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## Article

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# The Role of Business Environment in Reshaping the Textile Industry

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**Abstract** Apparently, the international competition is strong in the area of investment in new technologies and expecting for their results to be applied at the right moment. Nanotechnology is from far the most wanted by investors. During the last twenty years, developed states invested in nanotechnologies as a priority for their policies and in time this trend was followed by the less developed countries. At the opposite side, there are countries as Romania that seem to not keep the step with times and lose the start in front of those very active in this field. This paper tries to focus on the role of the Romanian business environment to reshape the textile industry through new technologies and nanotechnologies especially. As the methodology, the in-depth interview method was used to get the information from the most important actors in Romanian business textile field. The conclusions show that a lot of measures are required to change the mentality and the working style. The study reveals also that together with the state involvement the industrial policies must be changed. In the same time, this research gathered some recommendations as pragmatic solutions to take seriously the role of business environment for bringing its contribution for this challenge.

**Key words** Technology, nanotechnology, textiles, Romania, industry

**JEL Codes:** L66, O32, O33

## 1. Introduction

The changes in international trading had a great impact on traditional textiles and forced their production in cheap labour countries. In the same time, sophisticated and technical products incorporate technologies discoveries and they are used in all the industrial activities. These products are manufactured in countries where the competitive advantages are important and kept inside the borders, since they can be produced there in big quantities and in good conditions from the cost point of view. At the first glance, new technologies require huge investments and intensive research activity. From all new technologies, nanotechnologies are the most attractive for investors and research projects, but starting from a certain level all these technologies can cross boundaries and interfere.

Apparently, the international competition changed to area of investments in new technologies and expecting for their results to be applied at the right moment. Nanotechnology is from far the most wanted by investors. During the last twenty years, developed states invested in nanotechnologies as a priority for their policies and in time the trend was followed by the less developed countries. At the opposite side, there are countries as Romania that seems to not keep the step with times and lose the start in front of those very active in this field. This paper tries to present the role of the Romanian business environment to reshape the textile industry through new technologies and nanotechnologies especially. Because of the poor statistical information, this research is based on the qualitative method. Thus, the in-depth interview was the most helpful method to gather information from the most important business actor in textile field.

## 2. Literature review

From all the technologies, nanotechnologies seem to be the most interesting. That is why a consistent literature is dedicated to them, even if they are only in small numbers on the market. Relevant statistical data are not available that is why most of the books, articles and reports use more qualitative methods to gather useful information from the main actors in this field. From the theoretical point of view, nanotechnologies are defined as technologies creating new properties by using raw materials at the nanometric scale, that means dimensions between 1-100 nm (Ramsden, 2009; OCDE, 2010).

Nanotechnologies improve technical parameters of new products and new materials in comparison with the existent traditional ones. That is why a careful analysis is required in terms of cost and price since they reconfigure the value chain configuration, but being very dynamic it is difficult to anticipate their market trend. The European Commission (2013) shows that the entire industrial landscape will be changed by these technologies and the entire our life will improve. So, soon, the industry will feel the impact of nanotechnologies. For this reason, a glance on their development conditions is necessary for the presenting research.

Studies (Radan Ungureanu, 2015) show that new or discontinues technologies suppose fundamental research based on inter or trans-disciplinary. Also, the Community framework for state aid research and development (2006/6/323/01) defines the fundamental research as a theoretical and experimental activity to gain knowledge by studying phenomenon and facts

without practical applications. In this way, the experimental activity uses the entire knowledge to propose plans regarding the production, design new architectures to improve products, processes, or services.

Nanotechnologies, in their fundamental phase do not suppose a technology tradition, but they require a certain infrastructure on physics, chemistry and other sciences brought to a level when they all interfere. At the beginning the discoveries were continuous, but step by step they became discontinuous due to the need to cover a lot of requirements all in the same time. This asked for cooperation through sciences and interdisciplinary become the new trend of the research.

The study (Radan Ungureanu, 2015) shows that nanotechnologies are used in places where state consider seriously the research and development activity and the societies are focused on education and on high level of knowledge of the work force. Multinational companies invest a lot to develop new technologies in places where advantages could be an opportunity to be explored by those interested to be a part of a certain value chain.

