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THE MARKETING OF RESEARCH AND DEVELOPMENT AT THE UNIVERSITY

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Abstract

Innovation is the main microeconomic motive for economic development. In the course of innovation, research plays an important role at several stages. Almost 75% of the research units belongs to higher education; therefore the extent to which the R&D activity at the university can reach the business sphere and to improve its competitiveness is very important.

For successful performance on the market it is necessary to develop a suitable business philosophy and organise activities according to this 'guideline' in the case of knowledge production, too. In the R&D at the university, asserting the marketing philosophy and acquiring the skills of marketing management is the right way to improve considerably the competitiveness of innovations at the university and increase economic returns. In this article the current R&D marketing approach of TUB is discussed and a possible marketing mix is also presented.

Keywords: innovation, basic research, applied research, experimental development, customer- orientation, marketing mix.

1. Attributes of Marketing R&D at the University

In contrast with the so-called linear concepts of innovation, which maps innovation as a chain of isolated activities, the modern approach to innovation depicts all the elements of the process in close interaction with the market opportunities.

Environmental changes concerning innovation force us to take into account the market considerations and develop the pillars of marketing-oriented behaviour of the companies in the field of university R&D as well. This concerns customer-orientation, profitable operation and building partnerships in the long run.

1.1. Customer Orientation of University R&D

In the case of university R&D, customer orientation means the placing of business utilisation of the 'knowledge product' in the foreground. Customer orientation can be examined both from the 'input' and the 'output' side. The input side of R&D requires the proximity of R&D including determination of the directions of research and users' demands (an increase in the weight of competitive applied

research and development can help companies with problem solving). Output side of R&D concerns the lengthening and expanding of the innovation chain at the university to market the results of innovation.

1.1.1. Factors Influencing Market Orientation of the Research Units

In general, the main factor of motivation for university R&D is the researchers' ambitions and the knowledge they have acquired. Accordingly, we can outline factors along which market orientation and the company relations of the research units show considerable differences.

Structure of education. Departments teaching many basic subjects are necessarily farther from industry, instead they are 'discipline-oriented'. In their R&D activity, applied research has a low profile.

Intensity of market challenge. Prospects of the 'knowledge product' on the market are limited by the characteristics and the changes of user areas. Some traditional research markets have collapsed, whereas new dynamic areas represent a serious challenge to university research.

Market knowledge, competitive advantages. Even if demand is constrained, with the help of R&D marketing research it is possible to find market niches, where the results can be marketed in a competitive way. Beside foreign firms with large R&D capacities, being up-to-date and adapting to the special expectations of users can be competitive advantage. Exploring the demands of the market may help new use of the R&D capacity and diversification of innovation activities.

Attitude of researchers to adaptation. Inspiration of market challenge can only be effective if researchers are adaptive, willing to and capable of change, and if they determine the directions of their research in accordance with the problems raised by companies.

The atmosphere in the departments is sensitive to industrial challenges. Within R&D at the university, we can distinguish the traditional 'ivory tower' attitude, which despises applied research and the attitude that is practice oriented. The latter can be greatly helped by integrating industrial experts into the departments because this process supports the mixing of academic and industrial attitudes.

1.1.2. Enforcing Market Considerations in the Utilisation of R&D Results

R&D results at the University are utilised in a non-profit way and/or sold on the market.

Non-profit utilisation. The non-profit utilisation of R&D results do not mean direct links with the market but benefits are very important from the point of view of developing marketing orientation of R&D:

- Presentation of scientific results in publications and at conferences is a very important factor in expanding the market for R&D.
- Undergraduate education and PhD courses that attempt to bridge the industry's labour demands may play a strategic role in building partnership between the University and the companies.

Sale on market. It is generally true for university R&D that the process of innovation gets interrupted at the phase of experimental development and does not get as far as utilisation in practice. Researchers do not obtain information about the practical use of R&D results, so they do not have their share from its proceeds, either.

Universities do not have the necessary experience in business-making and contracting so that they can assert their interests. As a result of transitional changes in the Hungarian society, many research institutes close to industry terminated its activity, others eroded. Universities, however, were not prepared to build relationships with industry among the altered economic and business conditions. Similarly to the business sphere, some changes are necessary in university research as well: to enter the market as a competent partner, and to learn the techniques of the assertion of interests first of all.

1.2. Long-term Orientation and Relationship Marketing in R&D

As a result of changes in the institutional system, their effects on the business sector and the change of researcher generations, the traditional company relations of the University have considerably shrunk.

The enforcement of customer orientation makes it necessary to rebuild the system of contacts with companies in two directions:

- broadening the range of contacts towards new areas and their market players,
- changing the characteristics of relations, transforming traditional industrial contacts into strategic cooperation.

Broadening the range of contacts. Broadening the range of relations means not only opening towards new market players, but also loosening the 'traditional industrial orientation' of TUB researches and moving towards the service sector, which – apart from telecommunication – is considered a yet unexplored market for university innovations.

