

# Marketing and Business Development between Idea, Scientific Discovery and Innovation

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Starting from the emergence of the basic ideas, scientific development of them to successive innovations derived from, the paper develops around the way in which marketing science contributes to the business development. It is presented the vision of marketing from a historical perspective that characterized feudalism, communism, capitalism and knowledge based society. Based on documentary research is discussed the necessity of adopting innovations and the multidisciplinary nature of innovation as a process. European policies are presented for the development of innovation and regional development programs already implemented. The paper concludes by highlighting new facets of the innovation concept in economic theory, the legal framework for the marketing of innovative technologies and the limits of intellectual property rights of those who innovate.

**Key words:** Marketing, Idea, Scientific Discovery, Innovation, Development.

**JEL classification:** D46, E20, I25, K20, M31, N10, O31, P50.

## 1. Introduction

There are different ways in the literature, to explain innovation. The differences start with the definition of terms. Thus, a differentiation of basic terms such as „invention”, „scientific discovery” and „innovation” is mandatory (Garcia and Calantone, 2002). Researcher’s studies (Markides, 2006, Hesselbein and Goldsmith, 2009), have showed that a single idiom, such as innovation, cannot be extended to the whole field of inventions or to that of new discoveries. Even though the inventions, scientific discoveries and innovations basically solve a new problem or imply a new way to address old problems, it would be a mistake if they are to be regarded as one and the same (Markides, 2006). The concepts are different but can be seen as intertwined, one relying on each other in a constructive way (Guarini et al., 2014).

The process starts with and develops from an invention (Tellis, 2006). With the invention on the workbench, researchers, using existing theoretical concepts, start putting in theory (Thomond et al., 2003), everything that can explain the work of that invention (Christensen et al., 2006). This strengthens the knowledge base of humanity or widens its limits (Christensen et al., 2011). Based on understanding the work of the original invention, new standalone inventors or members of R & D centers, develops several innovations or successive improvements of the invention. The science of marketing (Sheth, 2011), acts as a catalyst, whatever the stage at which an invention is developed (Hauser et al., 2006). Depending on the goals and objectives considered, (Slater and Narver, 1998), through marketing it develops optimal results for those involved in the process of bringing to market the new discoveries (Vilaseca-Requena et al., 2007).

In a graphical illustration, Figure 2, we can distinguish inventions, denoted by 1, regardless of their nature, as structural pillars on which the whole context of the innovative development environment of human society is sustained. A small area, denoted by 2, represents the inventions that rise on the market due to research conducted by specialists in a scientific way. In this area works, mainly people from universities, research centers and development institutes created in order to develop new knowledge. This is the area of scientific discoveries, where work is rigorously organized on theoretical and practical concepts developed over time. The area comprising both inventions and scientific discoveries, and which develops them further, denoted by 3, is the innovations area. From a single invention, Figure 1, which can be drawn from academia as a certified scientific discovery or which can be drawn from a distinct inventor who had an extraordinary vision, but who cannot fully explain the principles underlying his discovery, start all subsequently developed innovations. Innovations are complementary developments of inventions or successive improvements of them.

