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CONCEPT FOR PERFECTING THE MARKETING OF NEW TECHNOLOGIES AT GDAŃSK UNIVERSITY OF TECHNOLOGY

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Introduction

Many contemporary universities, including those in Poland, focus primarily on their teaching and research-scientific activities, and pay little attention to the needs of economic practice and the market. There is a small group of people of science who understand and implement in practice the economic mission of universities and research and scientific units, as key providers of new ideas in the knowledge-based economy which is gaining importance day by day. Many scientists focus merely on the statutory activities of the institutions employing them, which are now generally limited to educating and scientific research. To some extent, this results from statutory requirements ordering education and scientific research, promoted by the binding criteria of parametric assessment of scientific and research units. This is also, to a degree, the effect of convenience and lack of will to go beyond the well-known areas and modes of activity typical of a substantial proportion of the scientific and teaching staff. Little interest in economic practice in many university circles may also in many cases be the effect of lack of sufficient knowledge about its needs and the inability to recognize them. This could suggest that people of science are not open to changes in their environment and that they are too focused on their own areas of activity.

One of the reasons for this state of affairs is the limited knowledge of those scientists and managers of science of the role and possibilities of contemporary marketing. In common understanding, marketing is associated with promotion and advertising. People who deal with economic practice, including scientists, regard marketing as the equivalent of advertising and promotion, and they regard promotion as the art of manipulating recipients, which is not a fitting activity for an honest engineer, economic expert or scientist. In this way many of them avoid the duty of proper understanding of the essence of marketing and the need to try to find out how marketing could be used to take advantage of the results of their scientific and research work. This issue is the leading topic of this article.

Based on the experiences of the Gdańsk University of Technology, in order to contribute to the improvement of the transfer of new technologies to economic practice in Poland, the following issues are discussed in the article:

- The essence, benefits and environment of contemporary marketing,
- New technologies, their role and the rules for transferring them from scientific and research centres to the economy,
- The experiences in technology transfer from the Gdańsk University of Technology to the economy,
- Proposals for facilitating the marketing of new technologies from the Gdańsk University of Technology to the economy,
- Conditions for facilitating the marketing of new technologies from university to economic practice in Poland.

All these deliberations end with a summary and a formulation of final conclusions.

The essence, benefits and the environment of contemporary marketing

There are many definitions of marketing, which is constantly subject to dynamic development. It is also a field for the creation of new ideas and approaches. For the purpose of this article it seems appropriate to adopt the definition of marketing formulated by renowned experts like G. Armstrong and P. Kotler. According to them, the term marketing denotes a „...*process in which companies produce a value for the client and build strong relations with clients in order to gain particular values in exchange*”¹.

To understand contemporary marketing it is necessary to identify its characteristics, which are discussed below².

- Marketing is based on voluntary acts of exchange on the market, in which the seller (supplier) offers a product to the buyer, gaining payment and other considerations significant to the seller³. Products now exchanged on the market are perceived from a very broad perspective. They can assume the form of a material product, a service (actions taken in order to satisfy the buyer’s needs), person, place, organization or a combination of the above elements.
- An incentive for the initiation of the process of exchange on the market are the needs and desires of all participants in the market game, understood as a perceived lack stimulating an entity, which feels the need to take action. Among the individual needs of the participants of market exchange, classified by Maslow⁴, we can distinguish between basic needs like physiological needs (e.g. breathing, hunger, thirst) and security (life, health, social security) and higher level needs like social needs (identity, friendship, love), personal (renown, status, respect) as well as cognitive needs and self-realiza

1 G. Armstrong, P. Kotler, *Marketing. Wprowadzenie*, Oficyna Wolters Kluwer business, Warszawa 2012, p. 36.

2 Prepared on the basis of G. Armstrong, P. Kotler, *Marketing. Wprowadzenie*, Oficyna a Wolters Kluwer business, Warszawa 2012, p. 36; Doyle, *Marketing wartości*, FELBERG SJA, Warszawa 2003, p. 8-17.

3 This involves repeating purchases, expressing one’s good opinion about a provider and promoting the provider without any outside pressure among friends or business partners, reacting to new propositions of the provider etc.

