

THE PLACE AND ROLE OF INTELLECTUAL PROPERTY POLICIES IN AN ADVANCED SCIENTIFIC RESEARCH AND EDUCATION UNIVERSITY

Mihail Aurel ȚÎȚU*, Constantin OPREAN*, Sebastian STAN*, Ștefan ȚÎȚU**

*"Lucian Blaga" University of Sibiu, Romania

***"Iuliu Hașeganu" University of Medicine and Pharmacy Cluj Napoca, Romania

mihail.titu@ulbsibiu.ro; constantin.oprean@ulbsibiu.ro;

sebastian.stan@ulbsibiu.ro; stefan.titu@gmail.com

Abstract: *Intellectual property plays an important role in the sustainable development of an university. Nowadays we can not talk about economic growth respectively about innovation and technology transfer if there is no analysis regarding the place and role of intellectual property protection in universities done. In this context, the authors conducted a study and have expressed a view on how the Intellectual Property policies must be understood and implemented later in an advanced scientific research and education university.*

Keywords: Intellectual Property Policies, Intangible Assets, Universities, knowledge based societies, intellectual capital

1. Introduction

In the long run, the competitiveness of an economy depends on the innovative potential won through the valorification process of intellectual property rights. But we can talk about this only in the context where there is a solid education in the field of intellectual property. The Romanian economy in the process of "transition" stabilizing the macroeconomic framework requires, in such a way as to be able to address all relevant aspects and needed restructuring and modernization of the Romanian society. Considering the current situation, the only way to ensure economic development and to create prerequisites for increasing the competitiveness of national industry is by applying the model of development based on innovation and one of the central strategic elements should be an educational system. In this way will be created a framework in which well-being will be a constant that will last in the long term.

Industrial countries' history has shown that the success of an economy at the macroeconomic level, depends on development of the innovation process, and the practice confirmed that in order to promote a process of innovation at the national level it requires more knowledge, applied science, embodied in the new technologies, new products and services, a new form of presentation of new products, a new functional structure, a new organisational form, new management methods and organization of education. In short to develop on the basis of creative efforts, a process leading to innovation: creating value by knowledge valorification. So, the main role of the organizations is represented by protection and integration of specialized knowledge

To develop innovations, the national economy must be prepared to encourage creative activity, economic exchanges with not only new products and services but also new ideas, new results of innovative

activity. All the stakeholders must be within the innovation chain that facilitates the creation of new jobs, new products and services that facilitate the conditions for increasing well-being.

Conditions for increase in wealth are created also by public funds. Looking at the national reports we can say that the largest amounts were received by the governmental sector (66.0%), followed by higher educational entities (17.3%). Sources of funding for research and development activity from abroad have been targeted mostly to the business sector (52.6%), higher education sector (26.0%) and government sector (20.9%). This highlights the fact that the higher education sector units have received the smallest portion of resources from public funds.

2. Intellectual property in Romania. Percepts and personal points of view

The increased interest in protecting intellectual property rights and thus for

innovation can be achieved based on a strategy aimed at making human resource aware about the importance of these issues in relation to the economic development.

In this respect, Romanian Ministry of Education starting with the academic year 2015-2016 proposed the introduction of four new optional disciplines among which include the one called "education for intellectual property rights". It proposes exposure to high school students to the issue of intellectual property rights, involving youth in the development and in the promotion of projects for copyright or other intellectual property rights, preparing high school students for appropriate behaviour in respect to sustainable development [19].

Introduction of at least one teaching specialty disciplines proposes awareness concerning the importance of intellectual property in the current life, with an emphasis on creativity and the development of new technologies (figure 1).

