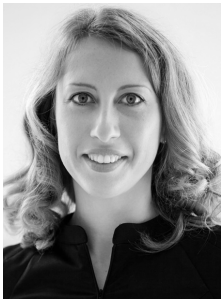
Exploring forms of academic engagement for MNEs in the Russian IT industry (Part I. Academic engagement and multinational enterprises)



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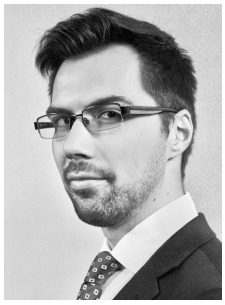

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In this article, the benefits and forms of university–industry cooperation are analyzed, and the role of academic engagement for MNEs is discussed in relation to the decision to internationalize R&D in host countries. Different forms of academic engagement are reviewed on the examples from the Russian IT industry, and a classification of cooperation models is proposed, which aims at explicating and simplifying managerial decision-making with regard to choosing an appropriate form of university–industry cooperation

The paper uses both secondary and primary sources of information. For the first part of the study, in-depth interviews were conducted among managers of academic engagement programs between MNEs operating in the IT industry and Russian universities. Secondary data is used to sort existing practices according to the proposed categorization of university–industry forms of cooperation. Finally, the case of Dell EMC academic engagement in Russia is described to support the proposed categorization and depict directions of future studies.

As a result, the benefits of academic engagement were aligned with the challenges, which MNEs face as they design their R&D strategies and consider between localization and internationalization. A categorization of university–industry cooperation models has been established as forms of such partnerships were distinguished and described. The research is exploring important challenges for MNEs in a very specific and understudied aspect of university–industry cooperation. The results of the paper may be used both by other researchers and practitioners, who are interested in the Russian market, or are choosing among different forms of collaboration with universities.

Keywords: university–industry cooperation, MNEs, academic engagement, R and D strategies

Introduction

The literature stream on university–industry cooperation appears to be concentrated on studying of how this type of partnerships impacts universities, companies or the economic sphere, providing evidence that engaging in such relationships can be beneficial to all sides [1-3]. For the last decade, the focus of researchers has been shifting from using registered patents, licensing and scientific publications as an efficiency indicator of such practices to looking at indirect measures, such as knowledge exchange, social capital increase, and the formation of innovation systems [4, 5]. This is partially due to the fact that only a relatively small portion of

university–industry cooperation actually results in the commercialization of academic knowledge [6, 7]. In many cases it is pursued for the sake of academic engagement, i.e., without the objective to reap direct financial rewards [8]. Empirical studies of academic engagement present greater methodological difficulties, are often contingent upon the area, where the university is located [5], and yet can be seen as more reflective of the phenomenon at large.

Because the interaction between university and industry is recognized to increase the rate of innovation in the economy [9, 10], many governments are now working to stimulate such practices [3]. However most existing studies focus on the United States or such European countries as the UK, Spain, Germany or Sweden, while largely ignoring non-Western countries [11]. It is believed that in comparison to U.S. American counterparts, many European and Asian firms fail to commercialize new knowledge generated in universities [12, 13]. Knowledge transfer collaborations in emerging markets have additional challenges such as low market stability, specificity of local education, capabilities and cultural value systems [14, 15]. By surveying the literature on university–industry cooperation, it is possible to notice an interest in testing the barriers and drivers of such practices in emerging markets [14, 16, 17], but the number of such research is relatively small, especially with regard to studies of the Russian Federation.

There exists research, where multinational enterprises (MNEs) are used as part of data sets analyzed to find insights about university–industry cooperation [18, 19], and also studies, which highlight that collaboration with universities is important to MNEs [3, 20, 21]. However, the two streams of literature rarely meet together. This should be surprising mainly because it already has been shown that possibilities for academic engagement play one of the major roles in the decision for MNEs to internationalize R&D and choose a country to locate, especially for developing economies [20]. As we suggest that this topic requires more attention, than it has been receiving from researchers, we believe that the proposed research question must no longer be about whether or not the MNE should engage in such cooperation, but rather how it should do so. While the general economic benefits of university–industry collaboration are well documented in the literature, academic engagement activities are still not institutionalized in many universities around the world, which means that there is little formal record of the nature of those activities and the variety of forms which they take [5]. This makes it very difficult for those MNEs, which already have decided to pursue academic engagement, to make the choice of an appropriate form of collaboration.

