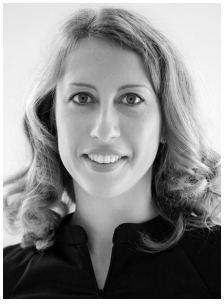
Exploring forms of academic engagement for MNEs in the Russian IT industry (Part II. University–industry cooperation models, EMC corporation case study)



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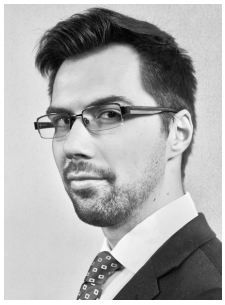

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In this article, the benefits and forms of university–industry cooperation are analyzed, and the role of academic engagement for MNEs is discussed in relation to the decision to internationalize R&D in host countries. Different forms of academic engagement 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.

Exploring forms of academic engagement

Therefore, we propose an integration-location matrix of university–industry cooperation forms as depicted in fig. 1, in which the two categorization criteria applied by practitioners to distinguish between forms are used simultaneously, resulting in a suggested division of the forms into 4 distinctive models of cooperation. Based on secondary data — the descriptions of academic engagement programs available from the partners' websites — we allocated the forms of cooperation existing in the Russian IT Industry according to the matrix

Integration	*High*	**Firm-based cooperation:** • Educational programs established by companies at their own premises • Corporate universities	**University based internal cooperation:** • Joint R&D centers • Joint education centers
	Low	**Third-party premises-based cooperation:** • Open platforms • Business incubators and technological parks	**University-based external cooperation:** • Contract research • Joint educational programs
		Company-based	*University-based*
		Location	

Fig. 1. Integration-location matrix of industry–university cooperation forms

quadrants and provided a description and examples for each of them.

1. University-based internal cooperation (see fig. 2) implies that the collaborative platform is located at the university premises in close integration with the university organizational structure and processes. The following forms of university–industry partnerships can be classified under this model: joint R&D centers, basic departments and chairs, contract research, licensing, patenting and educational programs established together with the company.

The partnership in the form of joint R&D centers could range from independent cooperation defined by the partners' needs in information and means exchange to a deep firm involvement accompanied by strictly defined aim and plan of research [1]. The MNE has the possibility to directly communicate with the university professors and experts and fully exploit the knowledge base available. Examples of joint R&D centers implementation under this model in Russia are, among others, the joint R&D center of the EFKO Group at Kazan National Research Technological University [2], joint Microsoft Research center at Moscow State University [3], and Cisco's innovation center at Ural Federal University [4].

Joint education centers or basic departments and chairs, as they are often called in Russia, represent a form of university-based internal cooperation with the MNE, when special chairs, centers or departments are established by MNEs in the university with the purpose to coordinate students' education programs so that they are relevant to the specific company's needs. They carry out all the functions required by the educational process for the students involved, and the close-knit connection to the industry ensures the adequate specialist preparation and cooperation of the intellectual corpus of universities with the industries [5]. As a result, the students acquire the necessary practical skills, and companies get the opportunity to hire best specialists early on [6]. One example of this model implementation in Russia is SAS's basic chair at the Moscow State University [7].

2. University-based external cooperation model (fig. 3) implies that the collaboration platform is located at the university premises; however, it is not directly affiliated with the university. The following forms of university–industry partnerships can be classified under this model: contract research and joint educational programs.

In the case of contract research it is also possible for the collaborative platform to still be university-based and yet not be structurally embedded in the organization design and hence be integrated with internal processes of the university. According to open sources, Russian universities and companies engaged in contract research are the Tomsk State University of Control Systems and Radioelectronics partners with Mikran [8], and ITMO with its undisclosed partners [9]. At St. Petersburg State University, a special unit is established specifically for contract research purposes [10].