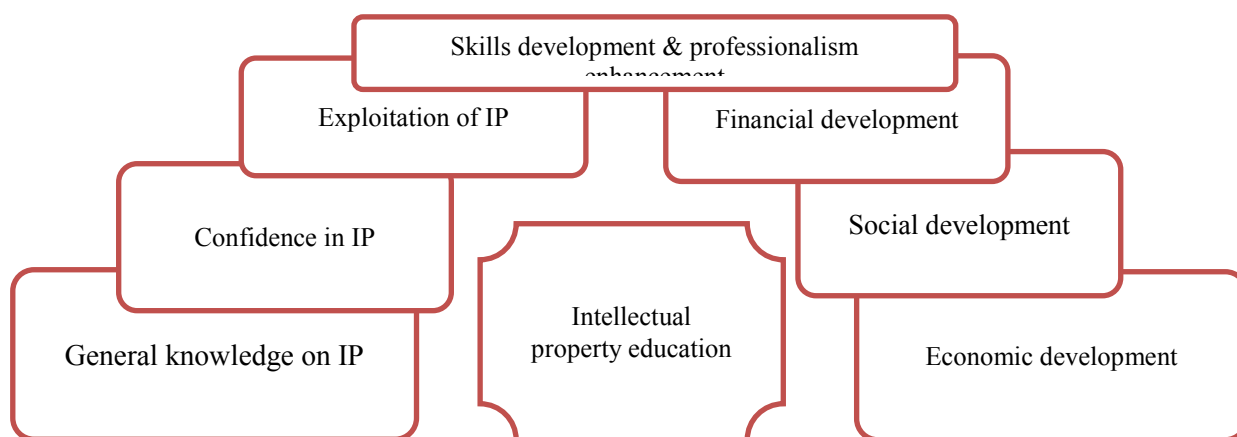


Figure 1: Intellectual property education. Links and correspondences

This academic discipline in the University match the context in which the European Commission encourages the promotion of the concepts of open education. What is to be analysed and applied carefully in relation to this topic about intellectual property, is that emphasis should be placed on understanding the basic concepts of intellectual property and encourage creativity in direct relationship with the

digital world of today. This means the inclusion of all models that are built on intellectual property in the modern world, Internet world, including unlimited free licenses and access to resources.

Beyond this action that implies the introduction of at least one academic disciplines related to intellectual property, at Romanian level, there were other initiatives to enhance the role of intellectual

property in the development of the nation, for example, OSIM program, "Intellectual Property in universities". But unfortunately, the number of initiatives is one significantly reduced, this having determinant consequences over the long term.

University goals are typically more complex than those of firms. For example, public universities are accountable to a broader range of stakeholders. Public universities typically have less flexible policies than private universities regarding patenting, licensing, the formation of start-up companies, and other interactions with private firms [20]. "Furthermore, public universities may be less focused on technology transfer and commercialization as a source of revenue than private universities. In addition, public universities may have objectives relating to the promotion of local and regional development through IP spill-overs. This last objective leads to a preference for local licensing agreements, perhaps to smaller firms, with a consequent income loss" [29]. Private universities may find it easier to adapt faculty royalty incentives to promote licensing, which may be constrained by political pressures in public universities. An study made by two Americans [24] examine a number of central issues surrounding university patenting and licensing using US data from the Association of University Technology Managers (AUTM), as well as their own surveys. Their identification of a growing trend in patenting and licensing by universities is paralleled elsewhere. In the UK, for example, patents issued by universities increased 59 per cent and new licenses executed increased 39 per cent between 2001 and 2002 [27].

3. Intellectual property policy in universities. Current and future issues

In terms of a country, "intellectual property system is used as a tool for social policy" [16]. Each country should make a choice

and arrangement on public policy, based on its actual situation and future development, for the purpose of answering questions regarding intellectual property, such as whether intellectual property should be protected or not? What should be granted intellectual property? On what level should the intellectual property be protected? Public policy, as a term in the field of policy science, is generally defined as "a course of restriction or guideline chosen by the public decision-making authorities to address a public or private social conduct, for the purpose of realizing the given goal in a certain period of time and in comparison, with policy cost and policy effect. It is generally expressed in the body of laws, rules, regulations, programs, plans, measures, decisions and so on" [28]. This definition shows that intellectual property system is also an intellectual property policy. Substantively speaking, intellectual property policy is made, implemented and initiated in the name of a country. Simply speaking, intellectual property policies refers to the sum of guiding and regulating, utilization and management of knowledge.

