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ENVIRONMENTAL MANAGEMENT PRACTICES IN POLISH ENTERPRISES – AN EMPIRICAL ANALYSIS

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Abstract

Environmental management helps firms systematically include environmental issues to enhance a firm's commitment and decrease their impact on the natural environment. For that reason, it has become necessary to study proactive aspects of business management and all the factors that influence the development of environmental proactivity in firms. The article aims to analyze the level of corporate environmental proactivity and its relationship with the size and the sector of activity in Polish enterprises. The environmental pressure perceived by companies was analyzed, too. A questionnaire survey was conducted in 64 Polish enterprises. The results show that the level of environmental proactivity of Polish enterprises is satisfactory and the highest activity of environmental proactivity is observed in the area of operating practices. The interest in the implementation of ISO 14001 and EMAS standards is still little. However, it is possible to observe slow, though systematic, growth in the implemented standards following ISO 14001 and EMAS. The research results reveal that there is a statistically significant relationship between the size and the sector of activity. Environmental pressure is mostly perceived by the management staff. This article also suggests implications and opportunities for future research because relatively little is known about the corporate environmental proactivity in Polish companies.

Keywords: Environmental Management, Environmental Practices, Environmental Corporate Proactivity

1. Introduction

Modern enterprises function in the turbulent environment whose dynamics is also affected by environmental conditions like global warming and growing ecological awareness of societies of many countries. Therefore, enterprises operate under the pressure of the global trend: an increase in the significance of ecological factor in the functioning of enterprises. This encourages many enterprises to take proactive ecological actions. An increase in the importance of ecological factor is also noticeable among Polish enterprises, which leads to an increase in the intensity of the taken practices and environmental initiatives, including the voluntary ones, since there takes place the evolution of environmental management towards the proactive management in a Polish enterprise. This evolution is the result of the dynamics of changes and interactions of the factors affecting them and, particularly, perceiving the role of stakeholders. In the Polish subject literature there is still not much attention paid to environmental proactivity among Polish enterprises.

2. Environmental Proactivity of Enterprises and Its Operationalization

In the world subject literature concerning enterprise management the concept of environmental proactivity comes from the works by Aragón-Correa (1998), Sharma and Vredenburg (1998) and Hart (1995). Environmental proactivity, understood as the voluntary implementation of practices and initiatives aimed at improving environmental performance, can become manifest through different strategies, each characterized by a series of environmental practices (see, e.g., Hart, 1995; Aragón-Correa, 1998; Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003.). Proactive environmental practices are intangible managerial innovations and routines that require organizational commitments towards improving the natural environment and which are not required by law (Hart, 1995). Sharma and Vredenburg (1998), for example, believe that a firm is environmentally proactive if it presents "a consistent pattern of environmental practices, across all dimensions relevant to their range of activities, not required to be undertaken in fulfillment of environmental regulations or in response to isomorphic pressures within the industry as standard business practices" (Sharma, and Vredenburg, 1998, p.733). Garcés-Ayerbe *et al.* (2012) interpret environmental proactivity as a tendency to anticipate internal and external environmental protection requirements, voluntarily making changes rather than reacting to these requirements (Garcés-Ayerbe *et al*. 2012). According to Anton *et al*. (2004), the sum of proactive environmental practices represents a firm's proactive environmental strategy. On the other hand, the set of environmental practices represents different patterns of environmental strategies.Most of the research projects that have attempted to classify different corporate environmental strategies have used this environmental proactivity concept to propose a continuum of behavioural patterns that include from the most reactive, or passive, to the most proactive positions (for example, Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003, Murillo-Luna *et al.* 2008). Henriques and Sadorsky (1999) perform a cluster analysis on a series of items related to more or less advanced environmental practices of firms: having an environmental committee, having an environmental plan, having a written environmental plan, informing shareholders and employees of the environmental plan and having an environmental, health and safety unit. With the results of this analysis, they classify the environmental strategies of firms into four groups, call as: reactive Strategy, defensive Strategy, accommodative Strategy, and Proactive Strategy (Henriques and Sadorsky, 1999). Examples of others environmental practices include utilizing internal assessment tools such as benchmarking and accounting procedures, establishing environmental performance goals, publicly disclosing environmental performance information performing internal and external environmental audits, training employees in ways to improve the environment, and linking employee compensation to environmental performance. By implementing these practices, firms can identify how their production activities interact with the environment and how they can prevent natural-resource degradation (Darnall *et al.* 2010).