There isn't always a need for creating a joint center for the MNE to introduce or co-develop an educational program. Another form described by the current model is the creation of joint educational programs [11]. Similar to a corporate university, such educational programs are developed for educational purposes per request of a certain business. However, they are embodied at universities and award an academic degree upon completion. The main characteristics of this form of cooperation are the following: the classes are centered on real-life and relevant problems; the students take part in the formation of the curricula; the tasks are related to the students' ongoing projects at work. In Russia, this form of cooperation can be observed in implementation at the Graduate School

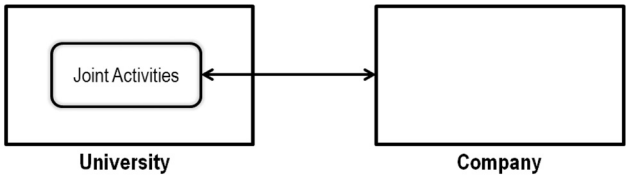

Fig. 2. University-based internal cooperation

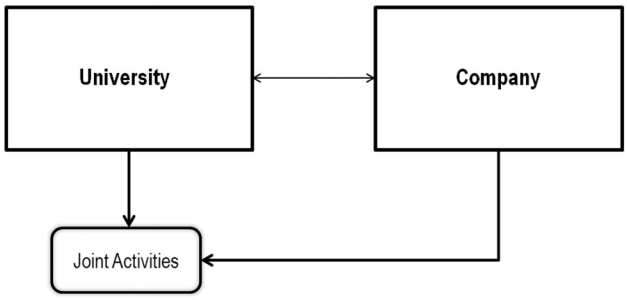

Fig. 3. University-based external cooperation

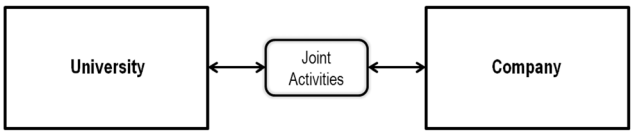

Fig. 4. Third-party premises-based cooperation

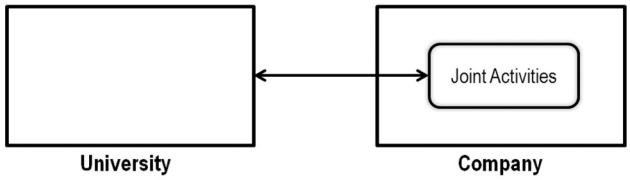

Fig. 5. Firm-based cooperation

of Management, St. Petersburg State University with a number of corporate partners [12], and at Moscow International Higher School of Business in cooperation with Mil Moscow Helicopter Plant [13].

3. Third-party premises-based cooperation model (fig. 4) suggests that the university and the MNE, either together or in collaboration with other universities or companies, establish an external center or platform for cooperation. Communication flows in this model are independent as well. The following forms of academia engagement can be classified under this model: open platforms, technological parks and business incubators.

Open platforms are often established as communities of practice [14], and have been studied in the context of university–industry cooperation for a relatively short period. Open platform is a platform that facilitates information and knowledge exchange between the participants from the industry, academia, and outside of both spheres. The platform is not limited by the number of participants or their affiliation, and therefore, a larger number of companies and universities can participate in the knowledge exchange and projects search. Results of a study by Iskanius and Pohjola (2016) [15] of an open platform functioning across Russia and Finland had shown that the efficiency of R&D projects increased as the representatives of the business and academic establishments explored the opportunity to get to know each other, enter into trustful relationships and plan their future cooperation. An example of open innovation platform establishment is the European-Russian InnoPartnership uniting five St. Petersburg universities and 6 companies, including Cisco and Digiton Ltd. [16].