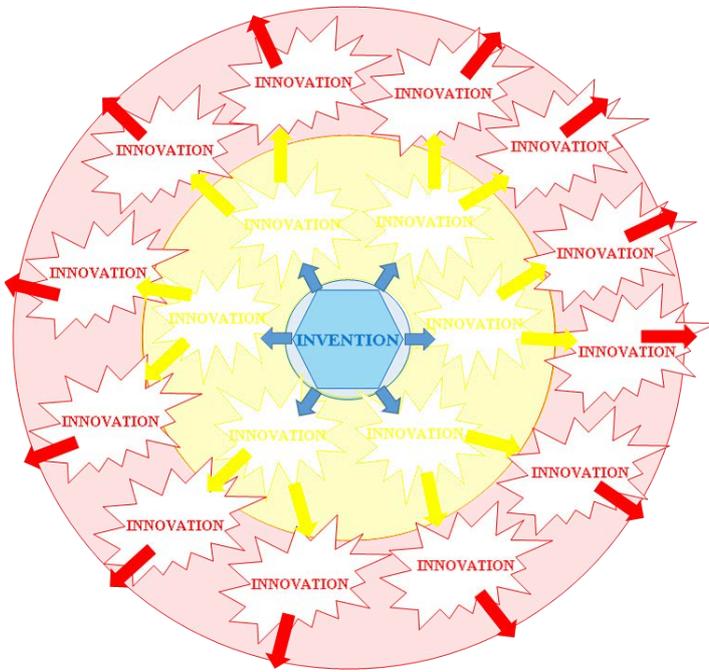
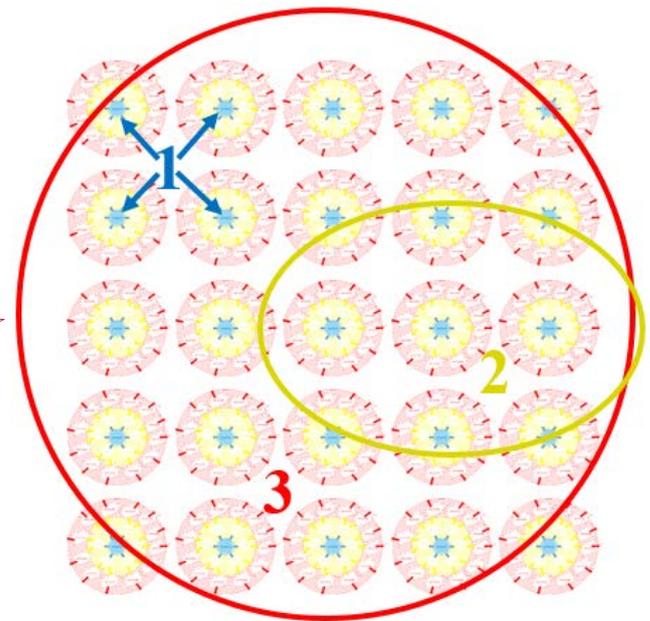


Figure 1. Invention, the center of innovation. Detailed view.

Source: Compiled by author



1. INVENTIONS  
2. SCIENTIFIC DISCOVERIES  
3. INNOVATIONS  
Figure 2. Inventions, Scientific Discoveries and Innovations. General view.

Source: Compiled by author

## 2. Invention

The first discovery, which may not be scientific, results in the creation of a novelty (Kenny, 2012) that has a great potential to increase productivity or to develop science (Bowman and Taengnoi, 2013). Those who have to solve a confronting problem (Popa, 2013), will be able to invent a solution faster than those who realize and try to solve the problem, but are not being directly affected by it (Bowman and Taengnoi, 2013).

The marketing science (Kotler and Armstrong, 2013) promotes inventions, whereas poses no limitations, but rather do everything possible to attract and to take into account the views of all individuals participating in the process of inventing new things. Not putting restrictions and stimulating any idea coming from anyone (Barak et al., 2014), makes the number of ideas to grow rapidly (Stevens and Burley, 1997) and thus at least some of them have a chance to become genuine inventions. As it can be easily seen from Figure 1, the core of innovation is invention. Based on it, the process of continuous improvements begins, or the operating principle can be taken and applied in different context, thus obtaining innovations. Once the process is started, an innovation attracts another innovation in a continuous iterative process. The more radical an invention is (Beck et al., 2014) the greater is its potential to generate a greater number of innovations.

