THE ROLE OF PUBLIC RELATIONS MANAGEMENT IN THE DEVELOPMENT OF NONCONVENTIONAL RESOURCES AND TECHNOLOGIES

Claudiu Pîrnău[1], Liviu-Daniel Ghiculescu[2] and Cornel-Cristian Enciu[3]
[1]POLITEHNICA University of Bucharest, *Corresponding author,* ORCID No. 0009-0009-0074-3625, claudiu.pirnau@upb.ro
[2]POLITEHNICA University of Bucharest, ORCID No. 0000-0002-9923-2180, daniel.ghiculescu@upb.ro
[3]POLITEHNICA University of Bucharest, ORCID No. 0000-0001-8905-4571, cornel.enciu@upb.ro

ABSTRACT: At the beginning of this century, the attitude towards conventional and nonconventional public relations changed fundamentally. James K. Galbraith (from Harvard University), Nobel Prize laureate in Economics, characterized the phenomenon of complementing direct communication with feedback through the expression: "A person wants to be heard." In the current context, shaped by the development of Industry 4.0, the Internet of Things, and Artificial Intelligence, the human factor is being redefined, considering its importance in domains like economic, political, and spiritual development of society. The "partnership" model, adopted in numerous public relations and management events and organizations, has made a significant contribution to the process of identifying nonconventional resources and implementing/developing nonconventional technologies. The interactions between organizations and specialists, between education and industry, have enabled the creation of new connections that have led to the identification and implementation of the interests and needs of various groups, including those involved in the use of nonconventional resources and technologies.
KEYWORDS: nonconventional technologies, nonconventional resources, public relations, nonconventional public relations.

1. INTRODUCTION

At present, there are numerous definitions of public relations: according to a study conducted by an American professional organization in 1975, approximately 500 definitions of this concept were identified [1].

According to the economists A. N. Chumikov and M. P. Bocharov, “Public relations represent a system of informational-analytical and procedural-technological actions that involve the creation and dissemination of messages aimed at harmonizing relationships within a specific project or field, as well as between specialists and the external environment, for the successful implementation of that project as an integral part of a given domain”.

A very important contribution to public relations theory and practice was made by E. Bernays, the nephew of Z. Freud. He is listed as one of the top 100 most influential Americans of the 20th century [1].

This definition presents a significant aspect: without an understanding of public relations, effective communication between specialists and stakeholders cannot be realised.

This paper seeks to emphasize this phenomenon in the context of the importance of developing nonconventional technologies as the foundation of Industry 4.0. In the complex and competitive landscape of nonconventional technologies, where quality, reputation, and contractual relationships are essential, both conventional and nonconventional public relations play a very important role in shaping perceptions, building trust, and fostering the success of organizations operating in this field.

Public relations are essential in the process of building trust and credibility for all types of organizations, including those operating in the field of nonconventional technologies, as well as for stakeholders involved in the evolution of this cutting-edge domain.

By implementing communication plans in crisis situations, monitoring the media, and applying stakeholder engagement strategies, public relations specialists can anticipate and mitigate potential threats generated by economic crises in the external environment [2].

For example, through the opportunities provided by conferences, seminars, and workshops (with presented and published papers), public relations initiatives allow participants to share information, to offer expertise, and to have discussions on various topics of interest specific to the field of nonconventional technologies.

The International Conference on Nonconventional Technologies (ICNcT), organized annually, represents an example in this regard, starting from its specific topics and continuing with the papers presented (later published) and the discussions

(exchange of experience) among participants, as shown in table 1 [3].
In 2021, the conference name was adapted to post-pandemic conditions, also including areas such as Quality and Innovation Management: "Quality and Innovation & Nonconventional Technologies in the Post-Pandemic World", thereby benefiting from an expanded range of topics. At most conferences, on average, 50% of the authors participated, that is, approximately 55 people (table 1). Each conference also includes a meeting of the members of the Romanian Association for Nonconventional Technologies (RANT), an event during which, in addition to the exchange of scientific information, the main issues related to the Nonconventional Technologies Review-a journal specializing in nonconventional technologies, which also publishes papers presented at the ICNcT conferences are discussed.

Table 1. ICNcT Conferences (extract)

No.	Conference Name	No. of Papers	No. of Authors
1	ICNcT 2024	55	118
2	ICNcT 2023	47	105
3	QIEM-ICNcT 2021	87	257
4	ICNcT 2019	56	143
5	ICNcT 2018	37	80

Communication and the exchange of experience take place both among participants and through interactions with the external environment, by organizing visits to industrial organizations that primarily use nonconventional technologies or are involved in identifying and developing nonconventional resources.