Incubators and technological parks (technoparks) as forms of university–industry cooperation are widely spread in international practice. Clarysse (2005) [17], among other researchers, defines the network relationships between a company and a university involved an incubator or a technopark as one of the main sources of the competitive advantage and effectiveness factors. Under such conditions, the partnership between the two sides is mediated by means of an incubator or a technopark: the company is able to acquire ideas, projects, licensing from incubator or technopark residents. The residents, in their turn, are assisted by experts, research teams and university curators in developing and presenting their ideas. Such collaboration can also allow for the early discovery of promising technological platforms developed by students and subsequent talent acquisition, as often many incubator and technopark residents are, in fact, students or recent graduates. An example of university, company, and business incubator collaboration is the First Saint Petersburg business incubator that cooperates with the Russian Presidential Academy of National Economy and Public Administration from the academic side and ERIKON Group and Lissant Ventilation Plant from the corporate side [18]. Currently, there are 12 high-tech technological parks listed at the Ministry of Telecom and Mass Communications of the Russian Federation [19]. Among their partners are various higher education institutions and such companies as Microsoft BizSpark, 1C Bitrix [20], Intel and Cisco [21].

4. Firm-based cooperation model (fig. 5) implies that the collaboration platform is located at the premises of the MNE and is integrated to its structure and business processes. The following forms of academia engagement can be classified under this model: corporate universities and educational programs established by companies at their own premises.

Strongin and Maximov (2005) [22] note that in case of MNEs in Russia educational programs established by companies at their own premises are one of the most popular forms of university–industry partnerships. In some cases, the courses for the program are developed with assistance of university faculty, but in many other cases companies establish their own educational programs and recruit students at target universities without additional university involvement. One of the main goals of such activities from the side of the companies is to ensure that young graduates' preparation level is high enough for the demands of the industry. Examples of such programs are the T-Systems Test School [23], JetBrains' internship programs [24], and DigitalDesign IT University [25] operating in St. Petersburg, Russia. Sometimes, when there is a need to design a complex system of programs that requires a more complicated organizational structure, companies choose the form of a corporate university, understood as 'any educational entity that is a strategic tool designed to assist its parent organization in achieving its goals by conducting activities that foster individual and organizational learning and knowledge' (Allen, 2002, p. 9, [26]).

As seen from the review, the forms of academic engagement are numerous, and to our understanding, the proposed matrix represents a convenient instrument that maps the forms within one framework. It allows seeing the options an MNE has if the decision to internationalize R&D via academic engagement is made, and names benchmarks for each form and model, which can be investigated by the company further, if necessary. However, the relations between cooperation forms are currently largely understudied, as it is unclear how to choose between and within the matrix quadrants. We see here a direction for future empirical studies, which would both contribute to the research stream and help companies, which are looking for an optimal model of academic engagement.

EMC corporation case study

Further contributing to the discussion of forms of academic engagement and their role for MNEs, a case of Dell EMC will be discussed; the differences between the proposed cooperation models will be described as they appear in practice and with regard to the real managerial decision-making process of a large MNE; additional implications will be made with regard to possibilities for application and improvement of the proposed categorization of academic engagement forms.

The St. Petersburg EMC Center of Excellence has opened in 2007 and currently employs about 280 people, and is a part of a global corporate program of investments into R&D, which is held by EMC Corporation. The corporation has recently completed a merger with Dell Corporation and is now known by the name Dell EMC (further referred to in the study as «EMC»). EMC aims to accelerate the development of the corporation as a whole through design, development and support of unique high-tech solutions in the areas of cloud computing, effective storage, information management and efficient workflow [27]. Up to this date EMC has been working with various universities in order to create interest among students to pursue a career in the IT sector using various models of university–industry partnerships: joint R&D centers, educational programs, contract research, student research and others.

The following case description is based on primary data collected from interviews from all actors of the knowledge exchange involved in the academic engagement practices, which are described in the case: representatives of EMC Russia Center of Excellence management, academics, students and academic engagement programs coordinators from the side of the partner-universities. The sample consisted of the universities, which have joint educational programs with EMC and are involved in the functioning of existing joint R&D centers. The intention of the interviews was mainly to identify the decision-making process behind choosing the forms of academic engagement.