4 P. Baines, Ch. Fill, K. Page, *Marketing*, Oxford University Press, Oxford 2008, p. 113-114.

tion. Whereas needs are limited and constant, the desires formed by culture and individual personality of a particular entity assume various shapes and are subject to frequent changes.

- In the contemporary market, marketing is now frequently not about the exchange of products and payment, but becomes a field for the exchange of benefits in the form of values expected by the parties in transactions. The product is treated as a carrier of value transferred to the buyer. The reception of the value becomes the basis for the expectation of values important for the buyer⁵ in return. This is the reason for the significance and attachment to diligent recognition of the needs and expectations of recipients, as well as to following their reactions to the values offered, in order to be able to introduce appropriate modifications to the offer on time and keep the buyers' interest in what the supplier can offer.
- Efficient client service is possible when it is correlated with the needs and desires of the clients it is supposed to serve. This is why it is so important to choose the target group of clients carefully in the process of market segmentation. Generally speaking, the recipients of the providers on the market may be individual clients - persons and/or families buying products for their personal consumption and organized clients buying products in order to use them in the processes of producing goods and/or providing services (producers), reselling products (agents) or for the purpose of carrying out statutory tasks (e.g. local administration, government, administrative organizations). Raising the likelihood that the offer of a market provider will be noticed and chosen by recipients can be achieved by equipping the offer with characteristics distinguishing it from the competitors' offers through the process of positioning.
- Companies in which activities are subordinate to the goals of marketing strategy can achieve competitive advantage and better results on the market. This means that a company taking up the task of serving clients tries to define its mission, which identifies the reason for the company's existence from the point of view of the clients. Moreover, companies define their marketing goals expressing the expected state (situation) on the market they are aiming at (e.g. achieving a 15% share of the market in 3 years). They also define the manner of operating on the market in the long term, often covering many years, called the marketing strategy.
- In order to satisfy the expectations of a chosen group of clients, companies build a set of instruments, which make sure that recipients are provided with the expected values. Among these instruments there are: *product, price, distribution and promotion*. Now this is often replaced by two-way marketing communication⁶. Marketing instruments described as marketing mix or 4P's, should be integrated, that is, coherent and mutually supportive and, at the least, not conflicting.
- The experiences of many companies focused on marketing show that what helps improve the results of market activities are positive buyer experiences from cooperation and buying, lasting, friendly

⁵ A seller who sells a food product to a customer, offers him the energy to work and act, health and the pleasure of eating, expecting in return payment, repeated shopping, expression of a positive opinion about the provider in his environment, or interest in a new proposition.

⁶ In the case of services it is necessary to expand the classic marketing mix (product, price, distribution, promotion) to personnel, physical evidence and process of provision organized adapted to the needs of recipients (7P's).

relations with buyers, which result in satisfaction or, at best, in their praise.

Marketing is not a one-off act or event. It is an unending set of recurrent actions carried out in a particular sequence in two main phases, namely (picture 1):

- producing the values expected by the clients and building cooperation with them, as well as
- obtaining from satisfied, loyal clients the values expected by the provider, which guarantee making profits, value in the life cycle of clients and capital in form of a loyal customer base.

The main beneficiaries of the application of marketing in business are clients (recipients) and entrepreneurs (providers) using it. Thanks to marketing the clients gain:

- A rich range of products constantly updated by providers who want to distinguish themselves from the others on the market,
- Full adaptation of the range often to their individual expectations,
- Protection of one's own interests, resulting from the nature of marketing and the assumption that providers achieve their goals thanks to their clients' satisfaction.

Providers (producers, service providers) applying marketing in their business activities gain the following:

- Optimum choice of groups/group of served clients, complying with the capacity and potential of the company,
- Direction of marketing goals and activities corresponding to the internal and external goals and the environment of a company,
- Appropriate adaptation of the offer to the expectations of recipients, bringing them satisfaction or even better, pleasure
- Partner relationship with the recipients, facilitating the survival, development and expansion of the company.