Building strategic cooperation. Partnership marketing in university R&D means the interactive contact based on mutual advantages: research units produce innovative knowledge and companies make use of the new knowledge. In this case, the relationship between the company and the university is characterised not only by result orientation (access to and marketing of the 'knowledge product') but also by process and result orientation, along which it is possible to create long-term, strategic cooperation.

Interactive relationship of universities and companies carrying mutual advantages can be described as follows:

- With their ideas, researchers may give inspiration to companies in the introduction of new results while relation with the companies receiving R&D results becomes a major driving force of knowledge development.
- The experience learned through industrial relationships may raise further problems and, along with them, new basic research ideas.

- Integrating education and research is the token of building long-term relationships as graduates who are trained according to practical demands may strengthen the interest of companies in building strategic relationships, and enhance their readiness to adapt R&D.
- In strategic relationships confidence of the partners and continuity of the relationships may be regarded as a benefit.
- In the case of cooperative research, the mutual advantages may be expanded to several parties. Thus strategic relationships may evolve along the cooperation of the manufacturer, the user and the researchers.
- By extending cooperation to new fields, traditional partner relationships may also be deepened and made into strategic cooperation.

1.2.1. Relationships with Domestic Companies

Broadening the relationships with domestic companies and organising them along strategic lines are impeded by several factors, especially at small and medium-sized companies.

Differences in the structure of demand and supply of the 'knowledge product'. Nowadays, Hungarian companies still have demand for research results that produce rapid returns, and provide an instant solution to the given problem, and they are not willing to sponsor the (basic) research of deeper analysis. As a contrast, supply side of the 'knowledge product' is dominated by long-term basic research and research fields not directly connected to the interests of companies (e.g. environment protection and security).

Insufficient development of corporate R&D infrastructure. It often means a serious obstacle in the way of spreading inventions on a large scale that it is impossible to find partners within Hungary who have the needed background of infrastructure and technology.

Lack of industrial culture suitable for building strategic relationships. An indispensable external condition of putting R&D at the University on marketing basis is a corporate attitude that is free from short-term sales expectations, susceptible to receive the results of R&D, and oriented towards building strategic partnerships. Nowadays, Hungarian companies are generally not cultured enough in their attitudes towards the 'knowledge production' of universities; the behaviour of companies to build long-term relationships has few precedents and traditions.

1.2.2. Marketing R&D to Foreign Companies

Prospects of building strategic relationships with foreign companies are limited by their R&D policy.

Establishment of mutually advantageous long-term co-operation is possible only if the strategy of the foreign firm is aimed at creating think-tanks and R&D centres in Eastern Europe as well. If this attitude is missing, the employment of R&D units is motivated by low prices and the 'elimination' of risks inherent in R&D. At the same time researchers have no share from the exploitation, and (quite

often) no information concerning the 'career' of the R&D result on the international market.

Adapting the directions of research at the University to areas considered strategic by multinational companies is also very important.

Strategic cooperation of University research units and foreign companies can be in connection with either the industrial or the non-profit use of R&D.

While the strategic cooperation with Ericsson is based on the mass education of postgraduate students, Knorr-Bremse has brought strategic development to Hungary through the Faculty of Transportation.

1.2.3. Building Connections with Other Universities and Research Sites

In the cooperation networks within Hungarian higher education, complementary elements of knowledge and personal relationships play a very important role. However, the main motive of joint researches is still the force to apply for grant money. The area of research often makes it necessary to take part in international cooperation. However, if you want to increase competitiveness, determining the directions of research should also be accompanied by the consideration of opportunities to take part in joint research projects in other areas. Importance of international researches is on the rise in the course of globalisation.

1.2.4. Factors That Help to Build Relations

The interest of industry towards R&D at the University has increased considerably in the past few years. More favourable reception of 'knowledge product' in the market is influenced by several factors:

- In foreign companies with adequate capital, the strategy is more clear-cut: the first few critical phases of research activity are placed at external research sites. The ambition of companies to build a network of research units may increase the market opportunities of university R&D.
- Because of the accelerated technological changes and shortening product life cycles the management of risk of product development and backing development on a scientific basis are more and more important.
- Due to the increasing competition and the constraint to meet the demands of external markets, the susceptibility of Hungarian companies to R&D results is increasing.
- As a result of government efforts to support small and medium-sized companies, the SMEs may also appear on the market of R&D. To achieve this, though, it is necessary to develop the forms of organisation of joint actions.

1.3. Organisational Integration and Coordination

Setting R&D on marketing basis may be done along a two-level hierarchy: one is the 'market friendly' management of R&D at university level, the other is represented by the marketing functions organised diversely in the supportive environment of the former.

1.3.1. University Management for Marketing Purposes

At university level, the efficiency of R&D management can be measured by the extent to which it can promote the replacement of the contacts (mainly being 'ad hoc' in nature and based on personal relationships) with the building of systematic contacts and relations.