The information and knowledge shared by conference participants may originate from sources such as:

- Competencies acquired through formal and informal education;
- Activities performed in industrial enterprises;
- Experience gained within research institutes;
- Individual study (specialized publications, Internet, Artificial Intelligence, etc.);
- Experience exchanges (Erasmus programs, international conferences, etc.).

In this paper, the importance of public relations in the development of nonconventional resources and technologies will be addressed across five chapters:

(1) Introduction
(2) The issue of biomass in public relations
(3) The fundamentals of development and use of nonconventional gases established in public relations at the political level
(4) Nonconventional public relations
(5) Conclusions

2. THE ISSUE OF BIOMASS ADDRESSED IN PUBLIC RELATIONS

Public relations represent an important element that contributes to shaping and influencing the activities specific to various industrial sectors, including those involved in the identification and valorisation of nonconventional resources, such as biomass or nonconventional gases. Bioenergy represents an innovative tool that can be utilized in the long term. Alongside other renewable energies - solar, water, and wind-combined with effective energy-saving measures, bioenergy can contribute to the gradual elimination of fossil fuels, on which we are currently dependent for energy. The sine qua non condition for biomass regeneration lies in the sustainable management of natural areas such as forests, pastures, and plains within each country. Active forest management involves reducing wood consumption and using it efficiently (from a climate perspective), relative to the amount of wood that can be obtained over the life cycle of a coniferous or deciduous forest [4].
The Central European Biomass Conference (CEBC) is organized by the Austrian Biomass Association, the Chamber of Agriculture of Styria, and BEST - Bioenergy and Sustainable Technologies GmbH, in cooperation with Messe Congress Graz. Bringing together over 1,400 participants from more than 50 countries, this conference ranks among the largest events in the global bioenergy industry. Simultaneously with the conference, the following specific events take place:

- The "Häuslbauer" fair, focused on new methods of using green energy in the construction sector, attended by approximately 40.000 visitors;
- The European Pellet Forum;
- Themed trips to various specialized organizations, such as Posch GmbH, Mayr-Melnhof-Holz Holding AG, Hackervorführung Eschlböck GmbH, or Glock Ökoenergie GmbH.

The conference addresses numerous issues related to the use of nonconventional resources. For example, ecological natural gas can be replaced with CO_2-neutral natural gas, free of suspended particles, with these advantages making it a resource fully integrated into the category of renewable energies.

The quantities injected into the network are monitored by authorized companies, like green electricity, and then delivered to end users by energy suppliers. This type of gas can also be stored in large quantities.

According to specialists in bioeconomy and circular economy attending this conference, technologies based on the use of biogas represent the most efficient form of waste recycling to produce energy and fertilizers. For example, various challenges related to the use of organic waste from tourism for biogas production were analysed, as well as the modelling and control of biogas plants according to the demand of end users.

The organization of Pellet Day highlights the growing international interest in pellets as a source of ecological energy, as well as the development progress of pellets in Central and Eastern Europe.

An important conclusion of the specialists is that thermal power plants in Europe need to increase their contribution to climate protection and emission reduction through the continuous integration of renewable energy sources and waste heat, as well as through the ongoing optimization of the technologies used. The conference papers presented solutions for the modernization and optimization of biomass-fired thermal plants, used to ensure clean combustion in biomass boilers and furnaces.

Although biomass combustion is sustainable, certain issues related to particulate pollution still need to be addressed. Some practical examples, implemented in national and international projects, focused on measures to improve air quality through biomass combustion. For instance, the “Clean Air II Trailer” project, featuring three installed furnaces and advanced measurement technology, is used for training future users: it allows testing the heating process, adjusting emission levels, and providing operator training on the efficient operation of the furnaces.

Another important issue concerns the propulsion systems of agricultural machinery, which currently rely exclusively on fossil fuels. To achieve the climate protection targets set for the 2030-2050 period, renewable energy sources must also replace fossil fuels in this sector. Specialists need to identify and implement renewable propulsion solutions for this type of mobility so that they become commercially available and can be adopted by agriculture as soon as possible.

Another significant advantage, particularly during crisis periods, is that the renewable raw materials for fuel production can come from local sources (area, region, etc.).

Technological progress has shown that wood heating represents the main form of renewable energy in Europe. For example, the workshop organized by IEA Bioenergy Task 32 presented the most important topics related to wood combustion in residential buildings:

- Technologies for stoves and central heating methods;
- Models developed based on operational experience;
- Certification methods for achieving high-quality products.