Broad utilization of marketing in the economy also brings other benefits, such as close ties between entities stabilizing the economy, popularity of planning, which facilitates balanced development of companies and the economy, as well as stimulating innovation, raising competitive potential of market entities and the attractiveness of the economy.

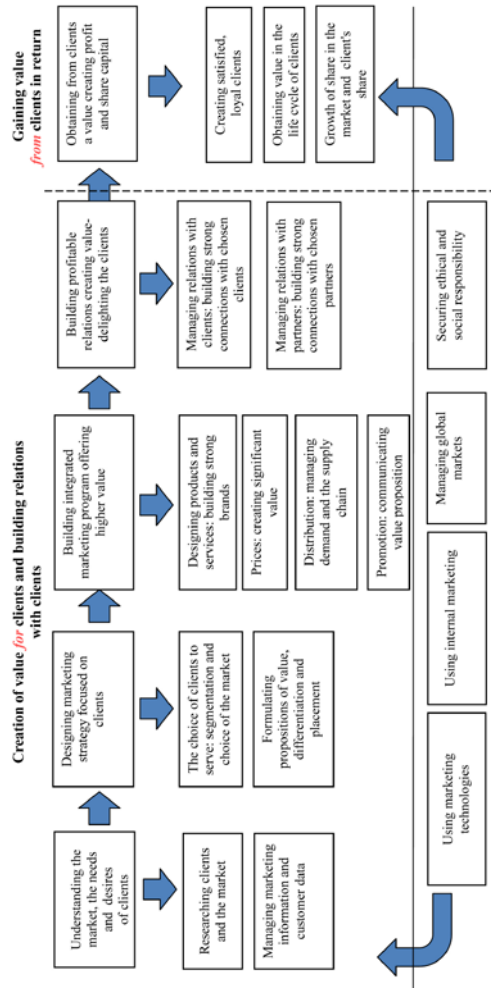
Achieving benefits thanks to the utilization of marketing requires satisfying a series of conditions.

The following are among them:

- The necessity to conduct marketing research and constantly collect data about the market, which requires managing marketing information and customer data,
- The necessity to constantly improve marketing activities and implement innovative technologies, especially information technologies based on computer support,

- Basing the activity of companies focused on marketing on internal marketing understood as activities aimed at the personnel, who are to improve service to the recipients⁷,
- basing internal and external activities on ethics, respecting the idea of social responsibility of business.

Picture. 1. Extended model of the marketing process.



Source: Prepared on the basis of: P. Kotler, G. Armstrong, *Principles of Marketing*, Pearson Prentice Hall, New Jersey 2008, p. 29.

7 In internal marketing every employee is treated as an internal client who requires similar diligence in cooperation to an external recipient. For this reason it is necessary to constantly monitor their expectations and work satisfaction, using motivation methods adapted to their expectations, rewarding desirable attitudes and behaviours, access to trainings, internal education and support needed at work, creating conditions for efficient interpersonal and public communication or integration of employees, units and departments (J. Koszałka, *Marketing wewnętrzny [in:] Podstawy marketingu. Problemy na dziś i jutro*, praca zbiorowa edited by. J. Perenc, Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, Szczecin 2008, p. 305-328).

New technologies and transferring them from scientific and research units to the economy

As has already been concluded, under conditions of ever greater competition on the market and the growing domination of the knowledge-based economy, benefits in the broad sense offered to recipients determine the competitive edge and success of a market provider. What influences the benefits for recipients is both the value of the products they receive and the benefits achieved thanks to the use of appropriate processes and their organization. Considering the fact that both in products and ways of producing and offering them technical resources play a major and in some cases a decisive role, it is possible to conclude that what determines a company's competitive edge on the market are the technologies used.

Technology⁸ can be defined as a method of preparing and conducting the process of creating or processing certain goods (including information). Technology may mean a particular process (e.g. the technology of attaching things, technology of safety), it may also mean knowledge about production with the use of technical resources. Considering the fact that nowadays products and services, which are in essence a process, are regarded as products, technologies as methods of production and/or processing have a key impact on every social or economic activity. Here it is necessary to distinguish technology and technique⁹, understood as an area of activity which involves producing phenomena and items not present in nature.