To operationalize environmental proactivity of the surveyed enterprises there was used a set of environmental practices suggested by González-Benito and González-Benito (2006). These authors identify three categories of environmental practices in the enterprise such as:

- the *planning and organizational practices* reflect the extent to which an environmental management system (EMS) has been developed and implemented,
- the *operating practices* imply changes in the production and operation system, which plays an essential role in environmental issues,
- the *communicational practices* aim at communicating the company's social and institutional environment the actions taken in favor of the natural environment. Practices like these have been considered as another side of the environmental commitment. According to González-Benito and González-Benito (2006) environmental proactivity can be understood as a triangle whose sides represent the three categories of practices distinguished below in Figure 1.

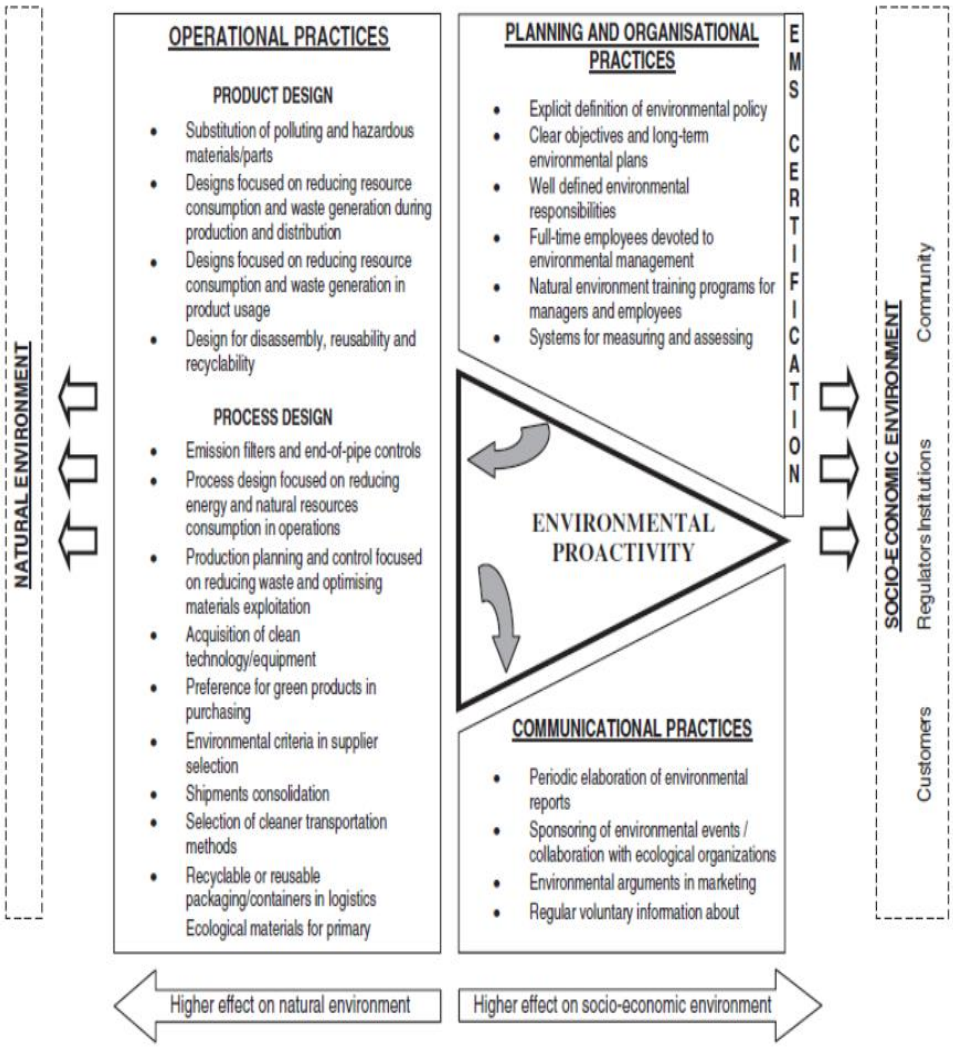

Figure 1. Environmental practices through which environmental proactivity is manifested
Source: González-Benito and González-Benito (2006)

