

REASONS AND DIRECTIONS FOR MARKET REORIENTATION OF RESEARCH INSTITUTES IN POLAND

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Purpose: Regulations related to the activities of research institutes, the regulations specifying the criteria and procedure for awarding a scientific category to research institutes and the principles of financing science, as well as the economic policy of the European Union in terms of increasing innovation and reforming the R&D sphere force the need to restructure marketing in the research sector. The aim of this article is to present solutions used by research institutes in marketing communication, leading to the development of cooperation with various market participants.

Design/methodology/approach: This is a review article. For this purpose, a review of Polish and foreign literature was carried out to synthetically show the solutions currently used by research institutes. Additionally, to show the challenges facing the institutes, a few words were devoted to new technologies.

Findings: Offers of research institutes are specific and require the use of special solutions in marketing, and the new economic conditions, in which the research institutes currently operate, force them to introduce innovative solutions and implement new directions in the field of marketing activities. Research institutes should react and intensify marketing activities to strengthen their image and maintain the current one, as well as to acquire new markets for the offered products, including R&D projects results.

Originality/value: The review of available literature enables to draw conclusions of a general character which can be a sort of guidelines for the management of the research institutes. The efficiency state-of-the-art marketing tools differs as regards innovative solutions, so it seems to be useful to analyze different possibilities in this scope. As the Author of this article has been involved in marketing activities of the KOMAG Institute for several years, it is interesting to be acquainted with her first hand professional experience.

Keywords: marketing of research institutes, commercialization, dissemination of research results.

Category of the paper: Literature review.

1. Introduction

Research institutes as the state organizational entities were established to realize R&D projects aimed at implementation and use of the research results in practice (Niemczyk, 2014).

Under the current Research Institutes Act (Act on Research Institutes), research and development organizations were transformed into research institutes. The most important changes, introduced in the Research Institutes Act relate to the functioning of research institutes. Increasing the efficiency of research organizations in testing and implementation of the results by a comprehensive evaluation of their scientific and research and development activities every 4 years, which will allow selecting the most valuable organizations of the scientific and innovative activities, conducted at the highest level, is the main objective of the adopted solutions.

Regulations related to the activity of research institutes, provisions defining the criteria and procedure for awarding a scientific category to scientific organizations and the principles of financing the science, as well as the economic policy of the European Union in terms of increasing innovation and reforming the R&D sphere, require restructuring the marketing activities in the research sector. The aim of the article is to present solutions, used by the research institutes in marketing communication, leading to a development of cooperation with various market participants. Marketing communication (https://mfiles.pl/pl/index.php/Komunikacja_marketingowa) is the process of sending signals and information to the marketing environment through various sources, as well as the process of their collection by the company. Marketing communication is aimed at providing the most important information about the company activities and the market offer prepared by it. Its purpose is also to induce the feedback of recipients to the information sent by it. Any information coming from the market environment is important for the company to introduce changes to its offer, adapting it to the needs and requirements of current, but also future customers or business partners. In turn, sending appropriate stimuli to the market environment allows to change behaviour of customers, thus shaping the demand for the company's products. The activities, described above, should be realized in parallel and then, from the marketing communication point of view, some kind of a dialogue between the company and the recipients about products or services can be created. Marketing communication includes a flow of information among market entities using various communication channels to implement the marketing strategy adopted by the company.

The article reviews the literature in terms of identifying marketing goals of research institutes and specific marketing tools, effective as regards a research institute functionality, including the principles of parametric evaluation of scientific organizations. The literature analysis begins with an identification of barriers to innovation in the R&D sector. Then, the models of marketing activities, used by research institutes to disseminate innovative solutions and commercialization of R&D projects are described. At the end of the article, some directions of marketing activities and the current marketing trends are presented.

2. Literature review

An identification of barriers to innovation in the Polish economy was one of the goals of the studies conducted in the years 2014–2016. Studies of the Warsaw Management University showed that one of the key factors constructing these barriers is a low level of cooperation between business and science, which in turn results from structural problems being a matter of the state policy and the inability to communicate between representatives of business and science (Mikosik, 2018).

The problem of innovation is analyzed by Kaźmierczak (2011), who believes that the lack of effective links between business and the R&D sectors is the main barrier to the improvement of the innovation level. The reluctance of entrepreneurs to take a risk as regards an implementation of innovations is also an important barrier. The changes on the global market and a pressure on a commercialization of R&D results, increase competitiveness and force the implementation of marketing methods of managing, also in the case of research and development organizations. These organizations, treated as specific enterprises, offer research results on a commercial basis (Sojkin, 2014). The phenomenon of knowledge commercialization is currently observed in research institutes. The change in regulations, concerning scientific entities, forced them to develop new strategies based on a commercialization of research results and speeding up innovation processes to implement them in the industry. The commercialization subject of research and development work can be any product or service, generated at a scientific organization in the result of research: an innovation, an invention, a new technology or method (Flisiuk and Gołąbek, 2015), Figure 1.