## 3. Scientific discovery

Most discoveries that had an impact in time over economic systems, had at first practical utility and only later theorists have defined and categorized operating principles, solidifying through analysis and synthesis the technical part of the practical application. By undertaking research based on existing theoretical concepts at a time, an invention can be achieved, but usually scientific discoveries complement and clarify the inventions spontaneously developed. A scientific development is reached by following two distinct paths of action. The first way is to take an invention attained by a researcher, in a more or less scientific fashion, through empirical investigation. By rigorously pursuing experimentation, both theoretical and empirical despite the difficulties (Friedman, 2010), the inventions are explained by theory. The invention is analyzed, dissected and reconfirmed, and finally the theoretical basis supporting scientific discoveries is extended. The second way is that of theoretical study and its transfer in practice. Based on existing theoretical concepts built upon a time, new theories are built to be validated (Nieves et al., 2014). The moment of consistent validation, both theoretical and practical, represents the birth of a new scientific

discovery. Using this second method, it is built through successive steps technique. Once a theory has been proven, the next steps widen further the horizon of scientific knowledge. This theoretical approach will ultimately produce, rather incremental than radical, innovations. Following the documentation and description of inventions and their mode of action or operation, the foundations of consequent innovations development are established.

The science of marketing supports scientific researchers in their quest to understand and describe how an invention work, by motivating those categories of specialists (Barker, 2005), which through specific skills may contribute decisively to shorten time needed in understanding and explaining of operating principles. Being a science with a heterogeneous opening, the marketing science helps create specialists teams with different visions and interests that, by working together, can overcome the main barrier in inventions, that is to limit inventions boundaries, namely by thinking only in their own area of specialized training. Most often, people outside the investigated area (Barker and Stiever, 2001), manage to instill to researchers of the respective area, those clues needed to overcome critical thresholds of understanding underlying functionality of an invention (Hesselbein and Goldsmith, 2009).

Science accumulated to a certain point, facilitates usually the introduction of new concepts, but sometimes can also obstruct them at the beginning (Nieves et al., 2014). The innovative spirit is based on existing theoretical concepts and theoretical discovery increases the hope of developing new things. The need for scientific understanding is achieved through serious theoretical studies, although “Chance favors only the prepared” to accept that they can discover something extraordinary, even if they look for something different (Pasteur, 1854). Long-term objectives, with attention on new observations that can be intertwined through embracing change and choice of extreme paths, difficult to follow (Friedman, 2010), lead to very constructive results. In Figure 2, the area represented by scientific discoveries is narrower in the general picture of innovation, in order to highlight its continuous expansive character.

Analyzing in a historical perspective, a description of the consequent economic systems is required, and also of the influences that they have had and still have on the forms that scientific discoveries took over time. There are analyzed both the economic and scientific components regarding innovation in feudalism, capitalism, socialism and knowledge based society.

In feudalism under constraints due to mentality, innovations were introduced and accepted with great difficulty (Crosby, 1997). Most inventions were used for military purposes, to ensure better management of resources (White, 1964). Yet military discipline imposed social change and innovations began to be accepted (White, 1964). Those who had been innovating, most often, in addition to their ideas, risked their life for the inventions and their line of work was not conducted according to scientific rules (White Jr, 1975). The most important adoption of an innovation in the medieval age, can be considered switching to Arabic numbers (Boncompagni et al., 1862) as a result of the method of calculation developed by the mathematician Leonardo Pisano (Grimm, 1973). In the government principles of central organization maintained by local authorities (Nelson, 2001), laid the foundation for the development of relations, nowadays called franchising, which are still successfully and widely used today, by many organizations such as McDonald's (Nelson, 2004).

Capitalism, as a form of organization, has always promoted competition (Schumpeter, 2013). The competition favors those who succeed in bringing first to the market a novelty. In such a society, innovators are promoted and their ideas quickly find an economic use (Terborgh, 1950). Free movement of capital led significantly to the development of scientific research centers and universities (Slaughter and Leslie, 1997). Technological advance has been remarkable, and based on scientific findings, new research directions have been developed (Veblen, 2007) and also, new cultural trends (Veblen, 2005). Between the boundaries of innovation under capitalism, there are many factors that favor initially the development of new products, but have negative implications in terms of business ethics (Dubinsky and Loken, 1989). Thus, the right of private property has made it possible that under various reasons, a company may buy the patents of extraordinary inventions, just not to allow the competition to have access to new discoveries (Slater, 2003). This way was preferred too, when the new discoveries put in difficulty the current work of the companies, and thus, by purchasing a patent of a highly advanced technological breakthrough, they could extend the life of their products on the market (Paine, 2006). However competition between companies has also led to the formation of a competition among employees for job vacancies (Einstein, 1951) and thus employees

were forced to abandon their creative and innovative abilities, while accepting positions that have not given them the chance to truly express their potential.