The link between universities and industry is complex and comprises various channels of interaction, such as joint research, contracted research (research outsourcing), technological consultation, technology transfer through licensing, academic spinoffs, education and training. From among these vast issues, we will focus on emphasizing the need of implementing intellectual property policies in universities and research centres.

Several studies have investigated the effectiveness of technology transfers by universities and research centres [1], [5], [8], [9], [11], [17], [21], [23], but at Romanian level there is a lack of such initiatives.

"Among these, Siegel et al. (2007) summarize the recent empirical studies on university technology transfer offices and the key factors in their performance, reporting that the performance of a

technology transfer is affected by university characteristics such as ownership (public vs. private), academic quality, the local high-tech demand, and the design of the licensing contract and by research centres characteristics such as size and age. More recently, Caldera and Debande (2010) examine how research centres characteristics affect a university's performance in a technology transfer, controlling for the nature and type of technology transfer and academic quality. Using the survey data on the technology transfer activities of 52 universities in Spain between 2001 and 2005, they find that a university's rules on the conflicts of interests between academic teaching responsibilities and external activities have a positive effect on research and development contracts, licenses, and spin-off creation. Thus, previous empirical studies suggest the importance of intellectual property policy for the performance of technology transfers from universities. However, the effects of university intellectual property policies on the performance have never been explicitly addressed or empirically examined" [30].

"University patenting is not only a small, albeit growing, phenomenon in the patent landscape, it is a growing phenomenon. Only a few countries and a few institutes account for the bulk of university patenting", (figure 2) [31]. "Almost half of all European patent applications came from the European Patent Office member states, followed by the United States, Japan, South Korea and China. Applications from Europe grew modestly overall, with marked differences among the larger economies. The most significant growth came from Italy, the United Kingdom, Spain, the Netherlands and Switzerland. France grew moderately, while Germany and some of the Nordic countries filed fewer applications. The US and China were the main drivers of growth for applications. Growth from South Korea was moderate and Japanese companies filed fewer

applications" [32].

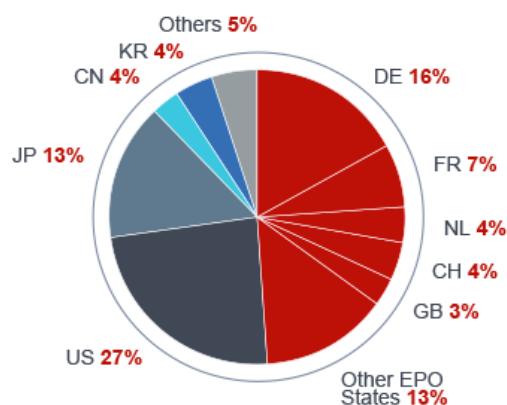


Figure 2: European patent applications

Source: EPO Annual Report 2015

"In the past, the general observation was that many universities and research and development institutions have been "amateur" in their relations with sponsors of research and development activities. One of the reasons for this is that most universities and research and development institutions do not have intellectual property policies in place with which to safeguard their interests in managing collaborative research activities. Particularly sensitive are issues related to ownership, disclosure and the distribution of income in the event of an invention being commercialized.

The aim of this article is to explain the intellectual property policy needs of universities and research and development institutions and to highlight the issues that may be addressed when developing an intellectual property policies" [33].

Intellectual Property is inherent to many of the research and teaching functions of a university or research centres.

A successful research program can generate patentable inventions and other forms of IP. Decisions must be made regarding whether to protect and how to bring those inventions to the next step of development. This, then, raises the question of who the inventors are. There can be different types of people involved in the research. For example, professors, students, visiting scholars, postdocs or research employees.†

The university's teaching activities will also generate intellectual property, such as

teaching materials, theses or articles.

It is generally considered that universities and research centres shall have a priority to serve the public interest by insuring that such intellectual property is transferred and developed or otherwise disseminated for ultimately the benefit of the public, for example in the form of new products, new therapies, new services, environment improvement, job creation, etc.