Figure 1. Product categories of research institutes (Slotorsz and Cichoń, 2014).

Maślanka (2019) notes that the offer of research institutes is specific and requires an application of specific marketing solutions, and new economic conditions in which research institutes operate to stimulate an introduction of new solutions and use of new marketing trends. To apply the marketing concept in research institutes, their restructuring is required in the following three basic areas:

1. Market reorientation of a research institute.
2. Product restructuring in the scope of realized research and development projects.
3. Change in the sales of R&D products and services with use of marketing mix tools.

Sojkin (2014), in the case of a research institution, describes a group of market participants, who form a network of connections to create a value for customers as stakeholders. These include: present and future customers, national and international associations and industry corporations, local and central authorities, technology parks, research and scientific centres, universities, financial institutions and media. An adaptation of the product to individual parameters required by customers is the basic problem.

An introduction of marketing orientation, the use of which in R&D organizations contributes to building science-business relations, resulting in the transfer of knowledge to the economy (Slotorsz and Cichoń, 2014), is one of the elements influencing an increase of effectiveness in commercialization of the R&D project results. An adequate implementation of marketing orientation, on one hand, helps a research institute to disseminate information about its research and implementation projects, and on the other hand, to make potential entrepreneurs aware of the profits resulting from an implementation of specific R&D results. Walasik (2018) describes the methods of implementing the marketing orientation in a research and development organization in the result of using the defined hybrid and dedicated models, depending on the instrumentation model, as a part of the 4P marketing-mix concept, the use of which translates into an increase of the success rate as regards a commercialization of R&D results. A set of 5 hybrid models within a marketing-oriented research organization is described. They are as follows: the innovation model, the niche model, the sub-supply model, the comprehensive model and the market model. Each of the five models was verified in terms of the possibility of its use depending on three key input parameters: the type of solution, the nature of the solution and the commercialization mechanism. For each combination, containing the type of the solution (5 options), the nature of the solution (3 options) and the commercialization mechanism (4 options), dependency matrices were created, the analysis of which determined the selection of adequate hybrid models. The developed hybrid models were verified on several dozen examples of commercialized R&D results and are used in relation to the results of scientific research, development work, research and implementation projects, etc. developed at a research institute.

In another project, Walasik (2014) presents good practices in the field developed and implemented at the Institute for Sustainable Technologies – National Research Institute (ITeE – PIB), examples of using the dissemination system as an essential component of the process of managing innovative technological products. The dissemination includes all the activities aimed at attracting relevant people, enterprises or institutions to the results of R&D work, presenting the possibilities of their use and the benefits of their application in the economy. The dissemination requires identifying the target market, formulating the right message for a given market segment, selecting the most effective ways to reach the groups of potential

recipients identified in the segmentation process, or an effective implementation of the intended marketing activities. Their product portfolio consists of innovative technological solutions that require an innovation not only in terms of technique and technology, but also an efficient and effective marketing model using state-of-the-art sales techniques on strictly defined target markets.

The key success factors for the process of developing a new product or improving an existing one and introducing it to the market, referred to in the literature as NPD (new product development), are as follows: technology (added value of technology, cost reduction achieved due to the use of technology), marketing (meeting the needs of customers, production time, profit, market share), NPD management and the commercialization process, i.e. the stage of introducing a new product to the market (profit increased by possible additional investments made in the result of the product commercialization). Among them, the most important is NPD management, which consists of four main processes:

- creating and implementing the product that meets the market demand,
- adjusting the business model to the structures and rules of the market, taking into account target segments,
- adjusting marketing activities to the rules and principles of competing on a given market,
- activities strengthening the market position of entities.

Figure 2 shows the system of disseminating the innovative solutions dedicated to a research and development organization, consisting of five main elements, i.e. market analysis, segmentation process, development of marketing strategy, organization of dissemination activities, follow-up phase.