University–industry cooperation models of EMC corporation

Initially EMC launched a special educational program named «EMC Academic Alliance», which offered a unique system of open training for professors and students in the form of guest lectures and training sessions in areas such as: cloud computing, big data analytics, management and storage of information and data protection. The sessions were mainly held in local education centers on the premises of EMC offices or on third-party venues. As a result, this program helped developing a portfolio of training courses in the curriculum of dozens of universities. Although they found success in creating a professional network of experts and universities in the Russian market, the chosen collaboration model made it difficult to systematically create and maintain interest in the industry and the company: contacts with the majority of program participants got lost soon after the end of these short-term programs. This led to a reorientation on creating programs and ventures, which would allow to constantly stay in touch with the participants, offering them new opportunities to collaborate.

Therefore, EMC decided to pursue partnership models that would enable approaching the students during each year of their studies (see fig. 6). As a result, up to this day the best first year students from six leading partner universities selected from those students, who had successfully passed their first exams session, are paid a grant during the following spring semester. The purpose of the grants program is to motivate young people to choose a profession related to the profile of the IT industry. For the second year bachelor students, EMC suggests taking part in an external mentoring program, in which during the two following semesters students have the opportunity to work with and be mentored by company experts. Students of the third and fourth years are suggested to take part in the process of solving real technological challenges that EMC faces through joint student projects (4-7 members) guided by a scientific advisor from the partner university and a company representative. For master students, EMC offers a paid internship program with the subsequent opportunity to get full-time jobs in the company. Furthermore, the second year master students of partner universities have a chance to get funding for implementation of joint research projects with EMC Center of Excellence.

Although the new model showed success in terms of solving the problem of the lack of systematized communications, the number of students, who participated in the programs and of those, who were just aware of the programs was not sufficient. As a result, EMC realized that a continuous cooperation with students and professors of leading technical universities is not enough: EMC also needs to have a constant presence at the university itself to insure awareness. The chosen model of partnership was a joint educational and R&D center.

Based on the long-term relationships between EMC and Polytechnic University in St. Petersburg, it was decided to open the first center there. The joint educational and R&D center of EMC and Polytechnic University was opened in 2014. It focuses on joint research and teaching courses, which are to contribute to the training of highly

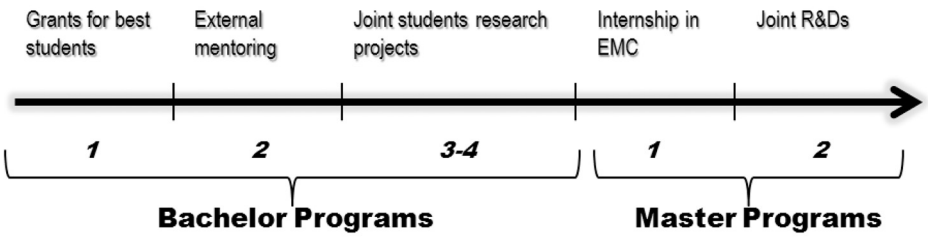

Fig. 6. EMC Educational Programs with key partner universities

qualified personnel in the areas of storage and processing of information and data in accordance with the standards of EMC. Soon after, a decision was made to create one more joint R&D center with another partner university from St. Petersburg – ITMO University. Just as the first center, the «EMC – ITMO University» center would take part in development of joint research in the field of IT and in introduction of new applied disciplines using modern software products into the educational process. The center would also present a co-working area for students participating in educational and research projects of the company and the university [28].

As a result, the number of participants in joint projects grew rapidly, and the number of students, who are willing to participate in joint programs is currently higher than in any previous year of collaboration. By providing all the needed conditions to manage joint projects (which include special co-working area and also high-capacity equipment), EMC successfully increased loyalty of students inside the University, which is evident by the increased rate of students coming back to joint programs the next year.