3. Methodology

3.1 Characteristics of the Sample

To accomplish the objective of the paper there has been conducted the analysis of the survey data, obtained on the basis of the questionnaire sent to 400 enterprises in Poland. The level of return of the questionnaires amounted to 17%. After the rejection of incomplete questionnaires, the final size of the research sample was N-64. There was applied the random selection of the research sample, including enterprises operating mainly in food industry (45%), energy sector (27%), mining industry (18%), automotive industry (5%), logistics industry (2.5%), whose impact on the environment is significant (with respect to the use of natural resources and emission of pollutants). Referring to the size structure of enterprises, the share of the sector of small enterprises amounted to 19%, the medium ones - 42% and the large ones - 39%.[1] With respect to the conducted activity there predominated manufacturing companies (57%), and the share of

[1]The criterion of the size of the enterprise is specified by the number of employees: a small enterprise – from 10 to 49 employees, a medium one - from 50 to 249 employees and a large one – more than 245 employees.

the remaining enterprises amounted to: service companies (23%) and trading companies (20%).

3.2. Variables and Hypotheses

The questionnaire was prepared on the basis of the set of environmental practices serving the purpose of measuring enterprise environmental proactivity, suggested by Aragon-Correa, 1998; González-Benito and González-Benito, 2006 (see Figure 1). The questionnaire was modified for the purposes of the research and it was submitted the management staff for assessment, which consisted in qualifying the responses to the statements concerning the application of individual environmental practices on a seven-point Likert scale. The questionnaire was divided into three research areas, concerning the application of three kinds of environmental practices, i.e. operating practices, practices referring to planning and organization of environmental management and communication with the environment, which jointly represented the level of enterprise environmental proactivity. The area of environmental practices of planning and organization of environmental management were described by 8 attributes, 3 attributes describing communication with the environment and 7 attributes describing environmental operating practices. The scales for the measurement of enterprise environmental proactivity are reliable, which was confirmed by high values of Cronbach's alpha coefficient of above 0.8 for all the analyzed areas of enterprise environmental proactivity. The description of voluntary environmental practices in individual research areas is presented in Table 2.

In the second part of the questionnaire there was evaluated the pressure enterprises cope with as for environmental issues on the side of individual groups of stakeholders, i.e. management staff, government and public administration, clients and competitors, owners and shareholders, media, employees, ecological organizations and suppliers (Table 4). The scales in this part of the questionnaire were also found to be reliable, and Cronbach's alpha coefficient amounted to 0.72 (above the acceptable level of 0.7). The questionnaire also included the questions concerning the status of the implementation of ISO 14001 or the Community EMAS standard in the surveyed enterprises.

For the assumed objective of the paper there was carried out the qualitative assessment of the presented environmental practices in the analyzed areas, the assessment of the level of enterprise environmental proactivity and the evaluation of the perceived environmental pressure. To assess the link between the size of the enterprise and the kind of the conducted activity and the level of environmental proactivity the following hypotheses were tested: H_1 *–there is a link between the level of environmental proactivity and the size of the enterprise;* H_2 *–there is a link between the level of environmental proactivity and the kind of the conducted activity of the enterprise.* To assess the verification of the analyzed relations, in accordance with the formulated hypotheses H_1 and H_2there was used the ANOVA analysis at the significance level of 0.05, and for the remaining qualitative analyses there were used descriptive statistics. The dependent variable was constituted by the level of environmental proactivity, whereas independent variables specified the size and kind of the conducted activity of the enterprise.

4. Results

On the basis of the quantitative analysis it was indicated that only 12.5% of all the surveyed enterprises have implemented ISO 14001 standard (8 enterprises, including as many as 5 enterprises having ISO 14001 from energy sector) and 3.1% of all the enterprises have introduced EMAS (2 enterprises). Among the entities which do not have formally implemented both standards, almost 44% do not plan the implementation of ISO 14001 within the nearest 3 years whereas more than 57% - the introduction of EMAS. The results are presented in Table 1.