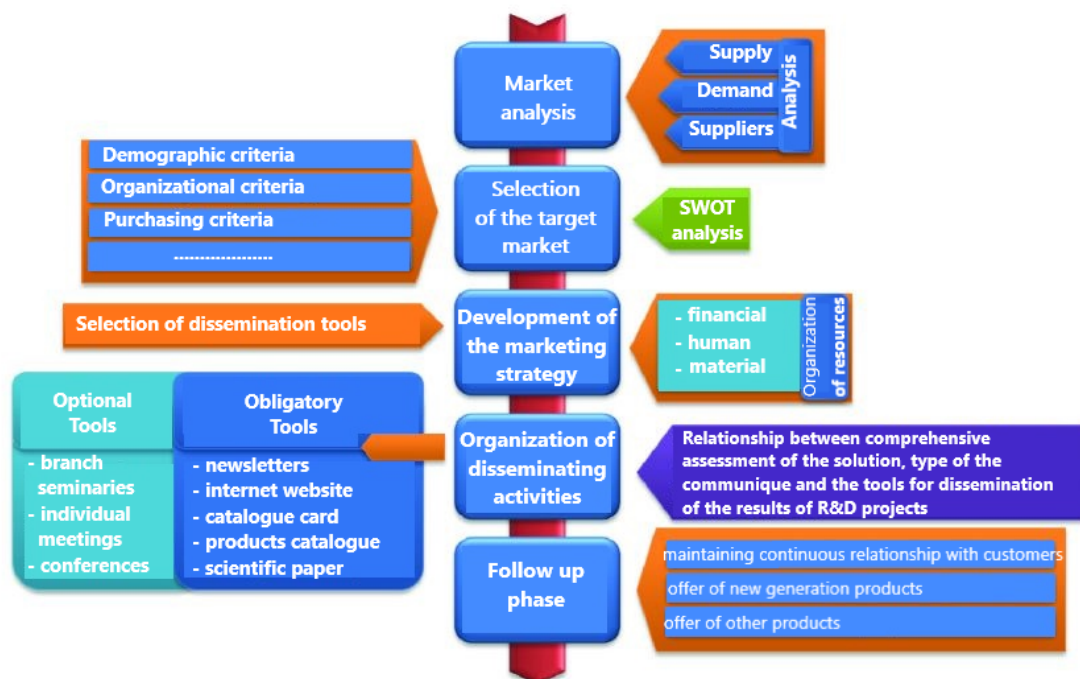


Figure 2. System stages of disseminating the results of R&D work in the economy (Walasik, 2014).

The paper (Niemczyk, 2014) shows that multi-channel reaching the specific groups of business customers with appropriate information, which is the essence of marketing communication, including the following activities:

- communicating all the company's values to the market environment through marketing activities,
- a communication inside the company,
- shaping the company's identity, i.e. distinguishing features,
- a partner-oriented reaction to information coming from the environment.

Such an approach is the result of conscious management of products developed bearing the commercialization in mind.

According to Sojkin (2014), a today's product requires not only innovation in the field of technique and technology, but also an efficient and effective model of market communication or sales techniques in strictly defined segments, and above all, an innovation in planning its full life cycle (innovative and market). Adjusting marketing activities to the rules and principles of competition (focus on developing a competitive position), which in today's economy is one of the basic conditions enabling functioning of each economic entity and determining its competitive position. A development and implementation of the marketing strategy, based on the market segmentation and understanding the needs and requirements of consumers is an important element in this process. It is advisable to undertake both: image-building activities, which are primarily aimed at strengthening the brand of a research institute in the national and international area, promoting new products at national and international conferences and symposia, and by publishing scientific articles, as well as undertaking individual marketing activities. The last area of NPD management – carrying out activities strengthening the market position of a research and development organization – is possible by monitoring the level of customer satisfaction. It is also important to inform customers about the work on creating new generations of a given type of product. The system of tools for dissemination shows Figure 3.

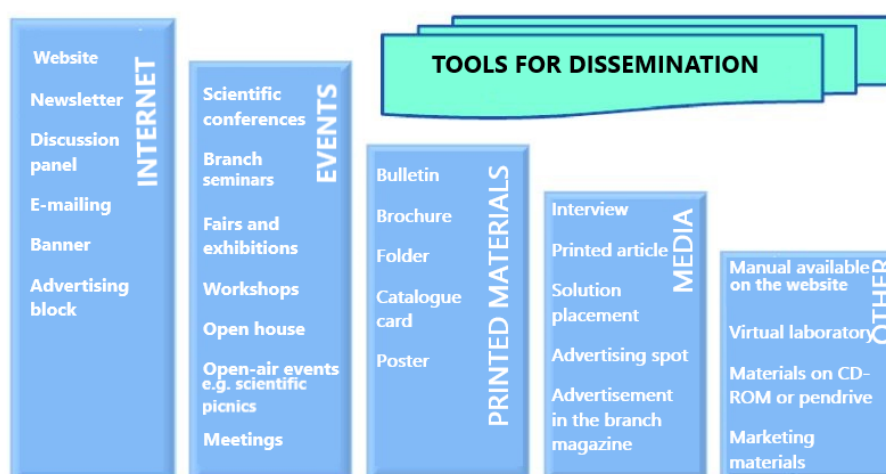


Figure 3. Main tools for dissemination of R&D results (Walasik, 2014).

The purpose of dissemination is:

- Building a positive image of the research organization.
- Reaching individual target groups with a clear and understandable message about the product.

In addition, present market challenges, related to global trends and local changes in the behaviour of market participants, force marketing activity consisting in use of a constantly developing range of marketing tools for the market participants to search for new strategic solutions on the supply and demand side (Sojkin, 2014).