Socialism unlike other political systems, was based on rigorous economic planning (Schumpeter, 2013). Innovation can be planned too, but to a very limited extent, since you cannot predict the components needed to achieve previously undefined results (Kotz et al., 2002). Innovation through its nature is unpredictable. Through innovation planning process it can only be ensured the conditions and premises that efforts will be made that helps develop new results, but cannot predict these results, which often have special requirements and needs (Kotz et al., 2002). In socialism, due to economic centralization, parallel research conducted in the same area by different companies or institutions is eliminated. The information is available to all researchers, which from this point of view affiliate to the specific of open innovation type of work (Enkel et al., 2009, Onișor, 2014, Roper and Xia, 2014). The difficulty of inventors to work according to the principles of open innovation (Onișor and Drăniceanu, 2014), is further enhanced by theorists who believe that the rapid adoption of new discoveries, could lead to major social crises caused by human activity replacement by robotic machines (Keynes, 1933, Brynjolfsson and McAfee, 2012). Innovation is seen as an element to be managed in the interest of all members of human society (Engels, 1910), for multilateral human development and rational use of natural resources (Marx, 1904).

Theoretical political systems (Zapata-Barrero, 2004) to alter and replace both capitalism and socialism (Einstein et al., 1954), have been designed so as to take only the good parts of each (Einstein, 1951). Innovation has been subject to several economic and social modeling processes (Veblen, 1898) in an attempt to adopt beneficial measures to society (Smith, 1979). Thus emerged the concept of democratic socialism or social democracy (Smith, 2012). Based on new concepts and development of communication means, mainly favored by the emergence of the Internet network (Berners-Lee et al., 2000), current society is flooded with information (Atkinson, 2013). At the basis of this new form of organization, Knowledge Based Society, it is information itself (Tarafdar et al., 2013). Digitization of economy (Atkinson et al., 2015) and of all sciences, increased access to information (Rieland, 2012), which for inventors nowadays translates into a more accessible way to access the information gathered so far by humanity (McCandless, 2012, Bennett, 2012).

#### **4. Innovation**

An invention sent for analysis to different specialists, lead to outline at least as many innovations as the number of specialists, if not even more. A series of rapid business innovation, on account of an invention, fall within the sensitive changes of operating parameters (English, 2013). Innovation is greatly enhanced by marketing (Bodell and Earle, 2004), the science of marketing being one integrative, and through its instruments, helps the working of some very different specialists and thus default to the increase both the number of innovations and the degree of their complexity (Onișor, 2014). Permanent integration of new technologies and adaptation to ephemeral concerns of consumers, are items that are permanently taken into account by the marketing people (Bhattacharya, 2008). Innovations developed, should be presented and communicated to consumers in a certain way (Pitt and McCarthy, 2008) and otherwise to specialists in related fields, liaising with both categories being essential (McDonagh and Formosa, 2011). Marketing can use concepts from other areas to form new directions of action (Langdon et al., 2010) in order to increase innovation accessibility (Kimmel, 2013). The path that follows innovation is influenced by three categories of difficulties: technical, financial and of the image. Technological instability is given by the fluctuating nature of the rate of finding solutions by researchers. Attraction of financial resources from investors and collaborators (Gomes-Casseres, 1987), was and remains one of the thorniest aspects of the research focused on the development of new products. However, innovative means of financing have been developed in the financial field. A fine working example is the creation of sovereign wealth funds (Drăniceanu et al., 2014), which use financial resources resulting from non-renewable exploitation of natural resources, in the development of new sustainable solutions which can no longer depend on these natural resources in the future. In relation to these two difficulties, the biggest problem may face a business is that of stability factors affecting the image the company (De Mooij, 2011). Development of innovation creates separate markets both for consumers but also for those which specialize to innovate on a certain ranges of innovation (Tarafdar et al., 2013). Diffusion of innovations in numerous inventions involves the use of own resources but also by combining the acquisition of external capacity (Figueiredo, 2013). Moving

