods or define the value of the invention or research results based venture. These studies may, however, require a more in-depth insight and assessment, than Quicklook methodology provides.

Quicklook methodology is mostly based on feedback from the stakeholders an market. Information gathered from potential researching partners and / or potential licensees, potential customers / end users, as well as potential distributors / suppliers are critical for this process. By contacting the experts in the market the scout can base decisions and evaluation result on market feedback combined with organizational experience. Because outside

[18] V.K. Jolly, *op. cit.*, p. 16–54.

[19] B. Cornwell, *Quicklook Commercialization Assessments*, "Innovation: Management Policy and Practice" 1/1 (1998), p. 7–9.

companies are contacted in the research process, the Quicklook methodology offers the possibility to discover new research directions, identify partners, and recognize barriers to market entry with enough time ahead to effectively convert those barriers into opportunities.

Quicklook methodology can also be seen as the first effort in market validation, resulting in an early-stage report of commercial potential. The earlier the market is brought into the evaluation process, the more opportunity the inventions and research results will benefit from this knowledge through the ability to modify the product, service, or marketing message in order that the inventions and research results address the market needs properly. In other words, the Quicklook methodology allows scouts and indirectly researchers to observe the market and listen to the voice of the customers and end users.

One of the most significant values of a Quicklook methodology is the ability to identify the potential partners (individuals and organizations) for the commercialisation process or licensees. The Quicklook methodology involves contacting them during the assessment process. If the benefits of the invention or research results are significant for the market, these early contacts may turn into further partnerships in the commercialisation process.

Another major value of the Quicklook assessment is that early warning signals of potentially high-risk commercialisation factors are identified. For example, a Quicklook methodology result may show that it is unlikely that the market will accept a price for the product that covers its expected manufacturing costs. In this case, the costs would have to be lowered to gain market acceptance. The Quicklook report may indicate that the life cycle of the product in the market is very short. This finding may push development of the product in order to take advantage of the existing market opportunity.

The typical result of a Quicklook methodology is a written report, covering approx. 10-15 pages and focusing on the feedback from the market. The average time used for the report preparation varies between 20 and 40 hours. It does not provide perfect information about the commercial potential of the invention or research result, nevertheless it is usually sufficient to select the inventions and research results with the highest market potential decide about further steps connected with the commercialisation process.

The table 1 below presents the suggested sections and specific questions allowing to gather information and evaluate the commercial viability of the invention / research results.

Table 1. Elements of Quicklook methodology

Sections of Quicklook methodology	**Specific questions allowing to evaluate the commercial viability of the invention / research results**
Invention / Research Results Description	• What are the important attributes of the invention/research results in language that a non-expert understands? • How can it be described in 2–3 sentences? • Would this fit into an existing product/process/service, and/or could it be developed into a standalone product/process/service?
Potential Stakeholders / Customers / End Users	• Who are the potential stakeholders / customers / end users? • How to reach them? • What kind of support will be required from them?
Potential Benefits	• What are the benefits of the invention/research results. for each group of the stakeholders / customers / end users? • How could the benefits be measured? • What are the problems that the invention/research results can solve? • Are there any additional (e.g. indirect) benefits?

Sections of Quicklook methodology	Specific questions allowing to evaluate the commercial viability of the invention / research results
Potential Commercial Markets	• Which markets would be interested in it? • What products/processes could result from the invention/research results implementation? • Which industries could it be used in? • What is the current and future state of the industries that constitute the market for the invention/research results? • What are the key benefits that the buyers in the market are looking for? • What is the potential market size and demand as a function of time?
Market Interest	• Do the potential markets show interest? • What feedback is given by potential buyers or end users?
Development Status	• Is the invention/research results finalized? • What is the development stage? • What is needed for finalization? • When will it be finalized? • Is there a prototype? • Can one be produced? • When will one be available? • To what extent has it been tested? • What are the cost considerations / assumptions for implementation? • What are the change requirements / reengineering considerations for implementation?
Intellectual Property (IP) Status	• Who owns the IP? • What protection does the IP currently have? • What are the main elements of the IP? • What types of IP protection have been explored / are planned?
Competing Solutions and Competitors	• What other inventions/research results are currently being developed that bring similar benefits / can be used to solve similar problems? • Who uses similar inventions/research results? • Do the invention/research results have a demonstrable and sustainable advantage over the competition on the market? • What are some of the competing organisations and do they dominate the market?
Barriers and Keys to Market Entry	• What are the barriers to market entry? • What are the keys to market entry?
Recommendations	• What is the decision regarding commercialisation opportunities? • Which basket (1 of 6) do the invention/research results belong to? • What are the next steps that need to be taken in order to commercialise the inventions/research results?
Contact Appendix	• List of the contacts that were used in the report • Summary if the conversations or dialogs with the contacts