Table 1. The quantitative analysis of the assessment of implementation of ISO 14001 and EMAS in the surveyed enterprises

The extent to which the enterprises agreed with the following questions	Grouped categories of responses: "definitely yes" and "rather yes"	Category of responses: "I don't know"	Grouped categories of responses: "definitely not" and "rather not"
Does the company plan to implement ISO 14001 ?*	10%	46%	44 %
Does the company plan to implement EMAS ?*	5%	38%	57%

Source: The author's own study
Notes: *the group of enterprises which declared the implementation of ISO 14001 or EMAS was excluded.

The conducted qualitative analysis of the applied environmental practices in the surveyed enterprises shows that the level of proactivity from all the attributes describing it amounted to ($\bar{x}$ - 4.2), which gives the satisfactory score on a seven-point Likert scale. The qualitative analysis of the assessment of good environmental practices in individual areas indicates that environmental operating practices mostly determine a low level of environmental proactivity of the surveyed enterprises. The environmental operating practices, which received the highest rating by the enterprises, include: controlling the use of raw materials, energy and water during manufacturing processes ($\bar{x}$ - 5.56; SD -0.97) and using recycling for remains and waste, segregation and recovery of generated waste and closed technological circuits during manufacturing processes ($\bar{x}$ - 5.13; SD – 0.91). The assessment of product life cycle received the lowest rating ($\bar{x}$ - 3.5; SD – 1.45).

The area of environmental practices in the field of planning and organization of environmental management occupied the second place ($\bar{x}$ - 3.91). In the area of planning and organization of environmental management, the highest rating was received by the practices connected with producing documents, records and instructions for the internal needs for the development of environmental management ($\bar{x}$ - 4.83; SD - 0.86), and also specifying the environmental objectives as the priority ones, which are not only limited to the compliance with the environmental law ($\bar{x}$ - 4.74; SD- 0.94). A very low rating of the practices referring to the organization of seminars on environmental management, ecology and environmental protection for management staff ($\bar{x}$ - 3.15; SD- 0.88) and the organization of environmental training for employees ($\bar{x}$ - 2.5; SD - 1.25), which raise qualifications and ecological competences of the staff significantly underestimated the assessment for the whole area of planning and organization of environmental management. Also the practices serving the purpose of the evaluation of the enterprise own ecological efficiency by using ecological benchmarking at the strategic level received a low rating. In the assessment of this variable there was also recorded large dispersion of the average in the whole group ($\bar{x}$ - 3.5; SD- 1.52).

The area which received the highest rating are the practices of communication of enterprises with the environment by producing and publishing environmental reports ($\bar{x}$ - 3.60; SD- 1.31), and also sponsoring and participation in ecological actions ($\bar{x}$ - 3.49; SD- 1.06). Descriptive statistics for all the analyzed environmental practices are presented in Table 2. The levels of environmental proactivity with reference to the three types of environmental practices are presented in Table 3.

In the second part of the research there was evaluated the impact of pressure by individual groups of stakeholders on environmental practices undertaken by the enterprises. The obtained descriptive statistics show that management staff have the largest impact on the developed environmental practices ($\bar{x}$ - 4.7; SD- 0.89). The enterprises almost do not notice the pressure from suppliers ($\bar{x}$ - 2.4; SD- 1.29) and non-governmental ecological organizations

($\bar{x}$ - 2.6; SD- 0.96). The results of the assessment of pressure of the individual groups of stakeholders on environmental actions are presented in Table 4.

Table 2. Voluntary environmental practices reflecting enterprise environmental proactivity (N-64)