from conceptualization through development and then implementation, an innovation can be achieved faster with external input, in order to take advantage of maximum efficiency and at the same time to manage effectively all stages required for placing products on the market (Lee et al., 2008). Vertically developed relationships become very important throughout the process through which innovations are passing (Delgado-Verde et al., 2014), from design to implementation, to the distribution to consumers. The commercial success of innovation depends on a clear vision of marketing from the placing products on the market up to the replacements with new innovations (De Marez and Verleye, 2004).

In marketing, vertical collaborations have led to their integration under the name of "management of relations with customers and suppliers," and these relations, developed both upstream and downstream have gained such importance (Delgado-Verde et al., 2014), as businesses shape their activity after these connections. Marketing and innovation (Maciariello, 2009) can be regarded as two basic functions of conducting any business activities. Innovation determines the position in which a company or even a country sits at any given time in any classification (Allard et al., 2012).

### **5. European policy for the development of innovation-overview**

In Europe, have been developed several programs for managing innovation. The European Union's framework Programmes have always targeted to facilitate transnational collaborations in scientific research and development (Titze and Brachert, 2014). Cooperation between companies of different Member States, which complement each other in the process of research development, favoring the parties involved, in the sense that it may remain competitive without allocate financial resources to develop the necessary competencies individually (Brunow and Nafts, 2013). European cohesion policy requires joint management of funds dedicated to innovation. On the priority axis of the operational Programme of Innovation in the economy 2007-2013 has been conducted a survey (Knap et al., 2013) on the results of the 81 projects implemented. Nearly half of these have resulted in the development of innovations, followed at a small difference in the projects which have helped to develop the capacities of adaptation or imitation of activity undertaken by competing firms, and to a much lesser extent were obtained for radical innovations or inventions. Other studies (Le and Le Van, 2014) emphasize connection between increasing rate of innovation within a company if where shall be ensured clear market openings for potential products to be researched and brought on the market. Changes in world economy due to financial difficulties which have arisen in the year 2008, have affected all European policies and plans drawn up to that date (Guarini et al., 2014). Rapid changes and the uncertainty future have led to draw up programs to ensure business continuity (Zapata-Barrero, 2004). European political Programmes relating to innovation, tries to quantify and support those directions for action that will prevail in years to come. For the next horizon, the Europe 2020 program (Europeană, 2010) attaches great importance to innovation, innovation being the first of the seven strategic initiatives which have led to the draft program (Antonescu, 2013).

### **6. The need to adopt innovations**

If we refer only to a few inventions and innovations developed over time on the territory within the territory of our country by the Romanian inventors, we can understand that there is really a necessity to adopt new ideas and innovations arising in respect thereof.

In the medical field, we can talk about the great personalities of the Romanian people who have made impressive scientific discoveries. In the first place, professor Nicolae Constantin Paulescu (Țarălungă, 2011), the true inventor of the principle of obtaining artificially the "Pancreine" (substance called later "Insulin" ), managed to make public the results of his research, but did not have the support needed to establish a production line for this. However, the scientific world was opening up to take his idea and produce this substance, which has saved and continuously saves countless human lives. Another great Romanian inventor was Ana Aslan (Țarălungă, 2011). Physician, professor, researcher, has developed a series of substances under generic name of "Gerovital" and well-established in the scientific world as „Vitamin H3”, component with significant role in reducing the aging of human body cells. She was the promoter of Gerontology and Geriatrics clinics, being the founder of the first clinic of its kind in the world in the early 1950s. The scientific world was opened to her research and by disseminating, made known her discoveries in all corners of the world. Thus, the clinic in Bucharest - Otopeni was visited by many personalities from the 50s - 80s (Caplea, 2012): Charles de Gaulle, Josip Broz Tito, Nikita Serghievici