Contemporary technologies are subject to transfer understood as „...*transferring particular technical and organizational knowledge and the associated know-how for the purpose of commercial utilization.*”¹⁰ Know-how¹¹ means non-patented practical knowledge obtained thanks to experience and research, which is:

- secret, thus, it is not commonly known or available
- essential, that is, important and useful from the point of view of activity it concerns,
- identified, that is, described in a sufficiently comprehensible way, so that it is possible to check whether this knowledge satisfies the criteria of secrecy and importance.

Transfer of technology takes place between:

- the sector of science and research and the sphere of commercial activity,
- within the economic sphere, between companies,
- individual investors and companies.

Thus, the participants of the transfer of knowledge are research-scientific units, companies of various sizes, private individuals and public institutions. Transfer of technology is carried out by means of¹²:

- research and development work, conducted by research and development units, ordered by big
- companies, agencies and government programs,
- direct investments, cooperation and merger of companies,

8 <http://pl.wikipedia.org/wiki/Technologia>, 23.10.2012

9 <http://pl.wikipedia.org/wiki/Technika>, 22.10.2012

10 K. Matusiak (ed.), *Innowacje i transfer technologii. Słownik pojęć*, PARP, Warszawa 2008, p. 354.

11 *Ibidem*, p. 170-171.

12 *Ibidem*, p. 355.

- trading patents¹³, licences¹⁴ and know-how on the technology market,
- purchasing machines and technical devices which inspire the buyers with their design or mode of operation to copy the devices or create improved solutions,
- the process of formation thanks to which students and participants in training sessions can transfer knowledge to professional life,
- scientific and popular science publications, conferences, seminars, fairs,
- direct contacts and exchange of experiences between scientists and individual inventors with people dealing with practical application of knowledge
- apprenticeships and exchange of employees of research and development units and universities with companies,
- following (copying) foreign solutions.

Research and development work¹⁵ is understood as systematically conducted creative activities serving the purpose of solving problems not coming in an obvious way from the current state of knowledge, which have apparent traits of novelty. They cover:

- basic research, which means theoretical or experimental work started mainly in order to gain new knowledge about the phenomena investigated,
- industrial research (applied), serving the purpose of acquiring new knowledge and skills in order to work out new or improve existing products, services and processes, including the creation of components of complex systems,
- development work, which involves gaining, combining, shaping and using available knowledge and skills from the area of science, technology and commercial activity for the creation of projects for new products, services and processes, preparing prototypes and pilot projects, as well as testing them (assessment).

Technology transfer in cooperation and mergers of companies in the course of direct investments can be carried out *joint-ventures*¹⁶ between two or more entities, independent in economic, legal or administrative terms. This makes it possible to reduce the risks of a venture, especially technical, market or financial risks, thanks to joint use of the results by all participating partners.

Currently, technology transfer also covers such forms of activity¹⁷, as:

- academic entrepreneurship, which involves the use of results of research and development works by students and young scientific employees, as well as launching small technology companies within

¹³ Patent is the term colloquially used to denote the document received from the Patent Office which confirms the right to use an invention understood as a new solution or idea, which doesn't belong to the current state of technology (it has inventive characteristics) and is suitable for industrial application [K. Matusiak (ed.), *Innowacje ... op. cit.*, p. 235, 377-378].

¹⁴ Licence is an agreement which grants the power to exercise exclusive rights to an invention, a design (new and useful solution of technical character, concerning shape, structure or composition of an item of durable form), industrial pattern (new, or individual in character, form of product or its part, determined in particular by the traits of its lines, outline, shape, colours, structure or materials or by its ornamentation), topography of a circuit board or a work which is subject to copyright, including trademark [K. Matusiak (ed.), *Innowacje ... op. cit.*, p. 191; 384; 385].

¹⁵ K. Matusiak (ed.), *Innowacje...*, *op. cit.*, p. 66-67.

¹⁶ *Ibidem*, p. 163-164.

¹⁷ *Ibidem*, p. 355; 281-285; 334-336; 199-202.