Source: Own elaboration, based on: B. Cornwell, *Quicklook Commercialization Assessments*, "Innovation: Management Policy and Practice" 1/1 (1998), p. 7–9; T.B. Kalinowski, *Narzędziowe wsparcie procesu scoutingu – ocena wyników prac B+R z wykorzystaniem metodyki Quicklook oraz jej wpływ na procesy komercjalizacji*, [in:] *Budowa potencjału uczelni wyższej do współpracy z przedsiębiorstwami. Rola scoutingu wiedzy*, red. P. Głodek, M. Wiśniewska, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2015, p. 67–77.

The presented sections and questions can be modified and extended with any required topics or points of view. However in order to provide the consistency of the process and facilitate the assessment comparisons between different inventions and research results, it should be considered to use a standard set of Quicklook methodology characteristics for all evaluations performed within university.

5. USABILITY EVALUATION AND AREAS OF APPLICATION OF THE QUICKLOOK METHODOLOGY – RESEARCH RESULTS

In order to support scouting and further commercialisation processes, the Quicklook methodology has to be accepted not only by its main users (scouts) but also it has to be reliable from the researchers' point of view, who would act and provide information according to the given standard. With the intention to examine the usability of Quicklook methodology in Polish universities, the author performed research on the sample of higher education institution (HEI) representatives. The questionnaire was prepared with the application of an internet survey tool (webankieta.pl) and distributed among 96 HEI representatives. All respondents were recruited from different types of courses (master and postgraduate studies) and trainings conducted by the author. The completed surveys were returned by 78 respondents. The sample included different types of HEIs – universities (38 respondents), medical universities (26 respondents); technical universities 14 respondents. The opinions were gathered mainly from assistant and associate professors (50 respondents), but also PhD candidates (4 respondents) and master degree students (24 respondents). Over half of the answers (52,6%) have been gathered from researchers with extensive (over 5 years) professional and research experience.

The first part of the survey focused on determining the usability of the Quicklook methodology. For this reason a set of statements have been assessed by respondents using a 7 point Likert scale. The scale have been defined as following, varying from "1 – NO, I completely disagree with the given statement" to "7 – YES, I totally agree with the given statement".

The table 2 below presents the statement referring to the Quicklook (QL) methodology and shares of the given answers.

Table 2. Usability assessment of Quicklook methodology, based on own research

Statement	Average evaluation
QL methodology facilitates the evaluation of the economic potential of inventions / research results.	6.0
QL methodology guidelines are sufficient to evaluate the economic potential of inventions / research results.	5.3
QL methodology is useful for the preparation of the description / presentation of the inventions / research results in the scientific environment.	6.0
QL methodology is tailored to the needs of researchers in the evaluation of the economic potential of inventions / research results.	5.2
QL methodology is too simple to use it for evaluation / presenting complex inventions / research results.	1.4
QL methodology is useful for presenting the inventions / research results in scientific publications.	3.7

Statement	Average evaluation
QL methodology is useful for presenting the inventions / research results in the process of applying for research grants such as NSC (NCN), NCRD (NCBiR), FP7, ERC, etc.	4.9
QL methodology is useful for presenting the inventions / research results in a business environment.	5.9
QL methodology can guide the actions of the inventions / research results authors and can influence the related research work.	5.5
QL methodology facilitates the research and / or development of inventions / research results and increases the probability of achieving the planned research objectives.	5.7

Source: Own research.