Therefore, we proceed to explore the influence of academic engagement on MNEs. The goal of this paper is to explore the forms of university–MNE cooperation to propose categorizations, which would contribute to explicating and simplifying managerial decision-making with regard to designing an appropriate form of academic engagement. To do that, first we describe the value creating mechanisms of university–MNE cooperation by synthesizing the two research streams together: the literature pertaining to R&D internationalization strategies of multinationals and research of university–industry cooperation. Afterwards, we analyze alternative forms of university–industry cooperation based on data from collaboration practices in the Russian IT industry. The results are then supplemented by an illustration of the case of academic engagement by Dell EMC — one of the top suppliers of IT-solutions, big data and cloud computing technologies in Russia and the world.

Academic engagement and multinational enterprises

Rapid technological progress and globalization continue to accelerate international exchange of high technologies by expanding cooperation and investment ties in the field of scientific R&D and manufacturing of hi-tech products. Multinationals constitute an important driving force in these processes [22] as they aid in modernizing industries and economies by developing technologies, sharing knowledge, supporting competition, and making available a wider range of better quality products through engaging in ongoing innovation activities on different organizational levels [23]. In return, innovation development is considered to be a crucial driver for MNEs' contemporary growth and leads to the creation of various benefits and ultimately — the competitive advantage of the MNE on the markets, where it operates [24].

Originally, researchers believed that innovation production is a prerogative of the MNE's home country, assuming that the research centers at the headquarters have more impact on innovation development. However, today it becomes evident that the expanding subsidiaries present high potential for innovation development, thanks to the access to tacit and explicit knowledge of the local market [25, 26], which is gained through establishing professional networks with local communities, such as universities and research institutions [27]. The need for new mechanisms of integration of science and business becomes even more important in the time of economic crises and companies' budget deficit, when it is challenging to invest in internal R&D. Another reason for the internalization of R&D is connected to the rapid development of the scientific and innovation infrastructure of higher education institutions in such countries as China, India, and Russia: on the bases of local universities strong international scientific laboratories are created, which find high interest for collaboration from various MNEs [28].

The practices of collaboration by academic researchers with non-academic organizations, such as MNEs, are often referred to as «academic engagement», and are viewed as practices related to knowledge transfer [8]. These interactions encompass such activities as collaborative research, contract research, consulting, providing ad hoc advice, and networking with practitioners. According to Perkmann et al. (2013) [8] in such collaborations the academic may work for a fee, or receive non-financial benefits such as access to materials or data for research projects. However the goals pursued by the partners usually go beyond conducting a research for the sake of academic publishing, and should seek to generate a utility for the non-academic partners as well (e. g., new ideas on application-oriented issues or problem solution) [3, 8].

Although research of academic engagement tends to focus rather on small and medium enterprises [29-31]; it has been established that those are the larger firms that actually have a higher probability of benefiting from academic research [29, 32] as they tend to rate universities higher than smaller firms as sources of information and knowledge [33], and they have larger R&D resources that allow them to access external sources of expertise [18].

MNEs in particular represent a new context for studying the drivers of academic engagement as the potential benefits of collaboration with universities in the MNE host countries represent a major factor in the decision to internationalize R&D. It has been found that the decision to cooperate with universities is tightly connected to the overall innovation strategy of the MNE [29]. Moreover, Thursby and Thursby (2006) [20] show that regardless of where companies consider to locate R&D, university collaboration stands out as one of the most important choice factors, along with output market potential, quality of R&D personnel, and intellectual property protection. They note that university factors are as important as costs in developing economies and more important in developed economies. However, the role of universities and university faculty in the selection of sites is often overlooked in much of the public discourse on R&D site selection and offshoring.