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- academic technology incubators and university technology transfer centres,
- functioning of systems of support for innovative ventures offering consulting, technological mediation, initiating transfer, information about new technologies etc. with financial and organizational support for activities with public funds,
 - supporting innovation in small and medium companies which can implement them faster, cheaper and more efficiently than big companies, which makes it possible to modernize industrial structure faster and facilitates the development of regions,
 - initiating cooperation within such network solutions as clusters¹⁸ or branch group of companies. Under market conditions technology transfer assumes the following forms¹⁹:
 - active, equivalent to commercialization of technology, understood as a combination of actions serving the purpose of transforming knowledge and new technological solutions into products (goods, services, processes) which can be sold on the market and bring revenue,
 - passive, meaning acquisition and protection of knowledge, transfer of information and the development of implementation work.
- Transfer of technology may be²⁰:
- commercial in character (trade), covering the sale of goods (material products), trading licenses and sale of information in its broad sense,
 - non-commercial, when it takes place thanks to knowledge transferred free of charge (studies, apprenticeships), through professional associations, transferring licenses free of charge or transferring knowledge within companies (especially international companies).
- Taking into consideration the mechanism of transfer of technology we can distinguish between²¹:
- horizontal transfer of technology, that is, the flow of knowledge and solutions between companies, through the sale of patents, licenses, *know-how*, industrial cooperation²², technical services, material assets, as well as *joint-ventures*,
 - vertical transfer, when new solutions are transferred to companies from the public sector of research and development (R&D), mainly through research ordered by companies, sale of inventions, licenses and designs, scientific-technological consulting, training and transfer of personnel, setting up spin-

18 Cluster is a spatial concentration of companies, institutions from the sector of science and technology and support institutions connected through a complex network of formal and informal links, which both cooperate and compete with each other, which creates an effective environment for the development of innovative initiatives [K. Matusiak (ed.), *Innowacje ... op. cit.*, p.167-169; *Innowacje - co jest co? Urząd Marszałkowski Województwa Pomorskiego, Gdańsk 2006*, p. 25-26].

19 K. Matusiak (ed.), *Innowacje...*, *op. cit.*, p. 355; 171-172.

20 *Ibidem*, p. 355.

21 *Ibidem*, p. 356.

22 Industrial cooperation can be understood as cooperation between companies where one of them provides material goods or services ordered by, and according to the requirements of the other company. It is necessary to distinguish cooperation from other forms of collaboration, especially trade cooperation, where the transaction of exchange concerns standard products, which do not force the provider to prepare products specially adapted to the needs of interested clients, it also doesn't limit the freedom of decision-making of any of the partners (supplier can sell standard products to various buyers, the buyer can buy standard products from various suppliers). [Prepared on the basis of: J. Lichtarski (ed.), *Współdziałanie gospodarcze przedsiębiorstw*, PWE, Warszawa 1992, p. 25].

off companies²³ and also presenting publications through seminars and scientific conferences.

From the economic point of view, transfer of technology is characterized by a series of specific traits. Among them are the following²⁴:

- monopoly in case of many technologies and innovative solutions and in many segments of the market,
- weak bargaining position of buyers of technology, resulting from insufficient knowledge about the details of solutions subject to cooperation and trade, but above all the difficulty or even impossibility of replacing the provider of a new technology with another provider,
- comparably easy segmentation of the market, both with regard to recipients and suppliers,
- comparably strong geographical concentration of supply and demand for technology associated with the specialization of research and development units and the branch and territorial location of potential recipients - buyers of technology,
- strong correlation between licensing and patent protection of solutions and exports of unique products saturated with technology, because the owners of patents and licensed solutions try to protect them above all on the markets of future expansion and sales,
- strong association of technology with direct foreign investments, which results straight from the will to offer innovative technologies on the markets where sales of the technology can bring the seller the biggest benefits,
- strong stimulation of the market in investment goods and the market in highly skilled labour, transfer and implementation of new technologies usually requires creating infrastructural conditions adapted to the new requirements, equipment, software, know-how and personnel competences,
- much deeper and stronger associations between recipients and suppliers of technology than in the case of exchange of commercial goods, which is the result of the novelty of solutions that are the subject of cooperation, more frequent problems in the design, production, use and servicing phases, as well as the fact that the producer and the user have to solve these problems together.