A preparation of a set of market values that constitute clearly and precisely defined goals of the organization activity on the market, based on the knowledge and experience in various areas of activity is a start of the way leading to a creation of the aforementioned resources. They will be used for a preparation of the company's strategy (including the marketing strategy), which will allow for their implementation adequately to the needs and expectations of customers and the shaped market mechanism. The scale of implementation and ultimately an achievement of the values is not easy in the light of previously indicated globalization processes, a dynamic development of information technology as well as changeability and complexity of market conditions, relations between market stakeholders/participants and repeating crises on micro and macro scales. Hence the enormous challenges, faced by the participants of each product market, in particular the service market, who want to effectively and efficiently implement the marketing strategy, and especially the requirements and expectations in this regard, are addressed to market participants of scientific and research organizations. As a consequence, market values related to the implemented innovation and re-innovation processes, require a non-standard approach due to a desire of satisfying new, often unknown customer's needs, which must be very precisely described, their utilitarianism must be indicated and explained in a comprehensive manner (misunderstandings around CO₂, GMO or nanotechnology); and often it is required to intensively educate a target market participant to create new dimensions of needs as well as forms and techniques of their access and use. This usually needs a different approach to the marketing of a scientific-research institution, which usually adopted the traditional 4P or 4C toolkit as a starting point and focused mainly on recognizing the shaped infrastructure of the target market, using effective and efficient marketing instruments and creating new market/marketing relationships among stakeholders of innovative processes. The current canons of the market operating mechanism, in the vast majority of markets, mainly due to changes in the infrastructure on the supply side as well as the tools and forms of communication of its participants, and above all, revolutionary changes in the needs and expectations of consumers/customers/buyers, force a change in the approach to defining the marketing instruments of scientific and research organizations.

Public relations are treated by PR practitioners as a separate field, as opposed to marketing specialists who consider it a tool helping to achieve marketing goals (including publicity). An influence on such a perception of public relations is attributed to its location in the mix

marketing by the marketing "prophet" Philip Kotler. Despite this, Kotler in the 1990s stated that PR is a separate field of science, but still many academics believe that it has a marketing function.

Marketing public relations are defined as "the process of planning, implementing and evaluating programmes that encourage purchase and contribute to a customer's satisfaction by credible communicating information and perceptions, identifying companies and their products with the needs and interests of buyers" (Harris, 1998). Relations between marketing and public relations are shown in Figure 4.

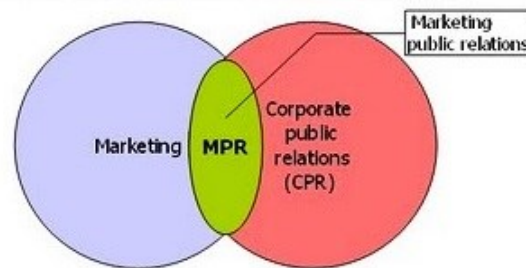


Figure 4. Relations between marketing and public relations (Szymańska, 2004).

The main tasks of marketing public relations (MPR) are the following ones (Olędzki and Tworzydło, 2008):

- building awareness of the existence of products or services,
- sales stimulation,
- building relationships and facilitating dialogue between consumers and brands,
- image creation,
- providing information on products and services,
- CSR activities.

Marketing constantly follows new trends which, in the light of theoretical knowledge, are often not well described or categorized yet. Recalling the most characteristic trends of recent years, some trends of current marketing such as content marketing, digital marketing, social media marketing, buzz marketing - closely related to the development of new internet marketing technology and tools can be mentioned. An integration should take place not only at the level of the promotion mix tools themselves, but also the mix marketing as well as at the strategic level (such as the vision, mission, main strategic assumptions of the company). Therefore, it is necessary to study marketing communication in terms of the operation of the entire organization, which leads to an adoption of the concept of integrated marketing communication (Pluta-Olearnik, 2018).

The concept of Integrated Marketing Communication (IMC) combines a variety of marketing tools to ensure transparency, consistency and maximize the communication impact (Figure 5). This, in principle, two-sided, controlled flow of information between the organization and its contractors allows for the creation of a coherent context of the transmitted messages, which affects the image and effective positioning of the brand. The selection of

appropriate IMC tools depends not only on the target audience, but also varies in different phases of the product or service life cycle (Jarosławska-Sobór and Dulewski, 2014).

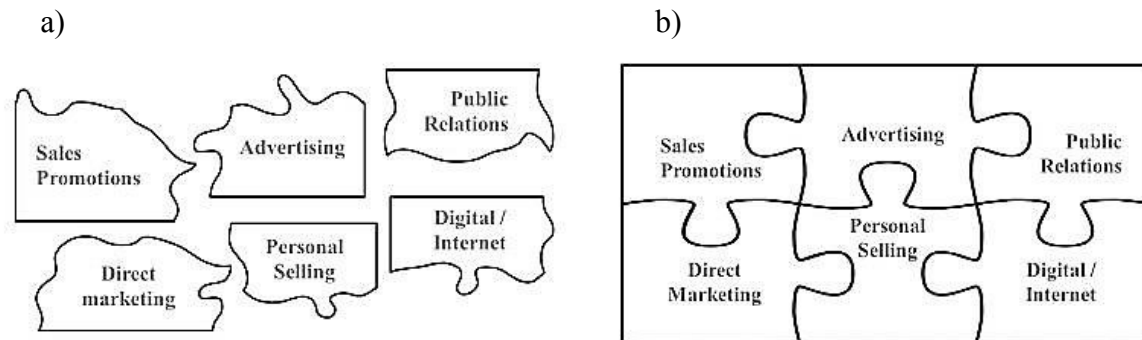


Figure 5. a) Typically disintegrated approach to the marketing communication; b) Integrated approach to the marketing communication (Key and Czaplewski, 2017).