The invited experts explained the latest developments and prospects of advanced control concepts and secondary emission reduction technologies.

The 8th Central European Biomass Conference (CEBC2026), organized from January 21-23, 2026, will offer participants the opportunity to organize their own specialized workshops in customized rooms. To this end, classrooms, equipment, and catering services will be arranged based on personalized pricing offers, allowing specialists and guests to benefit from the synergistic effects of an international conference [5].

Participating companies will be able to choose one of three sponsorship packages (Gold, Silver, or Bronze), which differ in terms of company presentation scope, press area, and visibility in conference materials (program and proceedings). Additionally, companies unable to attend the conference can opt for the Special Logo package, which provides the advantage of displaying the organization’s logo to a wide international audience.

Companies operating in the media sector, nonprofit organizations, and educational institutions can participate in this conference as official partners, based on customized offers that guarantee the following opportunities:

- reaching an international audience;
- Expansion of the partner network through connections with European level policymakers;
- Display of the organization’s profile at the most important event in the bioenergy sector;
- Maximization of advertising effects in print and online media, thereby benefiting from new market opportunities and sector-specific information.

Regarding the use of nonconventional gas deposits in China, the issue is highlighted through political-level decisions, which are subsequently communicated to local areas via notifications, according to the elements presented in chapter 3.

3. THE FUNDAMENTALS OF DEVELOPMENT AND USE OF NONCONVENTIONAL GASES ESTABLISHED IN PUBLIC RELATIONS AT THE POLITICAL LEVEL

Nonconventional natural gases represent a category of natural gas that is not yet fully understood and lacks mature technologies and practical experience for efficient utilization. Nevertheless, they are considered high-quality, efficient, green, clean, and low-carbon energy sources.

Accelerating the development and utilization of nonconventional natural gases is important for ensuring the safe exploitation of coal deposits, expanding the supply of clean energy, and reducing greenhouse gas emissions. China places significant importance on the development of technologies based on the use of nonconventional natural gas. During the 13th Five-Year Plan, the pace of industrialization of nonconventional natural gas increased significantly. Based on the "Plan for Ensuring the Nonconventional Natural Gas Base in Shanxi Province (2020–2025)", the "14th Five-Year Plan for the National Economic and Social Development of Lüliang City", and the "14th Five-Year Plan for Energy Development in Lüliang City", the Lüliang Municipal Development and Reform Commission and other relevant units have developed the "14th Five-Year Plan for Nonconventional Natural Gas in Lüliang City". The plan presents the current stage of nonconventional natural gas exploitation in Lüliang City, based on the analysis of:

- The main achievements in the development and application of nonconventional natural gas during the 13th Five-Year Plan;
- Existing problems and proposals regarding guiding principles, fundamental objectives, planning structures, key tasks, and necessary guarantees for the development of the nonconventional natural gas industry over the next five years.

This plan serves as a basis for guiding the development and application of nonconventional natural gas in Lüliang City, directing the allocation of social resources, making decisions on major projects, and organizing government investments [6]. Due to differences in genesis, reservoir formation mechanisms, and extraction difficulty, natural gas is divided into two categories: conventional and nonconventional natural gas. Compared to conventional natural gas, nonconventional natural gas has larger reserves.

As development and utilization technologies mature, the potential for the development and use of nonconventional natural gas increases exponentially. The nonconventional natural gases included in this plan are:

- Coal-derived gases (coalbed methane, tight sandstone gas, shale gas);
- Natural gas derived from coke oven gas;
- Other types of gases.

Nonconventional natural gas is an energy source that has the following specific qualities:

- High-quality;
- Efficient, clean;
- Low-carbon energy source.

The development of this industry holds strategic significance, making important contributions to:

- The development of China's energy structure;
- The improvement of the population's standard of living;
- The increase of energy security capacity;
- The effective addressing of issues related to climate change.

It will also contribute to Shanxi Province achieving its goals regarding the establishment of a nonconventional natural gas base, the increase of reserves and production, the energy revolution, as well as the safe, green, and low-carbon development and utilization of these resources through the pipelines in Lüliang City. Currently, the exploration and evolution of nonconventional gases in China is still limited to a few regions, and substantial progress has yet to be made in major resource-rich basins. In 2019, the national production of natural gas (including nonconventional gas) reached 177.3 billion m^3, of which conventional gas production accounted for 152.7 billion m^3, and nonconventional gas production 24.5 billion m^3. Due to continuous technological advances in exploration and development, an improved political environment, and lower production costs, nonconventional gas production shows a trend of rapid growth. In 2019, China's natural gas consumption was 306.4 billion m^3, while natural gas production reached 177.3 billion m^3.