As the above points show, many more factors influence the transfer of technology than a classic trade exchange in business. Because of the many unknowns it offers many chances, but also poses many risks for each cooperating party. In order to reduce the risk, it is necessary to have good knowledge of the environment and conditions under which the processes of technology transfer take place. Participants have to be open to emerging experiences and partners have to be ready to constantly improve their knowledge and skills.

²³ Spin out, or a spin off company is a new company established by a participant/participants of research conducted at a university, in a research-scientific unit or a company, using the results of research, information, knowledge and technical resources of the parent organization [K. Matusiak (ed.), *Innowacje ... op. cit.* p. 97].

²⁴ K. Matusiak (ed.), *Innowacje...*, p. 356.

The experiences in marketing and transfer of new technologies from the Gdańsk University of Technology to the economy

Gdańsk University of Technology is a leading technology university in the North of Poland. The history of the university started back in 1904, when the Gdańsk higher engineering school was founded. In 1945 this was the foundation for the establishment of the Gdańsk University of Technology²⁵. The university has 9 faculties. Currently, over 25,000 students attend engineering and master's courses. Among universities of technology in Poland, Gdańsk University of Technology placed 6th. The university employs almost 2,500 people, including 1,200 academic teachers. In 2012, for the second time, Gdańsk University of Technology received the „Uczelnia Liderów” (university of leaders) certificate awarded by Fundacja Rozwoju Edukacji i Szkolnictwa Wyższego and PR agency Przemysław Ruta Communication. For three years (2010, 2011, 2012) the university was the second most popular university among future students, according to the ranking of the Ministry of Science and Higher Education. It was at the Gdańsk University of Technology that the first independent parliament of students was established after the war.

Transfers of technology from the Gdańsk University of Technology have up till now been carried out in the following forms:

- Didactic transfer, thanks to which students gain knowledge, skills and social competences which they later use and develop in their professional work.
- Carrying out research and development work to satisfy the needs of companies and others in the course of ventures associated with the process of obtaining scientific degrees by scientific-didactic employees of the University.
- Carrying out joint research and development work (R&D) in the form of grants, by universities and manufacturing-service companies (about 15 new projects a year).
- Carrying out R&D work ordered by companies and government, as well as local administration agencies, of various natures, levels of difficulty and innovativeness for the developed solutions (at least 300 orders a year).
- Sale of patents and granting licences to commercial entities by the University, which means trade with non-material and legal values (10-15 contracts a year).
- Direct investments and commercial ventures (spin-off) - preliminary stage. Currently, Gdańsk University of Technology cooperates in this respect with the Pomerania Development Agency and is carrying out the process of pre-incubation of 3 projects.
- Scientific and popular science publications, which are one of the basic ways of transferring technology from the University to commercial practice excluding didactic transfer and carrying out research and development work and research and development projects.
- Apprenticeships of scientific-research employees in production-service companies, in the current organizational-legal environment these are relatively rare.

²⁵ Information materials of the Gdańsk University of Technology.

- Personal contacts at conferences and informal meetings of scientists, inventors and businessmen and exchange of experiences. Relatively frequently these constitute the first step towards closer cooperation between people, companies and institutions.
- Propagating information about new technologies by participation in science, invention, patent and innovation fairs, as well as occasional events and publications.
- Initiating and maintaining a network of cooperation, including main contribution to the establishment and functioning of the Pomeranian Cluster ICT and WiComm Centre of Excellence.

As the above list shows, the spectrum of past forms of technology transfer from the University to commercial practice is quite broad. However, it is necessary to remember that the list is dominated by traditional forms of cooperation, and in the knowledge-based economy these are regarded as inefficient. There are a few projects and ventures of high economic significance, which are based on the initiatives of scientists actively cooperating on solving particular problems of regional and especially national and international economy.