Hrușcirov, John Fitzgerald Kennedy, Indira Gandhi, Marlene Dietrich, Charlie Chaplin, Salvador Dalí, Kirk Douglas, Daniel Swarovski and many others. Patents for invention in more than 30 countries have protected “Gerovital”. After leaving this life, everything that Professor Ana Aslan has built, went into obscurity, and after the political changes in the '89-'90, at European level, has been stopped the allocated funds even for routine maintenance of the Geriatric Institute and no investments have been made at all in the modernization of the Center. Professor Ștefan Ionescu Călinești, in search of a skin treatment for a member of his family, was able to synthesize a sapropelic extract, originally from the Amara Lake mud, Ialomița County, then from White Pond Lake (Hepites, 1900), Brăila County, Romania. The substance was named “Pell-Amar” peloid (mud) and bitter (by Amara). Based on this discovery, he managed to develop a production line of therapeutic and cosmetic products. Products made, thanks to the proven beneficial effects have begun to have a great demand, especially for export. After the changes of 1989, the production line was shut down and everything was left in neglect, losing that way a market with tremendous growth potential. From 2010, a private investor was able to recover some of the facilities, in accordance with the new legal provisions in force and begins production. However, up to the year 2015 has not yet been able to produce the full range of products as in the past. Professor Vasile Boici has developed another extract with outstanding properties to treat rheumatism under the name of “Boicil”. The substance was produced by two factories producing medicines in Timisoara and Cluj, whose owners after privatization, no longer wanted to continue production.

If you change the coordinates and choose other fields of activity, we find distinguished Romanian inventors whose inventions have changed radically and totally how humanity carry out its work before the implementation of their inventions. Petrache Poenaru (Țarălungă, 2011), a professional scholar, invented the pen and patented his discovery in Paris in 1827 (Piouffre, 2013). Traian Vuia, engineer and aviator, he was the first man who conceived a flying machine with its own propulsion and flew with it in 1906 (Lipovan, 2002). Henri Marie Coandă, inventor of the Jet engine without propellers in 1910, and the world's first aerodynamic train (Coman, 2007). Aurel Vlaicu, engineer, inventor, and pioneer of Romanian and worldwide aviation (Baciu and Baciu, 1991). Nikola Tesla, istro-Romanian, considered by many as the greatest inventor of modern times (Hunt and Draper, 1964, Tesla and Childress, 1993, Seifer, 1998), invented and has been able to imagine things that even today after more than 70 years after his departure from this life are hard to understand by the contemporary researchers (Martin, 1894, O'Neill, 2007).

All of those inventors have had intense concerns also in other areas than those set out above. Ideas exists, invention patents have been obtained, their usefulness has been proven, but after a while, as a rule, a general rule once the termination of life of inventors, there are no people and financial resources for the perpetuation of such useful innovations and inventions. Therefore, the need of adoption of inventions that have been proven advantages of using is of prime importance in developing human society. It is a pity not to use the results of such research ancestors and not to build on them further research. Search for answers to some questions that have already been answered, only to maintain a situation of stagnation and non-constructive organic development. How many inventions are not yet implemented, although there have been discovered for a long time and would be able to improve and contribute to the substantial increase in the quality of life level? It takes all these inventions especially since most of them have proven their qualities and their potential and potential of marketing science, and can help in this regard, to their reviving.