With the increase of students, more student projects appeared: previously the Polytechnic University together with EMC had accomplished no more than one project per year, but after the creation of the center the number increased to three new projects per year. Constant on-campus presence improved the communication between the partners providing opportunity to organize joint guest lectures and round tables with students and professors on a regular basis.

The physical presence of the company on the territory of the university gave the ability to stay constantly in touch with students and professors creating a new marketing communication channel to the company, through which effective promotion is made possible. The continuous collaboration with the universities and constant joint research projects results in an increased number of news publications online as the information about joint events becomes widely spread through mass media, which otherwise might have be more difficult and expensive to achieve.

It's important to mention that the most advanced IT-companies like EMC widen their partnership relations in the regions where the best universities are concentrated. Saint-Petersburg is often called as an IT-capital of Russia because of the strong IT-skills of its students. From 2012 to 2017, the World Champion title at the ACM International Collegiate Programming Contest (ICPC) has been exchanged between two teams from Russia's cultural capital — ITMO University and St. Petersburg State University. In every country there is a couple of cities — so called educational centers, where there are a lot of talented students. That's why companies prefer locating their offices in these intellectual centers and develop joint projects including joint R&D-centers creation.

Discussion

As the university–industry cooperation model of the company transitioned from firm-based cooperation to university-based external cooperation, and then — to university-based internal cooperation, the extent of the MNE involvement in the joint activities changed dramatically. That resulted in increased efficiency for the company in multiple aspects: increase of the number of joint projects with universities, reputation, students' involvement and increased HR pool. Based on these findings, hypotheses for future analysis could be made on the relative effectiveness of various university–industry models of cooperation, and the role of location proximity and integration on academic engagement.

The case also highlights the dynamic nature of academic engagement. It shows that as the Dell EMC gained more experience in the Russian market, the need in cooperation with universities not only did not disappear, but on the opposite — has evolved, matured and become more complicated. This correlates with the findings in existing literature [29, 30] suggesting that university–industry cooperation has a dynamic nature and must be analyzed in a dynamic context. As a result of adaptation and organizational learning, different models of cooperation were required, and eventually had been found by the company as a result of constant experimentation. This also brings support to the assumption that the differences in potential benefits and abilities to help overcome certain MNE challenges between different forms of academic engagement are not evident for practitioners, require further analysis, and new instruments are needed, which could aid in managerial decision-making.

Conclusions and discussion

Pursuing collaboration with universities in host countries has an important impact on MNEs' contemporary growth and might lead to the creation of various competitive advantages for the company by helping to attract talent, getting market knowledge, facilitating innovation, and enhancing reputation in the foreign market. This can be depicted by the recent growth in the number of partnerships between the largest MNEs in the IT market of Russia and local higher education institutions. The analysis of drivers and forms of such cooperation practices helps to explain how it is possible to create value through academic engagement and contributes towards further transparency of the options an MNE has once the decision of starting collaboration with universities had been made.

In this research, two streams of literature have been used in a complementary matter: literature pertaining to R&D internationalization strategies of multinationals and research of university–industry cooperation. The review of scholarly work on university–industry cooperation allowed differentiating between the benefits of academic engagement, which may come to MNEs from the academics, the university, and the students. The main challenges of MNEs related to R&D internationalization were grouped 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,

4) the need to be embedded in informal networks. As a result, the benefits of academic engagement were aligned with the MNEs' challenges to highlight the importance of academic engagement for multinationals.

An empirical analysis of university–industry cooperation in the Russian IT industry has been conducted to support the discussion of academic engagement forms categorization. Interviews with university–industry programs managers have been conducted to make the choice among the main criteria, which were to be used in the categorization — «location» and «integration». Location reflects whether the cooperation is based on the premises of the university or the company, while integration describes the level, to which the collaboration platform resulting from such partnership is integrated into the host organization. Then, secondary sources analysis allowed to differentiate existing academic engagement examples and align them with the proposed integration-location matrix of university–industry cooperation forms, which categorized them into four models: third-party premises-based cooperation, firm-based cooperation, university-based internal cooperation, and university-based external cooperation.