Marketing is used in the transfer of technology from the Gdańsk University of Technology to the economy. Its role can be characterized as follows:

- Operating a database of competences of scientific and research employees and teaching employees of the University (Platforma Informacji o Nauce - PION), which constitutes an element of the activities in the area of internal marketing at Gdańsk University of Technology.
- Research on clients and the market focused on the needs of chosen projects, areas and companies, including development of renewable energy sources - in cooperation with ENERGA, extraction and utilization of shale gas, and the Cool ID project, which involves working out and implementing new, intelligent labels for packaging of frozen food.
- Fragmentary management of customer data limited, however, to projects carried out by particular research teams (e.g. in the ICT cluster).
- Segmentation and the choice of markets and clients in chosen projects, e.g. the projects carried out with ENERGA.
- Formulating client value propositions, limited mainly to technical values.
- Designing goods and services - building strong brands, which concerns mainly laboratory services and brands of units providing services, e.g. Strength Tests Laboratory or Marine Center of Military Technology.
- Distribution of offers (products), which concern mainly services and do not constitute offers in the commercial sense (they are not systemic in character).
- Promotion of inventions, patents and solutions by means of such initiatives as fairs, scientific conferences, publications, brochures, access on Gdańsk University of Technology websites, etc.
- Building strong relations with clients and managing relations - by now carried out at the level of working teams e.g. in the ICT cluster, together with chosen partners.

The role of marketing and experiences in the transfer of new technologies from Gdańsk University of Technology to the economy can be assessed in the following way:

- Fragmentary use of marketing for the preparation and implementation of research and development projects, this is still based almost exclusively on the competences of project managers in this area.
- Formulation of projects and research-scientific ventures is aimed mainly at satisfying formal requirements of contests and the defined criteria of assessment, at the same time the needs of future users of research results are not sufficiently considered.
- There is a lack of common understanding of the necessity to recognize the needs and conditions for activity by future users of research results and their clients – the level of awareness that changes in this area are necessary is also low.
- Directors and teams carrying out research and development ventures do not have at their disposal the skills and tools for conducting marketing research on future users of research results and their clients. Products offered to the users of research results are based on results and conclusions from research, but do not constitute a comprehensive offer of a complex solution to the clients' problems in their whole complexity.
- There is a lack of unequivocal standards of running price policy, distribution and promotion in the implementation of orders for research and development work.
- In case of every research-development project (grant) individual solutions concerning the design and implementation of distribution and promotion of innovative technologies are prepared; until now there has been no attempt to build appropriate know-how, making it possible to use earlier experiences of other teams in these areas through the standardization of possible procedures of action.

As the above points show, at the University the application of marketing in the implementation of R&D projects and ventures, as well as provision of services, is fragmentary. Marketing at the University is not yet a foundation of the organization's activity on the market, clients and providing them with expected values. This stems from the fact that the basic funds for the functioning of the University are obtained outside the market. The satisfaction of the recipients of the University's products - external clients - is still not the most important criterion for the choice and assessment of didactic, scientific research, and development work. In the functioning of a public university other criteria play the most important role: getting grants, developing the portfolio of scientific achievements of individuals and scientific units or achieving a high mark in the parametric assessment of scientific units carried out by the Ministry of Science and Higher Education.

Proposals and conditions for improving the marketing of new technologies at the Gdańsk University of Technology

Taking the shortcomings and problems of past marketing activities concerning new technologies in the process of transfer from Gdańsk University of Technology to the economy into consideration, it is possible to formulate a series of proposals that would bring about improvement. The most important are presented below:

- It seems possible to assume the taking into consideration of the needs of market recipients from the very start of work associated with the preparation of teaching-training offers, but above all, scientific-research, development and service work. It would be advisable to work out standards for the preparation and implementation of ventures which constitute the market offer of the University, taking into consideration the requirements and indications of marketing, which raise the value of products for potential recipients and users.
- It is necessary to launch the process of collecting experience (know-how) from the implementation of research and development work on the level of specific departments and the whole University and creating procedures (standards) for solutions in this respect.
- Standards of implementation of R&D work with the consideration of requirements and possibilities of marketing, so that they could be created in such areas as:
 - client and market analysis,
 - investigating the needs and the environment for the functioning of potential clients,
 - analysis of competition,
 - recognizing legal environment for a project in the area of intellectual property and commercial law,
 - economic and financial analysis and choice of solutions,
 - preparing business offer based on the results of research and development work,
 - shaping prices and the policy of payment for research and development work,
 - distribution and promotion of the results of research and development work,
 - ways of building lasting relations with clients and partners of university/projects.
- Standards of conduct in the implementation of projects carried out for external recipients could be prepared on the basis of the experience of a greater number of universities; this is also where they could be used and constantly improved,
- It is obvious that considering the individual character of each training course, research and development or service project and the variable conditions for their implementation, the prepared
- standards of conduct should be applied flexibly, taking account of the characteristics of each project.