Lately, it has been possible to see a noticeable growth in interest in academic engagement with Russian universities from the side of the many international corporate players in the IT market: Dell EMC, Motorola, LG, Microsoft and others. For instance, in 2011 such notable MNEs as JetBrains, Yandex and EMC together with HP Labs opened a research center for computer science, where students are encouraged to join in working on real research projects for the companies. The Polytechnical University of Peter the Great created joint centers with Motorola (1995), LG (2004), SAP (2005), Electrolux (2007), National Instruments (2010), EMC Corporation (2013), and Autodesk (2014) [34]. In 2013, Cisco Academy was opened together with Moscow State University of Management, where both the university students and invited staff of Russian Ministries could attend special educational programs. In 2014, Microsoft Research signed an agreement with Lomonsov Moscow State University for creating a series of research projects on visualizing big data. Another example of academic engagement is the IT cluster created by the Moscow Institute of Physics and Technology in 2013, which united Parallels, ABBYY, 1C, Acronis and Competentum in designing educational programs in computer science and software engineering.

We find that the trend is illustrating that the intensification of academic engagement corresponds to the general needs of MNEs in the Industry of IT, and, in particular — their R&D strategy. Also we came to the conclusion about the uniqueness of the industry-academia collaboration experience in IT-sphere as in the global economy there are a few industries that have developed in recent years as dynamically as the information technology industry. This explains the fact that IT-companies are more active than other enterprises and they seek a mutually beneficial collaboration with universities, especially in terms of training specialists with concrete theoretical and practical base and university IT-startup investment possibilities. It is close cooperation with universities that allows access to the most advanced technologies and developments. For example, a corporate master program (some universities still retain the notion of «core departments») allows the company's specialists to participate in the writing of educational programs, including relevant sections of knowledge, track talented personnel, delegate a number of complex tasks facing companies to university specialists (or solve them together). In addition the equipment of the joint company–university R&D center does not require huge investments (the delivery of laptops is incommensurable with the delivery of expensive equipment in medicine, optics, etc.).

We believe that investigating the benefits of academic engagement and comparing the forms of such collaboration in the Russian IT industry will provide greater insight into multinational enterprises involvement in university–industry collaborations. Moreover, the research may be viewed as a contribution to the scientific discussion of the localization-internationalization dilemma of MNEs as we bring the insights from the academic engagement literature to the discourse.

Benefits of academic engagement for mnes

To explain how academic engagement can help the MNE to achieve its goals, we start the analysis from reviewing the challenges, which MNEs face with the choice to locate R&D outside the home country. We then proceed to describing and categorizing the potential benefits brought by academic engagement to the MNE in order to solve those challenges. Consistent with this, we aim to bridge the two streams of literature together and illustrate how collaboration with universities can influence R&D site selection for MNEs.

The literature review presented in Table I allowed to categorize the main challenges of MNEs related to R&D internationalization into 4 distinctive categories: (1) skills shortage and growing demand for capable employees, (2) the need for localized market knowledge, (3) creation of new knowledge and facilitation of innovation, and (4) the need to be embedded in informal networks (see table 1).

This categorization is consistent with the European Commission report (2011) [47] and the classification scheme proposed by Gassmann and Han (2004) [48], who examined the specific motivations for R&D internationalization in the Chinese context and categorized them to either input-oriented motivations (availability of highly qualified personnel, tapping informal networks and knowledge sources, and local pockets-of-innovation), performance-oriented motivations (customer and market-specific development, adaptation to local production processes, and cost advantages), and business-ecological motivations (government policy, continuing economic growth and unique market size, peer pressure). The major difference of the proposed classification is that we exclude from the scope of this study such economic and political motivations as seeking cost advantages, and all business-ecological motivations, due to reasons stated in the research limitation section of the paper.