In general the respondents agreed with most of the statements describing the usability of the Quicklook methodology (first 4 and last 3 statements, for which the average evaluation was over 5.0). The largest dispersion of results could be observed with the assessment of the following statements:

- QL methodology is too simple to use it for evaluation / presenting complex inventions / research results.
- QL methodology is useful for presenting the inventions / research results in scientific publications.
- QL methodology is useful for presenting the inventions / research results in the process of applying for research grants such as NSC (NCN), NCRD (NCBiR), FP7, ERC, etc.

These three statements can be considered as related with each other. Regarding the first two cases, the explanation could be that, the Quicklook methodology was designed and was meant to be simple in use. Similarly the output of the Quicklook methodology (e.g. report, recommendation, etc.) should also be simple in terms of i.e. the language used. Those factors may result in an opinion that this kind of output might not be suitable for the description of complex scientific projects. This situation can also be confirmed by author's observation on the approach to describe inventions and research results for different purposes (research grants, application forms for commercial assessment purposes, etc.) where very often a difficult to understand, scientific language is used that results in problems with understanding the benefits and core elements of the presented inventions and research results. It should be noted that this is one of the reasons for misunderstandings during contacts between academics and business representatives. The third of the mentioned statements (QL methodology is useful for presenting the inventions / research results in the process of applying for research grants such as NSC (NCN), NCRD (NCBiR), FP7, ERC, etc.) was one of the two with the largest share of neutral indications. Although most of the respondents (27) agreed with the statement, it should be noted that the described methodology should play a supportive (not main) role in using its elements for description of scientific projects grants.

The second part of the survey concentrated on identifying benefits of the Quicklook methodology - the respondents were asked to indicate up to 3 most useful characteristics of the tool. The results are presented in the table 3 below.

Table 3. Most useful characteristics of the Quicklook methodology

Most useful characteristics of the Quicklook methodology	n	%
Identification of opportunities and threats at an early stage of the research project.	40	51.28 %
Recognition of real (not potential) benefits of inventions / research results.	36	46.15 %
"Snapshot" look - a synthetic form of the description of inventions / research results.	32	41.03 %
Emphasis on description of inventions / research results in plain, unscientific / non-technical language.	24	30.77 %
Identification of various possible applications for inventions / research results.	24	30.77 %
Ability to evaluate the market potential of inventions / research results at different stages of development process.	20	25.64 %
Emphasis on primary sources and research (interviews and identification / verification of market needs).	14	17.95 %
Identification of potential partners / licensees.	14	17.95 %
A method to select the best projects (better use of available resources).	12	15.38 %
Other.	4	5.13 %
The Quicklook methodology is not useful.	0	0.00 %

Source: Own research.

The most frequently indicated characteristics of the Quicklook methodology (over 40% of responses) were:

- Identification of opportunities and threats at an early stage of the research project (during discussions among the respondents this characteristic was also presented and seen as a part of SWOT analysis).
- Recognition of real (not potential) benefits of inventions and research results.
- "Snapshot" look - a synthetic form of the description of inventions and research results.

It is worth noting that none of the respondents perceived the Quicklook methodology as being not useful at all. Furthermore, in this part of the survey the respondents were asked if any important characteristic is missing from the Quicklook methodology. 94,87% of respondents (n = 74) stated that cannot identify any missing element. However four of the respondents (5,13%) highlighted the need to incorporate financial planning and regional development issues in this kind of tools.

It can be concluded that the Quicklook methodology has been accepted as a method to assess inventions and research results by university's representatives in the research sample used. It has been both reflected through overall high assessment of the methodology usability and identifying its benefits. Nevertheless, it should be noted that the research sample is limited in size and in order to achieve full assessment of the described methodology, research on a larger sample should be performed.

6. CONCLUSIONS

The article focused on three dimensions of commercialisation related issues. Firstly, it addressed the weaknesses of the current system that can be observed within universities. Secondly, it demonstrated an example of using a technology scouting approach to over-

come some of the identified obstacles. Finally it described the methodology with empirically confirmed usability to support the approach.

The key advantage of the described system is its active character. Scouts can be described as "antennas"[20] for gathering valuable information from academic staff, continually participate in research processes and evaluate the market potential of the achieved results. Furthermore identification of potentially successful commercialisation opportunities can facilitate the process of initiating the cooperation between academia and business, as well as provide support from the university commercialisation authorities, responsible for invention or research results valuation, patenting, etc.