According to Niemczyk (2014), the task of integrated marketing communication is to establish and maintain partner relations with various market participants. It must reflect the culture and style of the company by conveying the characteristics and values that have been adopted as specific to the company. Integrated marketing communication requires an implementation of the activities such as:

- the market surveillance and getting information needed to prepare an offer,
- a preparation and an implementation of a promotional plan (defining the promotion target, addressees, budget, executors, evaluation of the promotion),
- a selection of forms and means with use of synergy effects,
- a preparation of promotional messages in the way of:
 - minimizing the gap between the promise contained in the message and the value obtained in the product,
 - enabling an implementation of the communication and sales effect,
 - maintaining the consistency of the message due to the content, source and time,
- linking promotional activities with other elements of mix marketing,
- a coordination of all the activities by the person responsible for the company's marketing communication.

At the Institute of Logistics and Warehousing, e-marketing, which is a part of integrated marketing communication, is mainly carried out through websites, internet portals, social media, and e-mail newsletters. On the other hand, analytical and research tools in the marketing of scientific and research organizations, such as Google Analytics, SeoStat, Salesmanago, an advertising equivalent and a series of reports, are used to test the effectiveness and efficiency of marketing communication.

A skilful use and a combination of brand communication strategy and advertising activities increase the chances of reaching the customers/recipients.

360 Degree Marketing is another type of integrated marketing and it is nothing more than integrated activities based on a holistic advertising strategy. Its assumptions say that all the promotion channels are consistent and they must also be integrated with one another to effectively affect the recipient. The nomenclature is not accidental, it speaks of the entirety and unity of the carried out activities. Monitoring and evaluation of the undertaken activities are extremely important elements of such a strategy. This type of marketing is only effective, when the progressivity of the channels, not only in general, but also individually is analysed systematically. 360 Degree Marketing also means a comprehensive understanding of the brand, an awareness of its goals and mission, and then selecting the right tools and target group to achieve these goals (<https://virtualpeople.pl/blog/10-Marketing-360-czym-wlasciwie-jest>).

A recent study by Robinson (2017) shows how young people are involved in multi-task activities in media, so campaigns need to convey a coherent narrative across different media. To achieve this, a higher level of cooperation is needed among all the agencies involved in marketing campaigns for the company.

Jarosławska-Sobór et al. (2019) present the issues of Marketing Automation (MA) and the possibilities of using its tools in the operational activities of research and scientific organizations. MA is one of the most important trends in current marketing, which is a real challenge, when it comes to using it to build a competitive advantage. MA is a state-of-the-art, advanced technological solution aimed at streamlining marketing processes and a wider use of market and customer data. In everyday practice, it means all the activities in the field of automation of communication processes with potential and current customers. It has been assumed that MA is a technology that allows to automate and measure marketing tasks and workflow so as to be able to increase operational efficiency and accelerate revenue growth. Properly formulated content is delivered to potential customers and business partners via a pop-up banners, e-mails or social media redirection at the most appropriate moment. By using the tracking system on the website, the campaigns targeted at the potential business partners can be addressed. MA enables to run campaigns in all the channels at the same time, assuming that they are online channels. The article presents a case study of the GIG (Central Mining Institute), which started its implementation work by designing a completely new website. Its architecture is to provide users with comprehensive information about the offer. The preparation of a special JavaScript code and its implementation in the structure of the www.gig.eu website allowed the Institute's marketing departments to better understand the needs of potential customers and match them with the appropriate commercial offers. Registration forms that enable transferring the key data, such as an e-mail address, marketing consent and interest in a specific field of science, have been prepared. After signing up via the form, the customer goes to the contact manager and becomes a monitored contact. On this basis, the history of the activity of each customer, browsing the Institute's website, is created.

The Integrated Marketing is another type of marketing activity, which is nothing more than a collection of all the possible Internet advertising activities as shown in Figure 6. All the activities and channels, used in this type of marketing mainly have two purposes (<https://poradnikprzedsiębiorcy.pl/-marketing-zintegrowany-wszystko-co-nalezy-o-nim-wiedziec>):

- increasing traffic on the landing pages,
- brand promotion and branding.