Table 1

Challenges of MNEs related to R&D internationalization

Challenge	Challenge description
Skills shortage and growing demand for capable employees	Human resource management and talent acquisition present an important challenge to MNEs. The shortage of high skilled talent and capacity bottlenecks partially explain decisions of R&D relocation [19], as the host country choice is largely determined by its current scientific and engineering capabilities [35]. When the capabilities of the workforce available in the host country are not sufficient enough, and hiring employees from home country nationalities is not possible due to language barriers and vast cross-cultural differences, MNEs have to invest in developing the human resource in host country markets to fit their needs [36, 37]
Need for localized market knowledge	Firms from industries, which have strong linkages to basic science (e. g., biotechnology, pharmaceuticals, etc.) or are closely connected to suppliers and customers through international production networks (e.g., automotive, electronics, etc.) find it useful to locate R&D in host countries, close to excellent research universities and develop capabilities in proximity to key clients [38] The more tacit and bound to individuals is the required knowledge base, the more costly is the knowledge exchange over distance and hence the stronger are the incentives to move to the place, where this knowledge is available [39]. Local variations of taste, infrastructure and economic wealth make it necessary for the MNE to align new products with the often unknown expectations of new customers in the host countries [40]. Studies show that establishing R&D centers in the host country positively affects the ability of MNEs to adopt their products to the needs of the foreign market [41, 42] by obtaining current market knowledge and technology intelligence on competition that helps commercializing R&D efficiency in the foreign market
Creation of new knowledge and facilitation of innovation	The availability of skilled researchers and the existence of measures that stimulate the creation, diffusion and utilization of new knowledge and technologies are among the most important location criteria for R&D to those MNEs, which are open to new ideas and solutions [14]. Many companies actively seek fresh and unbiased external perspectives to help solve current problems and improve processes inside the MNE [43]. Such collaboration gives the ability to leverage an open innovation strategy, thus enhancing the capacity of business organization to solve specific and complex problems [44]
Need to be embedded in informal networks	Institutional and cultural barriers in the host countries may lead to a low degree of embeddedness in the local informal networks, also known as "liability of foreignness" [45]. Building networks and public relations in a new geographic region is an enormous challenge, both in effectively localizing the message and in the capital expenditures necessary to create a momentum. Achieving stable relationships with reputable firms, institutions, and opinion leaders can improve the firm's legitimacy in the eyes of local stakeholders [36] and be a major source of competitive advantages, especially in emerging markets [46]

Source: Authors' elaboration

In order to illustrate how academic engagement may help the MNE to overcome the above described challenges, we synthesize the possible benefits, which may come from such cooperation, as they are described in the literature pertaining to the research topic. In existing studies these benefits are often called «drivers» [16] or «channels of influence» [3, 49], and can be classified in many different ways. Some authors classify them according to how they affect financial output of the collaboration to either direct (e. g., patents, licenses) or indirect (e.g., knowledge sharing) [49]. Other researchers divide them into relationship drivers or business drivers [16, 49]. However, guided by the purpose of the analysis, we follow the classification of benefits by their providers, i.e. the actors in the knowledge exchange processes [50, 51]. Table 2 illustrates the summary of benefits resulting from academic engagement, which were synthesized from existing literature on the research topic [51-54] as they are categorized to either academics- university, or student-related benefits.

Putting the benefits of academic engagement against the challenges of R&D internationalization for MNEs it is possible to conclude that university–industry cooperation practices aid the MNE is a many number of ways.

First, it must be understood that the skills shortage problem faced by MNE is from the one hand — a short-term problem of availability of qualified R&D personnel in the host country that seriously affects the decision of a country to locate in [19, 20], but, from the other hand — is also a long-term challenge related to the constant need to find and educate new talent [27]. By collaborating with universities, it is possible to insure a sufficient and qualified human resource base without the necessity to approach the open job market, but by engaging in joint projects and using the academics' network of relations [55] to increase the quality and the quantity of the HR pool. Then, by engaging in apprenticeship projects and offering internships to students, it is possible to secure efficient recruitment process for the company in the long-run [51].

Also, the MNEs' need for localized market knowledge and help in the facilitation of innovative ideas can be largely solved by engaging in joint research with academics [49]. The licensing of university patents and the opportunities of using the already existing specialized university facilities allow to quickly gain access to new ideas and technologies [3, 56], and increase the speed and quality of R&D [52]. Finally, by using the university networks of contacts and relationships with local scientific and professional communities, educating the market about the company through the students, and receiving the good publicity that might result from the collaboration, it is possible to effectively get embedded with various informal networks [36, 57] compensating for the liability of foreignness problem of MNEs.