Research area	Environmental practices	Mean	SD
Practices concerning the communication with	We regularly produce and publish ecological reports	3.60	1.31
	We regularly sponsor ecological actions and actively participate in them	3.49	1.06
	We underline our involvement in marketing actions for the benefit of environmental protection	4.44	0.91
Practices of planning and organization of environmental management	Cyclically, we conduct internal environmental audits	4.02	0.83
	We regularly conduct seminars for the management staff in the field of environmental management, ecology and environmental protection	3.15	0.88
	We regularly provide employees with environmental training	2.50	1.25
	We develop our own environmental program(s) to develop environmental management	4.39	1.13
	Documents, records and instructions are produced for the internal needs for the development of environmental management	4.83	0.86
	In the enterprise organizational structure there is a person solely responsible for environmental management	4.15	0.93
	Environmental objectives in the company are treated primarily and they are not limited only to the compliance with the environmental laws	4.74	0.94
	We conduct the strategic ecological benchmarking	3.50	1.52
Operating practices	We use recycling of remains and waste, segregation and recovery of generated waste and closed technological circuits	5.13	0.91
	We minimize the ecological risk by the implemented systems for prevention of accidents and ecological disasters	5.05	0.99
	We regularly cooperate with suppliers to improve environmental standards	4.77	1.14
	We regularly assess product life cycle (LCA)	3.50	1.45
	While designing products and services we take into consideration ecological criteria (eco-design)	4.80	1.11
	We systematically control the use of raw materials, energy and water during manufacturing processes	5.56	0.97
	While purchasing we take into account the environmental performance of the offered raw materials, semi-manufactured goods, products	4.85	0.87

Source: The author's own study
Notes: SD-standard deviation

Table 3. The level of environmental proactivity of the surveyed enterprises (N -64)

Environmental proactivity represented in the framework of the three categories of environmental practices	Mean $\bar{x}$
Practices of communication with the environment	3.84
Practices of planning and organization of environmental management	3.91
Operating practices	4.81
The level of environmental proactivity	4.18

Source: The author's own study

Table 4. The assessment of the environmental pressure from individual groups of stakeholders in the surveyed enterprises (N-64)

Pressure from individual stakeholders	Mean $\overline{x}$	S.D.
Management staff /central office of the company	4.7	0.89
Government and public administration	4.4	0.91
Clients	4.2	1.14
Competitors	4.1	0.98
Owners and shareholders	3.9	1.25
Media	3.5	1.35
Employees	3.2	0.93
Ecological organizations/(NGOs)	2.6	0.96
Suppliers	2.4	1.29

Source: The author's own study

In reference to the size structure of the enterprise, the highest level of environmental proactivity was recorded in large enterprises ($\overline{x}$ - 4.4), then in the medium ones ($\overline{x}$ - 4.1)and the small ones ($\overline{x}$ - 3.8). Manufacturing companies are characterized by a higher level of environmental proactivity in comparison with trading and service companies. To assess the significance of the difference of the average of the level of environmental proactivity with respect to the enterprise size and the conducted activity, there was used univariate ANOVA analysis. The conducted analyses of variances for all the variables specifying the level of environmental proactivity showed that the size of the enterprise significantly influences its diversity and so does the kind of the conducted activity of the enterprise, which constituted the basis for the adoption of the hypotheses - H_1 ($F_{(2.61)}$= 5.13 p = 0.0002) and H_2 ($F_{(2.61}$)= 15.1 p = 0.0000). All the results were statistically significant at the significance level of 0.05.

5. Discussion

The conducted research indicates that the level of environmental proactivity in Polish enterprises is satisfactory and the largest activity may be observed in the area of environmental operating practices which in the surveyed enterprises mostly concern the use of natural resources in the area of production management and the smallest activity – in the area of the communication of the enterprise with the environment. These results correspond to the results obtained by Ryszko (2007), who observed that the highest level of environmental proactivity of Polish enterprises in the Silesian Voivodeship is noticeable in the area of organizational structure and the application of elements of ecological marketing and communication of enterprises with the environment (Ryszko, 2007). High rating of environmental operating practices given by the surveyed enterprises, which are to minimize the use of energy and water during manufacturing processes, results from reduction of operating costs since, when analyzed by the enterprise, they belong to the sectors whose use of natural resources during production is significant. Environmental operating practices, particularly the ones oriented towards the production process and improving its eco-efficiency, serve the purpose of reducing costs more than other practices of this kind. Therefore, enterprises, first implement less advanced environmental operating practices, which do not generate costs and whose ecological effect are noticeable in a short-time perspective. It is underlined that the application of the eco-efficient environmental practices constitutes the first stage in aiming at the application of more advanced proactive environmental practices.