The first attempt to introduce technology scouting in a Polish university was a project "Scouting – active system of monitoring and evaluation of market potential of research results as a key to cooperation between science and business" (www.scouting.uni.lodz.pl), with the author taking part in it. The project was implemented by Faculty of Management and Technology Transfer Centre at the University of Lodz, in collaboration with the University of Cadiz (Spain) and the University of Turin (Italy), under the funding of Human Capital Operational Programme.

The described Quicklook methodology is not only a tool for scouts to be used for screening and evaluation of inventions and research results, but can also serve as a set of requirements to assess the market potential of any planned or current research project within university. Nevertheless, the knowledge about the actual use of market criteria as a decisive factor in initiating a research project in Polish universities is not known and could be considered as a future research area.

In conclusion the main aim of the presented approach is to improve the cooperation of universities with business practice as well as development of commercialisation systems. Although still a great amount of organic work is needed to improve the current situation, the described system could in the long term lead to:

- Establishing active (aimed at identification and monitoring of knowledge creation at different levels of university), instead of passive (based on reports from the academic staff) approach to commercialisation.
- Integration of identification and monitoring systems in order to avoid large dispersion of information about inventions and research results (as the sources of knowledge are varied and may be in individuals, research teams, departments, etc.).
- Higher degree of openness of the scientific environment for collaboration and knowledge sharing with business practice and furthermore building capacity for academic entrepreneurship and developing academic staff experience in commercialisation.
- Building awareness of universities administrative and management staff supporting the process of establishing effective commercialisation systems promoting practical applications of inventions and research results instead of focusing mainly on publishing.

[20] I. Kowalczyk, J. Pawłowska, F. Sarti, B.I. Zago, *Metody inkubacji projektów biznesowych*, Polska Agencja Rozwoju Przedsiębiorczości: Warszawa 2011, p. 12–18.

REFERENCES

[1] Audretsch D., Aldridge T., *Scientist commercialization as conduit of knowledge spillovers*, "Annals Of Regional Science" 43/4 (2009), p. 897–905.

[2] Bodelle J., Jablon C., *Science and Technology Scouting at Elf Aquitaine*, "Research Technology Management" 36/5 (1993), p. 24–28.

[3] Brenner M.S., *Technology Intelligence and Technology Scouting*, "Competitive Intelligence Review" 7/3 (1996), p. 20–27.

[4] Chiesa V., Piccaluga A., *Exploitation and Diffusion of Public Research: The Case of Academic Spin-off Companies in Italy*, "R&D Management" 30/4 (2000), p. 329–339.

[5] Clark B.R., *Creating Entrepreneurial Universities, Organizational Pathways of Transformation*, Emerald, Bingley 2008.

[6] Cornwell B., *Quicklook Commercialization Assessments*, "Innovation: Management Policy and Practice" 1/1 (1998), p. 7–9.

[7] Etzkowitz H., *The Norms of Entrepreneurial Science: Cognitive Effects of the New University-Industry Linkages*, "Research Policy" 27/8 (1998), p. 823–833.

[8] Jolly V.K., *Commercializing New Technologies: Getting from Mind to Market*, Harvard Business School Press, Boston 1997.

[9] Kalinowski T.B., *Narzędziowe wsparcie procesu scoutingu – ocena wyników prac B+R z wykorzystaniem metodyki Quicklook oraz jej wpływ na procesy komercjalizacji*, [in:] *Budowa potencjału uczelni wyższej do współpracy z przedsiębiorstwami. Rola scoutingu wiedzy*, red. P. Głodek, M. Wiśniewska, Wydawnictwo Uniwersytetu Łódzkiego, Łódź 2015, p. 67–77.

[10] Kowalczyk I., Pawłowska J., Sarti F., Zago B.I., *Metody inkubacji projektów biznesowych*, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2011.

[11] Matusiak K.B., Guliński J., *System transferu technologii i komercjalizacji wiedzy w Polsce – siły motoryczne i bariery*, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2010.

[12] Orłowski W.M., *Komercjalizacja badań naukowych w Polsce. Bariery i możliwości ich przełamania*, PWC, Warszawa 2013.