Criteria for academic engagement categorization

The current literature on academic engagement is focused on the analysis of the interconnections between various university–industry joint activities and the performance of one or both of the parties based on using survey methods and case studies. The results of these studies are particularly useful, when the question is

Table 2

Benefits of academic engagement by provider

Actor	Receive	Give in return
Cooperation with academics	Favorable performance evaluation according to the extent of contributions to the university–industry collaboration process; funding for research; help in changing or updating methods of learning and teaching; enhancing researchers' practical knowledge, taking new knowledge to practical application, basing research on real time industrial environment; sense of accomplishment when working with industry	Improving product quality by enhancing research and development progress through research collaboration; faculty consulting, mentoring, workshops, and trainings; recruitment possibilities, personnel movements from university to the firm; joint creation of new patents; access the scientific communities and useful networks of specialists; joint authorship with university scientists
Cooperation with students	Undergraduate training, final year projects, courses with sufficient practical experience, adaptation to practical-based teaching; the chance to understand current challenges, career insights, and job training in industry, acknowledgement of expectations; vacation employment and placements, industrial visits, internship programs, small research training	Possibility of hiring top graduate students before they enter the job market and get known by competitors; increased level of qualification for future recruits, apprentice training from an early stage; knowledge exchange as result of guest seminars, recruitment events, and student research projects; promotion of the firm positioning in the market and as a HR brand
Cooperation with the university	Enhancement of job offers for graduates, which fosters the university brand name in the education marketplace; financial support for university research, sharing government funding on research projects, payments for contract research, royalty payments for patents; knowledge development about practical problems useful for curriculum enhancement, and keeping the program relevant to industry requirements; understanding the future needs of society regarding new products, processes, and services, examining the practical application of current research for future needs	Renewal and redirection of education for the industry, supporting the growth of the industry; outward orientation, blue-sky research, fundamental research with open research ideas, stimulation of new projects, new products and processes; licensing of university patents, access to highly specialized university facilities, access to new ideas and technologies; good publicity for maintaining an ongoing relationship with the university and social responsibility practices

Source: authors' elaboration

whether a company or a university needs to engage in such cooperation, but once the positive decision is made, it remains unclear how to institutionalize the collaboration [49, 50].

Hence, in this part of the work, we aim to support the analysis of academic engagement drivers of MNEs by introducing a framework, which would illustrate the options companies would have once the decision to pursue a partnership with universities in the host country is made. To do that, we first classify various forms of academic engagement prevalent in the Russian IT industry based on secondary sources — openly available descriptions of the work and structure of existing MNE–university collaborations. Then, we compare forms of academic engagement by grouping them in to suggested models of cooperation.

Before proceeding with the analysis, it is important to mention the distinction between academic engagement and commercialization of academic knowledge, which are two interconnected types of university–industry collaboration. University–industry collaboration assumes any form of interaction between higher-educational institutions and MNEs that aims to encourage knowledge and technology exchange [36, 58] and enhance innovation through creating platforms for continuous exchange of information [44]. Commercialization involves patenting and licensing of inventions and academic entrepreneurship [59], and unlike academic engagement, commercialization assumes that an academic invention is exploited with the objective to reap financial rewards. Early studies of university–industry relationships focused on commercialization of science, while the last decade's studies have rather focused on academic engagement [5, 8, 60]. Although commercialization has attracted major attention both within the academic literature and the policy community [61, 62], research shows that university–industry collaboration is hardly translated into new products or services [6, 7]. Hence, further on we will focus solely on academic engagement practices.

In order to choose the criteria for classifying academic engagement forms, we conducted a literature review of scientific work on the subject. We found that researchers pertain to classify academic engagement forms based on different bases. For instance, Kneller et al. (2014) [63] characterize such partnerships from the perspectives of publication freedoms and intellectual property lock-up. Schubert and Bjorn-Andersen (2012) [64] use the number of participants on each side as classification bases, and Banal-Estanol et al. (2013) [65] — one-to-one versus two-sided aptitudes. Muscio and Pozalli (2012) [66] describe various models in relation to the degree of involvement of partners, the overall complexity of the collaboration process, and the dynamics of knowledge exchange flows. We concluded that the dispersed results are subject to various industry contexts and research objectives used in these studies.