As FMER (2013) shows the nanotechnologies applications were developed even for textiles and they are applied to wear items as well as to technical ones. The most innovative discoveries are applied successfully in health, environment, and industries. As the studies (ObservatoryNano, 2011, p.39) show researchers concentrated on improving physical characteristics for traditional textiles and obtaining durable and thin fabrics used in all the existing industries.

The nanotechnologies literature is expressed by using always the future tense. Even the figures and tables show estimations for the future. Even so, investing in nanotechnologies is a sort of a cover for the future; as the study (Radan Ungureanu, 2016) shows, they will replace the traditional industries, but now they are shaping the landscape of the future industries by putting together companies, states, and the entire society. Finally, these technologies have a great impact on employment, involve a very high qualified work force and they generate added value inside a country. That is why all the countries, even those without technological tradition must take them in a very serious consideration.

### 3. Methodology of research

Even if the reports regarding the research activity in Romania are not optimistic, Romania used to be one of the top supplier for textile workforce. The innovation is incremental and very poor due to the lohn activity concentrated on the fashion products and less on the technical or sophisticated products. The main research projects at the European level are dedicated especially to technical products. That is why the Romanian researchers cannot keep the step with the trends and so less actors are interested in developing and applying Romanian discoveries.

As it can be seen in the Table 1 and Table 2, Germany is by far the leader in nanotechnologies and from the non-European countries Switzerland keeps the most important results. At the opposite side, Romania and Bulgaria are the last in this field, but it is obvious that the publication activity seems more intensive in comparison with patents register. The number of publications could be translated as an intensive trial to obtain and to be involved in the activity.

Table 1. Patents evolution 2011-2014

Country	2011	2012	2013	2014
Germany	665	693	775	759
UK	130	136	151	170
France	368	344	379	394
Italy	60	92	70	89
Sweden	45	58	55	60
Switzerland	168	158	219	233
Holland	157	188	182	176
Finland	12	24	23	32
Spain	24	24	31	32
Belgium	76	84	76	92
Denmark	54	51	51	45
Norway	11	13	12	11
Austria	26	40	40	50
Romania	0	0	1	1
Poland	0	7	4	7
Czech Republic	7	3	9	11
Bulgaria	0	0	0	0
Greece	3	1	5	5
<b>Total</b>	<b>1806</b>	<b>1916</b>	<b>2083</b>	<b>2167</b>

Source: StatNano (2015)

Table 2. Nanotechnologies Publication evolution 2011-2014

Country	2011	2012	2013	2014
Germany	6834	6987	7494	7868
UK	3440	3628	4098	4359
France	4554	4823	5204	5220
Italy	3004	3225	3669	3743
Sweden	1149	1244	1381	1546
Switzerland	1408	1554	1599	1712
Holland	1288	1332	1553	1473
Finland	645	695	753	859
Spain	3055	3429	3687	3894
Belgium	1032	1034	1169	1217
Denmark	628	628	699	840
Norway	424	296	338	290
Austria	711	676	739	771
Romania	796	761	922	812
Poland	1294	1486	1740	1930
Czech Republic	613	669	808	915
Bulgaria	209	189	230	199
Greece	522	565	598	619
<b>Total</b>	<b>31606</b>	<b>33221</b>	<b>36681</b>	<b>38267</b>

**Source:** StatNano (2015)

That is why this paper aims to understand the role of business environment to help nanotechnologies implementation into the textile industry and to complete the previous study (Ungureanu, 2017) regarding the role of the research environment to achieve the same purpose.

As Chelcea (2001) says, choosing a research method depends on the objective and the subject analysed, but sometimes studying the objects in their natural environment could be more helpful.

Seidman (2006) says that sometimes personal experiences are relevant to obtain a picture of the reality that is why the in-depth interviews method are the most suitable in the dynamic fields.

The qualitative research creates a holistic image based on the real stories that is why this method was applied during this study. For this reason, this research is focused on getting information directly from the best Romanian subjects able to offer us a holistic image of the research applied to textiles. Thus, the main objectives of this research are:

- Identifying the level of knowledge for new technologies in the textile field
- Identifying some personal experiences to define the advantages and obstacles from different research and development projects
- Identifying the value added that could be brought into the innovative value chain.

Each goal was reached through a set of five questions. The research was applied to the most important 20 Romanian actors involved in textile field; they use to activate as entities from research and development, state, and private companies.