As the above points show, there are rather large areas of the University's activity where it is possible to improve the transfer of technology to commercial practice by means of broader application of marketing. What could help are the results of the implementation and achievements of the venture „Skuteczne Otoczenie Innowacyjnego Biznesu” (Efficient Environment of Innovative Business) carried out on the

initiative of the Polish Agency for Enterprise Development (PARP) in cooperation with other institutions providing support for innovation. Its main goal was to „strengthen the potential and competences of innovation centres and exerting influence on the formation of advantageous institutional conditions for the improvement of innovativeness of the Polish economy”²⁶. As a result, recommendations for changes in the Polish system of technology transfer and knowledge commercialization were formulated²⁷. They are supported with a set of 25 methodical papers and many examples of good practice in particular domestic and foreign centres of innovation, including academic centres²⁸.

It is possible to formulate conditions that could help improve the marketing of new technologies and their transfer to commercial practice. The most important ones are presented below.

- Raising the status of implementations and adding commercial implementations to the set of criteria for the parametric assessment of scientific-research units (universities),
- Creating motivation and incentives for clients (entrepreneurs, institutions, government and local administration) to cooperate with R&D units and joint implementation of innovative solutions (e.g. thanks to tax breaks),
- Real consideration of risks in the assessment of ventures associated with innovations and the creation of a system that could reduce the risk at universities,
- Launching a pilot project on the utilization of didactic, scientific and economic potential of an academic unit, according to the concept of the 3rd generation university.

Conclusion

On the basis of the above deliberations it is possible to formulate the following final conclusions:

- The essence of marketing is providing value expected by the recipients who, if they are satisfied, are ready to allow the provider to achieve his business goals. This rather obvious rule should also be applied in relations between universities and the final recipients of the results of their work, especially on the market.
- Marketing can facilitate the transfer of technology understood as transferring knowledge and know-how for the purpose of commercial utilization. The participants of these processes base their decisions and actions on market rules. Basing them on the rules of marketing boosts the likelihood that all participants will be satisfied and successful.
- At Gdańsk University of technology the transfer of technology takes place above all in form of didactic transfers, carrying out research and development work for companies, obtaining scientific degrees, building networks of cooperation with scientific and commercial partners, as well as informal contacts between people.

26 K. Matusiak, M. Mażewska, R. Banisch. *Budowa Skutecznego Otoczenia Innowacyjnego w Polsce. Cele i założenia inicjatywy Polskiej Agencji Rozwoju Przedsiębiorczości, PARP Warszawa-Gdańsk-Poznań 2011, p. 7.*

27 K. Matusiak, J. Guliński (ed). *Rekomendacje zmian w polskim systemie transferu technolog i komercjalizacji wiedzy, Warszawa 2010.*

28 www.pi.gov.pl, 22.10.2012.

- Marketing in the transfer of technology at Gdańsk University of Technology is used to a limited extent, mainly in form of operating a database of competences of scientific and research employees, fragmentary research on the needs of chosen clients and market, as well as in form of promotion of inventions and patents.
- There are substantial areas of training-teaching, research-development and service activities, where the implementation of rules of marketing would improve the efficiency of the transfer of technology from the university to commercial practice.
- A series of proposals for the improvement of marketing of new technologies at Gdańsk University of Technology have been formulated. They cover such areas as market and client analysis, recognition of legal environment, preparing a business offer based on the results of development work or building long-lasting relations with clients.
- A condition for the efficiency of facilitating the marketing of new technologies is raising the status of commercial implementation in the assessment of R&D employees and creating incentives to cooperation for companies and universities and real consideration of the risk associated with innovative ventures.

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