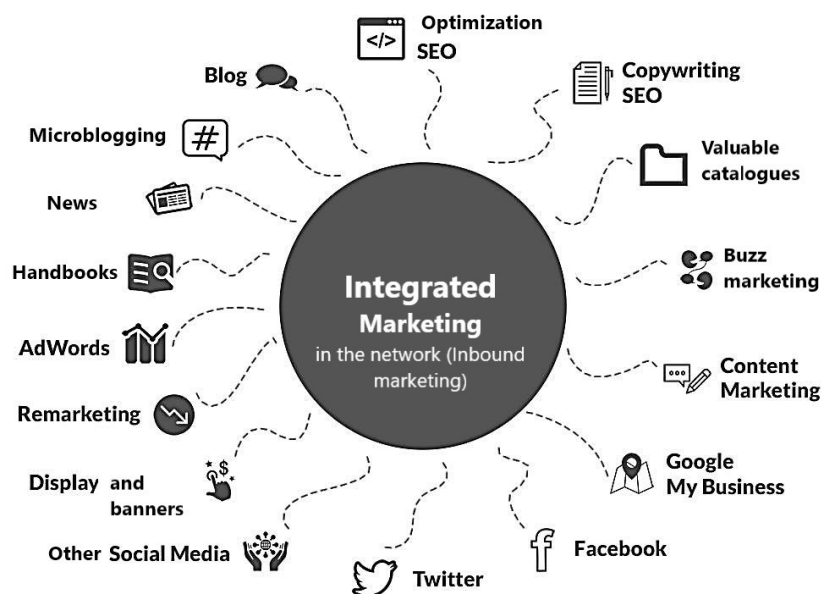


Figure 6. Marketing activities creating the integrated marketing (<https://marketingmind.pl/co-to-jest-marketing-zintegrowany/>).

Social Media are very important for the integrated marketing on the web, as they attract customers and attract their interest. The contents in social media should engage the audience and convey important and attractive information. Marketing integrated on the web, due to a synchronization of several means of communication, increases the chances of popularizing the content, which in turn allows to achieve a better sales effect. This type of marketing tries to surround the customer on all sides and put him at the centre of the activities. Integrated marketing on the web consists in coordinating actions that are to increase the final effect. It combines the possibilities offered by websites, Search Engine Optimization (SEO), social media, blogs, Search Engine Marketing SEM (sponsored links) or e-mail marketing. Consumers look for information about products on the Internet, that is why SEM is so important as regards helping customers to find the right page and make them become interested in its content. Positioning in search engines and the content must interest customers.

Marketing on social networks, better known as Social Media Marketing, has become an integral part of the business of the 21st century organizations. However, the literature in this area remains fragmented and focuses on single issues (Jurado et al. 2018).

Keller (2016) argues that the future of advertising and marketing communication will be determined by an increasingly diverse set of new digital options added to traditional media and communication options already available to marketers. By leveraging the unique strengths of different communication options and by combining and sequencing them strategically, marketers have the ability to drive sales and build brands in the ways that were never possible before. But such an approach will require new concepts, new tools and a new mindset.

Virtual reality is one of the new tools, described by Krasnov (2018) in his work that can be used by marketers. It is one of the technologies that can make a big difference in our lives in the next few years, so it is very important that we understand what it really is and what it can do now and in the future. Lack of content is the problem which the virtual reality can face. Since the number of users is still small, few people create content for the devices. There are already many platforms for content, but there are no unified standards yet. Virtual reality can create a new marketing platform that has yet to be discovered by many companies. VR allows creating more interesting content for receivers and gives them a more realistic experience than regular films or apps. Technology tricks the mind into thinking that you are somewhere else. Devices for receiving virtual reality can use both computers and mobile devices. Virtual reality is used by research institutes to support the process of servicing the mining machines and training the machine users at work stations (Winkler et al., 2010, 2013).

Virtual reality can be used to promote products and services in a completely unique way or to promote events. In the case of an institute for which the problem is to present its products (at least due to their dimensions) at fairs, the easiest way to benefit from virtual reality is to create good-quality content that can be presented at many events, as well as commissioning the production and renting a virtual reality headset with instructors for the fair. In the era of live streaming and 5G network, people will increasingly use Internet communication instead of travelling, and virtual reality will give the opportunity to be around the world staying at office or at home. Ads for those who use a VR headset are an effective way to get the message across. The persons using the VR headset are fully immersed in the content which they can see through the VR headset. The people, who have tried the VR solutions know that when using the VR goggles, it is almost impossible to do other tasks apart from focusing on the content as the view is blocked and the audio content must be listened to. This means that the user is less likely to be distracted during listening the broadcasted content, compared to the modern world, where distractions are everywhere. Virtual reality advertising continues to be marginally used, and YouTube is one of the few platforms that have made it possible. Virtual reality has the potential to really change the game, when it comes to marketing. While social media and digital marketing gain popularity, some companies try to come up with new ways to attract an audience, and virtual reality is one of the best ways to do so. Using VR, as a part of the marketing portfolio, is not an easy task as it requires a lot of effort, time and money. However, virtual reality has overcome the hype phase and it is in line with the Gartner hype cycle for new technologies (Figure 7). It is well on its way to becoming a mainstream product.