This paper will present only the results obtained from 10 actors (the main important actors – companies and clusters - involved in textile field).

The limits of this research are identified as following:

- The lack of the statistical data does not allow a quantitative analyse
- This field is very new in Romania and the history is short and the technology diffusion is very difficult to follow even because of a weak industrial environment
- The cooperation with the textile institute was very difficult during this research; regarding general topics, the questions were sent first and after a proper documentation the answers were received. At the opposite, the most cooperative were the private companies interviewed.

The interview was structured on three parts. The first one was questions guided to obtain an idea about the level of knowledge regarding the technologies applied to textiles. The questions asked about the type of technologies known, why nanotechnologies seem to present more interest to researchers in comparison with other new technologies, if the Romanian textile future will be nano or a different one, what projects are known to consider new technologies in this country.

The second part of the interview was structured on questions that allow getting a picture of personal experiences that could be used as strength in a partnership. In this way, the questions were concentration on getting details from own experiences, scientific or information sources, own opinions about how could new technologies be implemented in their workplace.

The last set of questions was dedicated to catch the potential value added in a partnership. In this way questions were focused on obtaining details from the day by day activity, regarding lobby for new ideas or own opinions, brainstorming for what it could be done to convince investors to develop business and research activity in Romania.

#### 4. Results

Generally, the business environment is well informed about the trends in textiles, aware of the influence of the new technologies in reconfiguring new production styles. Some specific examples about companies already using nanotechnologies were identified during this research; this was a sign that business environment is well informed. The information is gathered from international fashion fairs or from Internet.

During the interviewing process, two important actors involved in nanotechnologies were identified; one of them is a producer of a smart fabric, the other one is a private research company testing a nanoparticle machine on different types of cotton.

All the new technologies were considered a basement for added value especially for small and medium enterprises – this could be a hope for them since the new textile industry requires small or medium quantities and only certain producers could adapt to that.

Disadvantages come from the characteristics of the smart production that reflect high costs and finally high prices; then, the cycle from the idea to the market takes too long; besides, the demand for smart products is quasi-inexistent in Romania. This means, the smart products require a niche market approach and it is not available for everyone.

All the interviewed persons admitted that the mentality is the most important obstacle to get the subject from its best perspectives and awareness is the first step to act in a specific way.

The representative of the company producing smart fabric confessed that niches activity requires a qualitative and a quantitative approach: qualitative refer to integrating product in different industries, quantitative means selling less but expensive; the potential of the market will never grow exponential so certain behaviour is required by the player. The applicability of the smart products is a result of the company strategy on the market or a matter of fashion. The niche supposes an optimisation between demand, price, marketing (promotion) and fashion. All these parameters make difficult positioning on the niche.

Regarding the perception about the research environment, business people think that researchers do not follow the trend, they focus on the project. Unfortunately, it is not the idea that brings the project, first comes the project and later an idea is born and this working style is not efficient at all. Another complaint comes from the results that researchers ignore to be applied in practice, even when a patent was created. Generally, the patent belongs to the research institution that is not interested to cooperate in order to be applied, not even to sell it. Besides, researchers should work more transparent, as a confirmation that they spend money properly.

As a general perception, the textile industry is still strong and powerful, but there is no effort to reshape it in a modern way. A lot of investments are required to revive old industries that does not exists any more in Romania, that represented a successful history of the Romanian textile industry once upon a time such as linen and hemp industry.

An optimistic perspective shows that the demography and future illnesses treatment will have a great impact on textile industry. Also, the cooperation between researchers and business was improved during last years. The clusters offered all the support necessary to inform companies about the legal procedures to obtain all the certificates required to operate as European partners. The research revealed also that some companies got experiences in projects regarding implementing new technologies (such as SONO, LIGUIN, EUREKA). Their experiences made them aware that raw materials are difficult to be found since in Romania they do not exist.

Also, another problem identified during their projects regarded the managing of waste obtained during the tests.

The research departments are not often found, only in the case of the producer of smart fabric it exists; there people with different background cooperate to respond to the customer request. At the level of clusters, the management is directly involved in the activity, without a strong cooperation between the members. The relationship with authorities is strong only when some policies are necessary to be implemented. The cooperation with universities and research environment is not often transparent, business people require a lot of details that researchers are not willing to offer. To improve the working style between these two parts, business environment could ask the researchers for testing the capacity to produce samples.