Finally, the Dell EMC case has been used to illustrate the described drivers for university–industry partnership and their relation to the choice of forms of such cooperation. The history of the continuous adjustment of cooperation forms illustrated that such partnerships can be dynamic and over time change and evolve. Based on the fact that moving from one model of collaboration to the current one sufficiently increased the effectiveness of Dell EMC academic engagement practices, we proposed that further empirical investigation is required to study the relations and compare the effectiveness of the four models in order to propose a convenient decision-making framework, which managers would be able to use in their practices.

First of all, this work may be of interest to researchers studying innovation systems, knowledge sharing in MNEs, and university–industry cooperation, especially for the current lack of works on the Russian market. The results of this study may also be used by MNE managers facing the choice of localization versus internationalization of R&D, and who are interested in further analysis of what collaboration with host country universities can bring to the table. It can as well be used to find benchmarks and evaluate available options of various cooperation models by practitioners, who are interested in entering the Russian market or are choosing among different forms of collaboration with universities.

Limitations of the study

It is crucial to mention that although the possibilities for university collaboration may be considered important for MNEs, we acknowledge that there are various other essential economic and legal factors, which often affect the decision to engage in R&D practices in emerging markets [31]. By choosing to focus only on factors, which relate to university collaboration, we do not try to diminish the importance of those internationalization drivers, but rather set the scope and limitation of this study to avoid the following discussions, which, although related to the topic, would have moved the discourse to a different direction.

From the one hand, research shows that market potential, population income growth, cost differences and favorable public policy can considerably shape the attractiveness of countries for overseas R&D activities [31]. But on the other hand, these assessments are subject to the constantly changing political and economic situation in the countries (e. g., economic crises, import sanctions, political tensions, etc.), and thus are heavily determined by the country origin of the MNE, and the policies with regard to each particular industry. For example, during the last two years, various reports indicated that Microsoft, Oracle, Symantec and Hewlett-Packard would implement anti-Russian sanctions as they block the possibility to update their software to Russian companies indicated in the «black list» [32, 33]. At the same time, there has been no information on the closure of joint R&D centers or downsizing of university–industry collaboration in Russia. Some experts predict an upcoming hype in the market as Russian companies would like to purchase foreign IT solutions in bulk being afraid that it will be forbidden in the nearest future, while others predict a decline in demand soon to come as a result of successful import substitution [34]. Many also expect no alterations to the demand structure, hoping that the recent change of the US government will lead to an overall stabilization of the political situation in the Russian economy [35]. In leaving these sets of factors beyond the scope of the study, we acknowledge that they have a lot to do with the studied phenomenon, but also believe that their inclusion would have been distracting from the main discussion.

Another set of factors, which wasn't included in the scope of the study, is related to the difficulties of negotiations on intellectual property between firms and universities. It is known that in emerging economies the private sector is often discouraged from collaborating with the public sector because of the difficulty of negotiating ownership of intellectual property from research relationships and protecting of intellectual property [36]. However, Thursby and Thursby (2006) [31] found that these factors are not as strong R&D internationalization factors as the other ones. It is described that many companies are signaling their technical and scientific capability, attracting potential partners and opening up new opportunities for collaboration as they disclose knowledge through scientific publications, conferences, patents and the Internet [37]. The uncertainties regarding matters of property rights, intellectual capital contribution evaluations and government installment of legal infrastructure are discussed and being sorted up in other research [38, 39], and are beyond the scope of this study.

Further research

We see a strong need in further empirical comparison of the different forms and models of university–industry cooperation with the aim of creating instruments and algorithms that would help practitioners to efficiently

determine the best way to design such partnerships. More empirical support is needed to discuss the comparative effectiveness of different models for the MNE, and how such factors as legal constrains, market growth assessment and other factors excluded from the current analysis would affect the effectiveness and managerial decision-making in a dynamic perspective.

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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).