The area with the lowest rating are the practices of communication of enterprises with the environment, and only the dialogue with the interested parties, and also publishing environmental reports guarantee an increase in transparency of enterprises, their reputation and legitimacy in relations with stakeholders. The dialogue with the environment and environmental reporting is the source of information and ecological knowledge for enterprises, which may be used in the constant assessment of products, services or methods of the

surveyed organization against the background of the achievements of competitors as the basis for using benchmarking, including the ecological one (Krupski, 2004). As it results from the research, these practices are underestimated and the use of ecological benchmarking is particularly little common and, at the same time, it is not treated as a credible source of information and ecological knowledge for the surveyed enterprises. Undoubtedly, this indicates that it is still not so commonly used for searching for the best environmental practices and competency gaps in the improvement of environmental management in the enterprise. This results from the fact that Polish enterprises are unwilling to share their knowledge and information due to psychological reasons (Skowron, 2010).

The obtained results of quantitative analysis indicate still a small interest in the implementation of ISO 14001 and the Community EMAS standard among Polish enterprises. However, since 2003 there has been an upward trend in the number of enterprises certified according to ISO 14001. In 2008 in Poland there were 1544 enterprises certified in accordance with ISO 14001 (the 10th position of Poland in the EU). Unfortunately, in the years 2003 – 2010, an increase in the number of organizations having the implemented EMAS in Poland was minimum, only in 2012 there was noticeable growth. In 2012 EMAS was possessed by 39 organizations (Eurostat, 2014). Nevertheless, it is necessary to pay attention to the fact that Polish enterprises implement environmental practices in spite of lack of formally implemented ISO 14001 or EMAS in the enterprise. However, only certified enterprises and their good communication with the social and economic environment is easily diagnosed by external stakeholders which, potentially, has a stronger impact on the perceived reputation and business results than operating practices. As González-Benito and González-Benito (2006) notice planning and communicational practices have therefore the potential to influence business performance rather than environmental performance since they can reduce pressure and attract green customers. However, the practices which can actually change the environmental performance of the company, that is which can reduce resource consumption and waste generation, are the operating practices, which are in turn less perceivable by the social and economic environment (González-Benito and González-Benito, 2006). The analysis of the assessment of the environmental pressure by the enterprises shows that this is the management staff who feels the largest pressure on taking voluntary environmental practices. It suggests that attitudes and behavior of the management staff most significantly stimulate environmental activities. This fact is also confirmed by the research concerning the conditions of the implementation of environmental proactivity indicating the predominating impact of factors coming from the inside of the enterprise (Murillo-Luna *et al.* 2011). The set of environmental practices the enterprise will implement depends on the opinions, expectations, ecological awareness and attitudes of management staff (Menguc, 2010). Different types of stakeholders' influences lead to different types of sustainability practices, from initial matters such as pollution control and eco-efficiency, to advanced issues involving the redefinition of the business and industrial ecosystems, including intermediate phases related to material recycling and process redesign (Sharma and Henriques, 2005, see Garcés-Ayerbe *et al.* 2012).

The results of the conducted research indicate that there is statistically significant impact of the size of the enterprise and the kind of the conducted activity on environmental proactivity of enterprises. These results correspond to the results of the research conducted in Polish enterprises (Ryszko, 2007). Many international studies also confirm that *firm size* has a significant effect on the degree of environmental proactivity, with larger firms being more likely to adopt proactive environmental practices (Aragón-Correa, 1998; Aragón-Correa *et al.* 2008; Darnall, 2010; Murillo-Luna *et al.* 2011). Larger firms are associated with environmental proactivity to a greater extent than smaller firms (Etzion, 2007). Each sector of the activity of enterprises also shows different motivations and attitudes towards environmental management, and enterprises operating in industries strongly polluting the environment show the higher level of environmental proactivity (González-Benito and González-Benito, 2010).

6. Conclusions

Polish enterprises show the satisfactory level of environmental proactivity, and the largest activity has been observed in the area of environmental operating practices. It seems that Polish enterprises are at the initial level with respect to the advancement of environmental practices, due to the application of environmental practices reducing the use of energy and water and the amount of generated waste, which are implemented first (Smith and Kemp, 1998). The conducted analysis of the relations indicates that in Polish enterprises there may exist the conditions for environmental proactivity, which are pointed in the international literature. It has been proved that the size and kind of the conducted activity of the enterprise determine the level of environmental proactivity. However, the further research deepening the analyses of environmental proactivity of Polish enterprises and monitoring the changes in both the level of environmental proactivity and its conditions is necessary.

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