Regarding the effort to persuade foreign investors to invest, the conclusion is that small business that bring small profit do not attract. A model from the past, the Lohn activity, could be a solution to implement new technologies. To make a change

step by step is very difficult, not only because of the mentality, but because of the limited production space, where new technologies are difficult to mix with new ones.

Even if clusters concentrated efforts to bring foreign investors, some errors in communication stopped the process. On the other side, the investors are interested in obtaining immediate advantages. They do not seem to have patient to wait for long time especially because of the payment conditions used in textile field that do not seem encouraging at all.

The cooperation between business partners is sometimes chaotic and not focused on a certain goal. It is important to understand that new technologies suppose new collaborations, but not always totally different, it can be just a little different from the existing one. So, a culture of a good cooperation must be developed.

The obstacles in implementing new technologies are explained in terms of financial, public auctions, difficulties in approaching foreign partners (Russia) because of geopolitics, low-price (the partner does not care about the effort, only about the result), weak cooperation with research environment, inadequate policy dedicated to clusters, lack of trust.

The strong point of the Romania comes from the seriousness of some people, ability to produce small quantities, low cost of the research (but not always efficient) and some advantages that come from the fiscal policies.

To persuade investors to come is a challenge to find a way and convince them about the opportunity to obtain important added value.

The mentality could be changed through intensive advertising campaigns, an open willing to cooperate with research environment (but the managers of the research institutes should contact companies to present new ideas).

Another advice shows that investors should invest depending on their experience. The still low cost wages practised in textile field could attract people to develop business.

As recommendations, the business environment requires from the state:

- Transparent contracts;
- Stable and long life policies (in terms of legislation, energy costs, taxes etc.);
- Companies from clusters must be better quoted during the auction process;
- Partnerships with research institutes must require less than 50% contribution in a partnership;
- Reduce of abusive controls;
- Create an integrative industrial policy;
- Return VAT in short time;
- Reduce cost with remuneration;
- Exonerate taxes for research activity;
- Offer support to companies to be promoted;
- A better management of the education system;
- Academical environment must involve young people with fresh ideas to restart research activity and to improve communication

Concluding, the business environment must find solutions to provide a good partnership and to look for patents from abroad and develop them inside the Romanian borders.

## 6. Conclusions

The business environment is generally well informed about what happens inside and outside of Romania. The existing experiences could be helpful to obtain good results in case of a change of business. Human potential should offer a response to the increase of the added value when it is about the low-cost, but new type of business requires reconverting to new orientation. International cooperation built in time especially due to the lohn activity should offer an inspiration for new type of commercial trading.

EU membership opens large means for cooperation among partners of different nationalities and that brings opportunities of finding new ideas, partners, and financing. This opportunity makes easier for small companies to find a place in the clusters where the new technologies are the central approach.

Communication could be considered as an issue to be improved since the experience until now showed a cause of failure in some cases that were investigated.

The lack of investments and investors is a serious goal to focus on and to discover solutions since the new technologies could be implemented by them.

Mentality is another issue to concentrate on and to act continuous since it requires time to change.

A solution to find raw material should be an international data base where the suppliers could be found.

The weak cooperation style could offer explanation for the weak results of today. Success requires a new relationships approach.

Business depends strongly on politics and geopolitics. In some cases, new partners have to be discovered, by respecting all the international rules where Romania is involved.

The subject is a good opportunity to reconsider national policies regarding clusters, industry, and education. Also, it represents an opportunity to eliminate all the rules that destroys competition and rethinking national programs. New technologies suppose rethinking business in a new way, but the state must offer stable fiscal policies. Maybe it is the right time to consider that the culture to cooperate with all the main actors of the society is the best solution in times of profound industrial changes.

The conclusions are synthetized in the following SWOT matrix-table (Table 3):

Table 3. SWOT matrix

<b>Strengths</b> Information and knowledge Experiences Human potential International cooperation EU membership	<b>Weaknesses</b> Communication Investments/Investors Mentality Raw materials Weak cooperation generally Geopolitical context National policies (clusters/ industrial, education)
<b>Opportunity</b> Legislation to improve the research and education activity Eliminating rules that destroy competitiveness Rethinking national programs	<b>Threats</b> Rethinking business in a new way Instable fiscal policies Culture of no cooperation

**Source:** Author's vision

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