A few thoughts about this:

- The key issue of managing R&D efficiently is the organised and continuous flow of R&D information between the university management, the researchers and the companies. To achieve this, you need a global approach to knowledge management and to the development of a common basis for knowledge. Efficient allocation of information is equally important for the internal system of R&D relations and for presentation of R&D results towards companies.
- At university management level, companies with sufficient capital should be motivated to sponsor the university as a sign of their appreciation of university R&D, and to determine the key areas to which concrete tasks of R&D may be connected.
- The University should enter the market as a self-confident partner, making its partners aware of the fact that 'knowledge production' is a mutual, long-term interest.

Contact between Departments and Research Centres

Cooperation between departments and research units influences several stages of university R&D:

- Universities concentrate the highly educated experts of very different disciplines, which is an advantage in the competition in the R&D market.
- The increasing interdisciplinary character of research makes it necessary for the different sciences and disciplines to cooperate, thus emphasising the importance of relationships between departments.
- The university research units strengthen the bargaining position of the University in the competition for R&D contracts.

The different departments are also rivals in the battle for gaining good positions on the R&D market, so 'forcing' organisational links on them 'from above' may bring about serious conflicts of interest. According to our experience, competitive initiatives on the market were built 'bottom up', influenced primarily by personal ambitions and interests.

1.3.3. The Role of Departments

At the university research units one can still experience some of the 'socialist industrial' attitude, which expects that companies bring the research topics and the market-based – marketing-oriented – mentality to the university. Setting R&D on marketing basis requires a shift from the 'wait and see' attitude towards proactive mentality, which takes the initiative in the contacts with the business sector.

Along with the 'natural' means of building market, such as publications, professional forums, etc., it is necessary to develop or strengthen marketing tools, mainly the external PR activity of the departments. Efficient use of knowledge at the departments requires the strengthening of market (economic) considerations but we must not forget that improvement of the overall Hungarian business culture is desirable.

2. Marketing-mix in University R&D

Marketing-mix means the set of marketing tools, and it contains all the elements that can satisfy customer demand.

The 'knowledge product'. The range of 'knowledge product' includes basic and applied research, experimental developments, as well as 'service products' like consultation and counselling, measuring, testing, and quality control.

In the case of basic research, customer orientation may be interpreted in the following way: companies should get as much information about the basic research at the university as possible, and the main directions of research should fit into the areas considered strategic by the companies.

In the case of applied research, customer orientation means the dominating role of industrial impulses at the start of the research and sensitivity to the problems raised by the users during the innovation process.

Experimental development represents that part of 'knowledge product' supply from the university, which stands the closest to the market. While in basic and applied research researchers are free to some extent, in the course of experimental development they should adapt to outlined expectations of the industrial companies. This adaptation process requires a different attitude from the researchers. Another special feature is that due to its equipment-intensive nature, the experimental development often avoids the 'chain of supply' provided by the University and finds places at external research sites, subcontractors or the customer itself.

Price. When the results of R&D are sold on the market, a bigger stress should be laid on creating the balance of price and quality and through this the improvement of the gains. This is difficult, because demand for innovation is highly price sensitive in the Hungarian companies. The Hungarian enterprises lack interest in high quality R&D, and moderate prices have dominant role in the establishment of relationships with foreign partners.

Place (sale policy). In the case of university R&D, the sales process is divided into two parts: (ii) purchase of R&D results by users (ii) and introduction of products – made on the basis of the research results – to the market. It is quite common that the process of innovation does not attain the second phase of sales.

During the sale of university R&D results, frequently the faculty member/researcher him or herself is the seller, who has to manage all stages of the selling process. This is often far from the mentality of researchers, who follow 'the idol of traditional exercising of science'. Moreover, most of the university researchers do not have

the practice to enforce their own interest. Therefore, it is an important task for the university management to help researches with the handling of sales contracts, etc.

People. Scarce capacity of researchers is one of the main obstacles to more efficient university R&D activities. Due to the decreasing number of faculty members and the increasing burdens of mass education, teachers-researchers are overloaded. As to the planning of research areas, the departments face great uncertainties. Average age of the staff is higher than desirable; due to the overwhelming brain-drain from the business sector, the replacement of researchers is not continuous. Still, the research topics are built onto one another, and there are many multi-phase or individual research projects that require a longer period of time.

Physical evidence. The most serious problem in the marketing of university R&D is linked with the purchase of assets. In the lack of the necessary instruments and obsolete laboratories, important elements of the innovation chain that are the closest to the market get out of the University. For the University management it is an urgent task to eliminate the anomalies that arise from regulations.

Promotion. In the marketing of university R&D, communication means the mediation of information towards the business sector at university level and in individual marketing actions. On the other hand the information flow within the University should help the establishment of links with the market. External communication of the University should be based on the creation and strengthening of the 'research university' image, rather than on 'spontaneous appearance'.

Process. Market-driven university R&D is process oriented not only result-oriented; performance is based on cooperative relations and on the realisation of mutual advantages. Feedback is direct and continuous, accompanying the whole innovation process.

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