[13] Reger G., *Technology Foresight in Companies: From an Indicator to a Network and Process Perspective*, "Technology Analysis & Strategic Management" 13/4 (2001), p. 533–553.

[14] Rohrbeck R., *Harnessing a Network of Experts for Competitive Advantage: Technology Scouting in the ICT Industry*, "R&D Management" 40/2 (2010), p. 169–180.

[15] Schane S., *Academic Entrepreneurship. University Spinoffs and Wealth Creation*, Edward Elgar, Cheltenham–Northampton 2004.

[16] Siegel D.S., Waldman D., Link A., *Assessing the Impact of Organizational Practices on the Relative Productivity of University Technology Transfer Offices: an Exploratory Study*, "Research Policy" 32/1 (2003), p. 27–48.

[17] Stawasz E., *Rozwój badań nad innowacyjnością małych i średnich przedsiębiorstw w Polsce*, "Folia Economica" 2010/234, p. 125–136.

[18] Wiśniewska M., Głodek P., Żak-Skwierczyńska M., *Scouting – system identyfikacji i monitoringu wiedzy w uczelni wyższej, jako instrument na rzecz wzmocnienia powiązań nauki i biznesu*, "Folia Oeconomica" 2012/276, p. 35–52.

[19] Wolff M.F., *Scouting for Technology*, "Research Technology Management" 35/2 (1992), p. 10–12.

[20] Zehner B.W., Trzmielak D., Gwarda-Gruszczyńska E., *Value Creation via Technology Commercialisation International Education Programs American and Polish Perspectives Based on Experience*, University of Bratislava, Bratislava 2011.

[21] Zienkowski L., *Gospodarka oparta na wiedzy – mit czy rzeczywistość*, [w:] *Wiedza a wzrost gospodarczy*, Wydawnictwo Naukowe Scholar, red. L. Zienkowski, Warszawa 2003, p. 13–32.

ZWIĘKSZANIE POTENCJAŁU KOMERCJALIZACJI INNOWACJI I WYNIKÓW BADAŃ W POLSKICH UCZELNIACH

W artykule zaproponowano podejście mające na celu poprawę potencjału komercjalizacji polskich uczelni. Komercjalizacja na potrzeby artykułu definiowana jest jako całokształt działań związanych z przenoszeniem danej wiedzy technicznej lub organizacyjnej i związanego z nią *know-how* do praktyki gospodarczej – to proces zasilania rynku nowymi technologiami. Artykuł skupia się na trzech aspektach procesów komercjalizacji. Po pierwsze, odnosi się do słabości obecnego systemu, które można zaobserwować w ramach wyższych uczelni. Po drugie, pokazuje przykład wykorzystania scoutingu technologicznego jako podejścia do pokonania niektórych ze zidentyfikowanych przeszkód. Wreszcie po trzecie, opisuje metodykę wspierającą scouting i procesy komercjalizacji z empirycznie potwierdzoną użytecznością. Ustanowienie aktywnego (dążącego do identyfikacji i monitorowania kreowania wiedzy na różnych poziomach jednostki naukowej) zamiast biernego (na podstawie informacji przekazywanych przez kadrę akademicką) podejścia do komercjalizacji innowacji i wyników prac badawczo-rozwojowych może być kluczem do poprawy efektywności w tym zakresie. Wymagane cechy opisywanego podejścia to m.in.: otwartość środowiska naukowego na współpracę i dzielenie się wiedzą z praktyką gospodarczą, zdolność do budowania przedsiębiorczości akademickiej oraz rozwój kompetencji pracowników naukowych w obszarze komercjalizacji. Zaproponowane w artykule podejście może być przydatne do projektowania procesów komercjalizacji w jednostkach naukowych. Publikacja jest nowatorska pod względem analizy doświadczeń związanych ze stosowaniem scoutingu w warunkach akademickich i empirycznej walidacji narzędzia wspierającego scouting i procesy komercjalizacji.

Słowa kluczowe: komercjalizacja, transfer technologii, innowacja, scouting, metodyka Quicklook

DOI: 10.7862/rz.2016.mmr.16

Tekst złożono w redakcji: sierpień 2016
Przyjęto do druku: wrzesień 2016