Natural gas imports reached 128.8 billion m^3, representing 14% of global LNG trade. China's dependence on foreign gas rose rapidly to 42%. This excessive reliance on foreign gas represents a severe challenge to China's energy security in the current international context. To strengthen China's energy security, specialists are intensifying efforts in the exploration and development of nonconventional natural gas.

Global pressure to cut carbon emissions is rising. Under the Paris Agreement, countries are urged to limit global warming to below 2°C. In response, China has pledged to peak its CO_2 emissions before 2030 and achieve carbon neutrality before 2060, while reducing its carbon intensity by over 65% from 2005 levels by 2030. The strategic importance of vigorously promoting the development of clean, low-carbon energy, represented by nonconventional natural gas, has thus become even greater.

Conventional PR techniques may be sufficient only in certain situations. To stand out and capture the attention of the target audience, very often atypical, novel, and engaging methods hereafter referred to as "Nonconventional" are used.

4. NONCONVENTIONAL PUBLIC RELATIONS

In the field of public relations, which is particularly based on creativity and innovation, nonconventional PR campaigns represent a truly revolutionary process that has a strong impact on the audience.

These campaigns combine social responsibility with nonconventional PR, using various media, such as:

- Cultural models are less familiar to the public;
- Social networks;
- YouTube videos (men-chefs, athletes-using a specific type of detergent; Jean-Claude Van Damme's split between two Volvo trucks);
- Incorporating certain holidays into logos or embedding them in the organization's vision/mission (e.g., celebrating International Women's Day through the design of the McDonald's logo);
- Objectives that could be included in various tourist circuits (workshops by folk craftsmen, visual artists, etc.), parties organized in nonconventional locations (e.g., celebrating the anniversary of a hypermarket's presence in the Romanian market);
- Written messages on paper delivered with packages via courier companies;
- Educational models created by various brands (e.g., Dove's education on self-esteem and self-confidence) [7,8].

The persuasive power generated by the imagination of nonconventional public relations creators is based on [9]:

- The Power of Thinking Differently;
- Getting Creative with Stunts;
- Riding the Viral Wave;
- Engaging Through Gamification;
- The Role of Humor;
- Harnessing User-Generated Content;
- Balancing Risks and Rewards;
- Measuring Success.

Different, nonconventional thinking, as a continuous process, represents the foundation for the development of nonconventional technologies. The implementation of nonconventional solutions in various industrial processes will pave the way toward Industry 5.0 [10].

Different thinking has generated innovative ways of using stunts and various nonconventional locations. Viral challenges generated through social networks contribute significantly to phenomena such as:

- Increasing the visibility of a brand;
- Increasing the engagement of a brand, personalities/celebrities, or ordinary people.

Incorporating computer game-specific components into contexts unrelated to gaming leads to increased interaction and participation. Riddles and challenges create new experiences, enhancing the connection between the audience and a particular brand. The use of humorous elements can help a brand reach a younger audience while appearing more approachable and human.

Promoting user-generated content, for example, videos created by users, creates a strong sense of community, fostering a feeling of belonging and connection with the brand.

The use of nonconventional PR elements also involves certain risks, as it must:

- Not cross the line between novelty and controversy;
- Maintain the balance between innovation and responsibility;
- Take ethical issues into account;
- Consider sensitivities related to belonging to a particular culture.

The evaluation of success achieved using this type of PR can be carried out through:

- Measuring the percentage increase in sales;
- Tracking overtime indicators such as social media engagement, media coverage, long-term brand recognition, and brand sentiment.

In conclusion, nonconventional public relations can significantly influence the market and customers using elements based on originality and surprise.

4. CONCLUSIONS

In the context of the transition to Industry 5.0 (human-centered industry), public relations a symbiosis between human capabilities (acquired and shared within the knowledge-based economy) and intelligent systems (designed to generate a circular and sustainable economy) contributes decisively to the creation of sustainable and innovative solutions. Visits organized to enterprises that utilize nonconventional resources and technologies contribute to increasing interactions between the academic and industrial environments, enabling in-depth knowledge of new technologies and methods used worldwide, depending on the industrial sector in which the respective organization operates. Public relations highlight the reinvention of production, being a phenomenon applied on a global scale, with professionals in this field preparing strategies to ensure a balance between the interests of the organization and those of the public. Public relations are very important for the development of nonconventional technologies, as they represent the 'foundation' of the manufacturing industry, which between 2009 and 2019 generated 14% of the European Union's GDP.

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