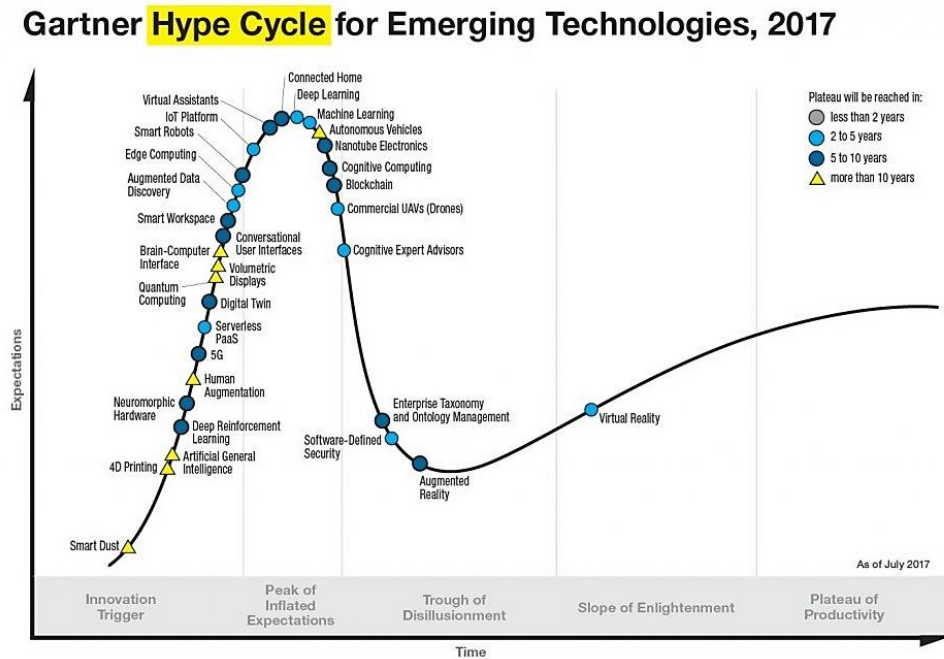


Figure 7. Gartner advertising cycle concerning emerging technologies (<https://www.gartner.com/smarterwithgartner/top-trends-in-the-gartner-hype-cycle-for-emerging-technologies-2017/>).

According to the specialists from gartner.com, it should take from 2 to 5 years before virtual reality reaches the so-called "productivity plateau". The term "productivity plateau" means that an adoption to the mainstream is beginning to develop.

3. Conclusions

Offers of research institutes are specific and require the use of special solutions in marketing, and the new economic conditions, in which the research institutes currently operate, force them to introduce innovative solutions and implement new directions in the field of marketing activities. Research institutes should react and intensify marketing activities to strengthen their image and maintain the current one, as well as to acquire new markets for the offered products, including R&D projects results.

The marketing tools, which will work well for the sales of certain products or services, will not necessarily be applicable to other products. One of the ways is to get interested in the entrepreneur's innovation from the very beginning and to consider submitting a joint project within a scientific and industrial consortium. This solution guarantees that after the successful completion of the project, the developed innovation will be directly implemented by the industrial partner. The European Union, the main founder of research projects, places emphasis on cooperation between science and business, so in EU competitions, often the participation of a research organization and enterprise is

the condition for establishing a consortium. One example of such a solution, used in a research institute is described by Malec and Stańczak, 2020.

The activities of research institutes are also financed by subsidies and their own revenues. In the light of the introduced regulations regarding institutes, which are aimed at increasing the effectiveness of research and implementation activities of the research organizations by a comprehensive evaluation of scientific, research and development activities once every 4 years as well as a selection of appropriate tools seems to be extremely important to compete on domestic and international markets. It seems necessary to create a model of integrated marketing using the state-of-the-art technologies. The use of virtual reality in marketing activities seems to be an obligation, especially in a pandemic situation and impossibility of using traditional marketing tools.