The accelerated speed of advances in the economic life, social and political at present time, has resulted in the formation of new practical current that aligns all the actors concerned, from the consumers to traders or brokers, producers and up to legislators. A current in today's business model is based on open innovation adoption, which is considered to be the new form of top-up on the market of new findings in a timely manner (Onișor, 2014). Marketing, one of the youngest science, has its intrinsic nature to bring about major changes in all areas of activity. This ability of marketing to optimize and restructure fundamentally any other science with whom interfere, brought benefits in the fields of inventions and innovations, too. Companies that have research and development departments and are used to develop new products and services through their own efforts, are starting to lose market shares held for a long time, due to the lengthy time to market new discoveries. Turning back to research and development, but by integrating ideas or solutions developed outside the company, firms are able to improve their performance in at least three directions: (1) is reduced time to market of new products; (2) they are able to compete and to maintain or even increase its market shares; (3) significantly increase their profits. Marketing research done with rigor

and constant frequency, identify consumer preferences and reveal trends that will be occurring in the near and distant future, on the market.

### **7. Legal framework for the placing on the market of innovative technologies**

Innovations have always been related to or influenced by the legal component, in the sense that an invention can bring profit to the inventor, only once it is patented and certified by a body which deals with this activity. They are thus, laid down the copyright to the first person who submits all complete documentation relating to the discovery, to an office of certification of inventions and innovation. Innovation, viewed in legal terms, is primarily treated from the perspective of that the company introducing brand new products on the market, can take over the whole market of several existing products at a time and can hold a monopoly for a period necessary for competitors to come up with products that can compete with the newly introduced ones (Graef et al., 2014). Monopoly can be obtained relatively easily, if companies that are more specialized merge to develop innovations easier. Secondly, innovation can result in the creation of new markets that do not exist, and so it is necessary to develop a legislation to be adopted for these markets, with a view to quantifying and application of common standards. Are then envisaged licensing contracts, as a result of which, companies licensed can develop their own technologies which will over time replace technology for which it has obtained license. Small steps innovation is best seen from the point of view of the legislature, while radical innovation requires an enhanced analysis for determination of the criteria for the carrying out of fair competition. Any business that wishes to remain on the market must develop and improve its products or services constantly. Most of the times they opt for minor innovations and slight successive improvements of the product. These innovations are subject to the legislation governing relations between manufacturers, distributors and final consumers, without requiring any special treatment (Beck et al., 2014). Companies, however, can opt for product development based on radical innovation. The risks they take are higher in commercial terms, but may face also problems in legal terms. New products launched on the market in this case, will be initially subject to existing legal provisions for products that are closest to the utility. The law is further amended in such a way that they can cover the full operating range of the products coming from radical innovation processes (Beck et al., 2014).

Viewed from the perspective of marketing, marketing tools helps ease the whole process of granting patents, patents, trademarks and copyright. This approach has emerged as a necessity, after comparison methodologies followed and used by the main institutions involved in patentability of inventions worldwide. Especially because the legislation is always formed post innovation, in some cases may also represent a serious barrier in the way of innovation reaching the market in a shorter time horizon.

### **8. Conclusions**

Marketing, the science that makes it possible to identify, due to research, the latest trends in the market, it can guide a company through the whole process of innovation. Following the presentation in marketing vision, based on a documentary study of differences that exist between inventions, scientific discoveries and innovations, the article presents how each of these ways of bringing innovations to market, affects how companies acts on the market. Also were shown the advantages and difficulties that have characterized business in historical perspective during feudalism, communism, capitalism and knowledge-based society. Have been reviewed current development directions envisaged at European level and the legal issues facing business involved in bringing on the market of very new products.

Companies, which have based their work on innovations, may impose a sustainable economic growth by influencing other industries or through the creation of new jobs in the new sectors of activity, which were set up as a result of discoveries carried out. Innovations can trigger the development of niche markets and socioeconomic growth overall. Development of trade and economic growth and the emergence of niche markets, could lead all to the development of new industries. These new industries can contribute very much, on the one hand to the economic development of a country, but with built-in risks connected to dismantle other older industries and can contribute to this effect, on the other hand, to the rise of the unemployment rate. By using marketing techniques throughout the process of bringing to market new discoveries, the companies are identifying the latest opportunities for their customers who wish to benefit and, in so doing, they import innovations developed outside the company and adjusts its own findings with them, the result being beneficial for both companies and final consumers.

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