To overcome this, we decided to conduct in-depth interviews with managers of academic engagement programs in the Russian IT market to understand how they distinguish between types of academic engagement, and then — to turn back to existing research to find theoretical justification for the suggested criteria. The qualitative method was chosen for this study because without full knowledge of the nature of the phenomenon investigated, it would have been practically impossible to draft appropriate measurable questions for a survey [67]. Under the author's guidance, the interviewees discussed open-ended questions concerning the variety of forms of cooperation, which exist as part of these programs, their comparison and differences from other known practices

of academic engagement of that company or university. Overall, 12 in-depth interviews were conducted with the managing specialists in charge of choosing and editing the form of each university–industry cooperation. The sample included 9 managers with an official affiliation to the university-partner, while the rest were company representatives actively engaged in coordinating the partnerships as part of their job responsibilities.

A content analysis of the interview records was then held by the research team members and resulted in the induction of two main categorization criteria: «location», which is understood as the proximity to the university/company, and «integration» — as the intensity of the relationship between the partners. In the literature, location is described as the spatial proximity to research facilities, universities, and industry specific agglomerations, and is considered to have a strong correlation with knowledge spillovers [12, 68]. The argued explanation for the regional localization of knowledge is usually the tacit nature of knowledge which requires direct, inter-personal contacts to be obtained [21, 69]. Integration has also been studied in the literature previously, and is often measured as the level of physical or communicative integration between the platform and the partners [63-65]. The concept of integration involves the information sharing and active involvement in the overall processes [70].

In the next section, an academic engagement categorization will be proposed based on the two criteria described above. In a different setting, instead of integration and location, there, in fact, could have been any other criteria; and they would also be usable for a different categorization proposition, as long as they are seen by the stakeholders of the studied university–industry cooperation as useful for differentiating among academic engagement forms. We believe that in a context of a general lack of firm-oriented studies, which could have provided instruments applicable for decision-making on the discussed topic, any proposition of a multidimensional categorization based on empirical evidence could be of real help to practitioners, who require guidance and transparency of choice about the available university–MNE cooperation forms.

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Исследование форм взаимодействия университетов и многонациональных корпораций в сфере информационных технологий в России

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В данной статье анализируются преимущества и формы сотрудничества между университетами и промышленностью, а также обсуждается роль академического участия в многонациональных корпорациях (МНК) в связи с решением об интернационализации НИОКР в принимающих странах. Различные случаи академического участия рассматриваются на примерах российской ИТ-индустрии, предлагается классификация моделей сотрудничества, целью которой является разъяснение и упрощение принятия управленческих решений в отношении выбора подходящей формы сотрудничества между университетами и промышленностью.

В исследовании используются как вторичные, так и первичные источники информации. В первой части исследования были проведены углубленные интервью среди менеджеров программ академического взаимодействия МНК, работающих в ИТ-индустрии и российских университетах. Вторичные данные используются для выявления и анализа существующих практик в соответствии с предлагаемой категоризацией форм сотрудничества между университетом и промышленностью. Кроме того, приводится успешный пример академического участия Dell EMC в России, отражающий направления будущих исследований, а также подтверждающий предлагаемую авторами категоризацию.

В результате анализа, преимущества взаимодействия между наукой и бизнесом (академического участия в деятельности МНК) были сопоставлены с трудностями, с которыми сталкиваются МНК при разработке своих стратегий НИОКР, и был рассмотрен вопрос о локализации и интернационализации. В статье сформулирована классификация моделей сотрудничества между университетом и промышленностью, поскольку были определены и описаны формы таких партнерских отношений. Исследование раскрывает важные проблемы для МНК в очень специфическом и мало изученном аспекте, касающемся взаимодействия между университетами и промышленностью. Результаты работы могут быть использованы как другими исследователями, так и специалистами-практиками, которые интересуются российским рынком или выбирают между различными формами сотрудничества с университетами.

Ключевые слова: сотрудничество между университетами и отраслями, МНК (многонациональные корпорации), академическое участие, стратегии в сфере НИОКР (исследования и разработки).

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