References

1. *Co to jest marketing zintegrowany*. Available online <https://marketingmind.pl/co-to-jest-marketing-zintegrowany/>, 29.11.2020.
2. Flisiuk, B., & Gołębek, A. (2015). Możliwości komercjalizacji wyników badań naukowych w instytutach badawczych-modele, procedury, bariery oraz dobre praktyki. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*, 77, 63-73.
3. Harris, T.L. (1998). *Value-added public relations: the secret weapon of integrated marketing*. NTC Business Books.
4. Jarosławska-Sobór, S., & Dulewski, M. (2018). Wykorzystanie zintegrowanej komunikacji marketingowej we wprowadzaniu na rynek nowej marki. Case study Eko Patrolu Głównego Instytutu Górnictwa. *Marketing Instytucji Naukowych i Badawczych*, 4(30), 57-74.
5. Jarosławska-Sobór, S., Dulewski, M., & Wasilewski, F. (2019). Marketing Automation w jednostce badawczej-realna wartość czy mrzonka skuteczności. *Marketing Instytucji Naukowych i Badawczych*, 4(34), 21-42.
6. Jurado, D.B., Morales, D.S., Analuisa, F.L., & Hernández, S.V. (2018). Marketing estratégico en redes sociales de las organizaciones. Un abordaje 360°. *Revista Científica Ciencia y tecnología*, 18(17).
7. Kaźmierczak J., (2011). Inżynieria innowacji: techniczny wymiar wdrażania innowacyjnych rozwiązań w gospodarce. In: R. Kosala (ed.), *Komputerowo zintegrowane zarządzanie, t. 1* (pp. 463-472). Opole: Oficyna Wydawnicza Polskiego Towarzystwa Zarządzania Produkcją.
8. Keller, K.L. (2016). Unlocking the power of integrated marketing communications: How integrated is your IMC program? *Journal of Advertising*, 45(3), 286-301.

9. Key, T.M., & Czaplewski, A.J. (2017). Upstream social marketing strategy: An integrated marketing communications approach. *Business Horizons*, 60(3), 325-333.
10. *Komunikacja marketingowa*. Available online https://mfiles.pl/pl/index.php/Komunikacja_marketingowa, 4.12.2020.
11. Krasnov, M. (2018). *Using Virtual Reality and 360-degree Photos and Videos in Marketing*.
12. Malec, M., & Stańczak, L. (2020). A Generation of Innovative Technical Ideas and Solutions as an Important Component of the KOMAG Strategy. *Multidisciplinary Aspects of Production Engineering*, 3(1), 248-262.
13. *Marketing 360 czym właściwie jest*. Available online <https://virtualpeople.pl/blog/10-Marketing-360-czym-wlasciwie-jest>, 5.12.2020.
14. *Marketing zintegrowany*. Available online <https://poradnikprzedsiębiorcy.pl/-marketing-zintegrowany-wszystko-co-nalezy-o-nim-wiedziec>, 29.11.2020.
15. Maślanka, M.E. (2019). Uwarunkowania i kierunki działań marketingowych w polskich instytutach badawczych. *Marketing Instytucji Naukowych i Badawczych*, 1(31), 1-20.
16. Mikosik, P. (2018). Problemy współpracy nauki i biznesu. *Marketing Instytucji Naukowych i Badawczych*, 2(28), 99-120.
17. Niemczyk, A. (2014). Rozwój współpracy instytutu badawczego z przedsiębiorstwami w kontekście komunikacji marketingowej. *Marketing i Rynek*, 3(CD), 331-354.
18. Olędzki, J., & Tworzydło, D. (Eds.) (2008). *Public relations: znaczenie społeczne i kierunki rozwoju*. PWN.
19. Pluta-Olearnik, M. (2018). Zintegrowana komunikacja marketingowa – koncepcje, praktyka, nowe wyzwania. *Marketing Instytucji Naukowych i Badawczych*, 2(28), 121-138.
20. Robinson, H.R. (2017). Towards an enhanced understanding of the behavioural phenomenon of multiple media use. *Journal of Marketing Management*, 33(9-10), 699-718.
21. Slotorsz, A., & Cichoń, W. (2014). Marketing instytutów badawczych w świetle obecnych uwarunkowań organizacyjno-prawnych. *Marketing i Rynek*, 3(CD), 409-429.
22. Sojkin, B. (2014). Informacyjne uwarunkowania marketingu instytucji naukowo-badawczej. *Marketing i Rynek*, 3(CD), 393-405.
23. Szymańska A. (2004). *Public relations w systemie zintegrowanej komunikacji marketingowej*, 367-377.
24. *Top trends in the Gartner Hype Cycle for emerging technologies 2017*. Available online <https://www.gartner.com/smarterwithgartner/top-trends-in-the-gartner-hype-cycle-for-emerging-technologies-2017/>, 9.12.2020.
25. Ustawa o instytutach badawczych – Dziennik Ustaw z 2010 r., nr 96, poz. 618
26. Walasik, M. (2014). System działań upowszechniania innowacyjnych rozwiązań technologicznych zaimplementowany w instytucie naukowo-badawczym. *Marketing i Rynek*, 3(CD), 433-452.

27. Walasik, M. (2018). Orientacja marketingowa jednostek naukowo-badawczych jako wsparcie procesu komercjalizacji wyników B+R. *Marketing Instytucji Naukowych i Badawczych*, 4(30), 75-89.
28. Winkler, T., Michalak, D., Jaszczyk, Ł., & Rozmus, M. (2010). *Use of Augmented Reality technology in life of technical means*.
29. Winkler, T., Tokarczyk, J., & Michalak, D. (2013). Virtual working environment. *Handbook of loss prevention engineering*, 1, 393-421.