4. The need to introduce intellectual property in the Romania academic curricula

There are many people who could be involved in the process of commercialization of inventions and the funding of research. Starting with universities as such through their research centres, teachers, researchers and inventors, students, technology transfer, etc. Each of the participants which may be involved in the process of generating and marketing of research results or in the process of obtaining contracts research make a contribution. But, they have their own interests and expectations, a situation which, in the majority of cases, will result in a conflict of interest. It should be noted, however, that a university, as such, is the main participant in the process of research results, as this provides: research infrastructure, staff salary, funds for research, the good name of the institution.

Valorification of intellectual property rights, especially by countries that are in development, it is often correlated with the process of globalization so that it is difficult to identify negative or positive consequences in a given economic system.

The positive effects of the valorification of intellectual property rights may include increased productivity, the development of complementary activities with local firms, while the negative effects may include adverse competitiveness effects in relation to local firms, personnel layoffs and the implications of lowering the welfare.

Must be aware the fact that, in the long

time, the competitiveness of an economy depends on the innovation potential process won through the valorification of intellectual property rights.

Beyond the effects of the globalization process, which relates to foreign direct investment, relocation of production activities, etc., there are deeper causes which determine the evolution of competitiveness, these being correlated with investments in research and exploitation of innovation. As can be seen in figure 3, at European level the number of patent applications are growing which mean that investments in research and development are made.

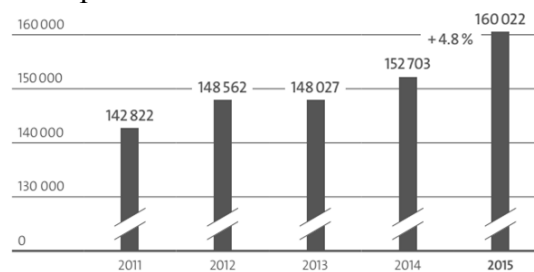


Figure 3: Total European patent applications

Source: Facts and figures 2016,

[http://documents.epo.org/projects/babylon/eponet.nsf/0/defeec4bf6ba1057c1257f69004f13bc/\\$FILE/epo_facts_and_figures_2016_en.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/defeec4bf6ba1057c1257f69004f13bc/$FILE/epo_facts_and_figures_2016_en.pdf)

Taking the example of Finland, the most innovative country in the European Union, we can find that this country has earned this position on account of some massive investment in research and in intellectual property rights (table 1). In just ten years, Finland has increased investment in research up to 3.17% of GDP, which resulted in an increase in the annual rate of growth up to 4.2%. Comparing these figures with what is happening at Romania level, it can be seen that there is still much to be done to reach the level of Finland.

Table 1. Research development expenditure as a percentage of GDP

Year					
Country	2010	2011	2012	2013	2014
Romania	0,45	0,49	0,48	0,39	0,38
Finland	3,73	3,64	3,42	3,3	3,17

Investment in research, development and innovation in valorising intellectual property rights is a key factor determining long-term economic development. Thanks to research and innovation new products and processes that contribute to the overall well-being of a nation are created.

In order to bring economic benefits, have developed various organizational forms of the universities, which include intellectual property offices, technology transfer, licensing, incubation and spin-off.

In principle, universities are required to carry out its mission of education, research and service. But, the purpose and function of the university have always been knowledge and wealth creation for the benefit of the public. This model has evolved to the one which concerns the university as a major player in the economic development process.

More than ever before, universities should be orient to the management of intellectual property and patenting. Thus, maintaining the basic functions of education and theoretical development, they should increase the attention directed to the creation of wealth, not only for society in general, but in particular by generating income for these universities.

Thus, changing the structure and functions of universities has become a crucial necessity in turning the flow of knowledge into new sources of industrial innovation [21].

5. Intellectual property rights, intellectual capital in the context of knowledge-based economy

Innovation is not a process that has a beginning and an end, but this doesn't mean that it shouldn't happen in an organized manner, with a degree of strategy. It must be mentioned that innovation doesn't have an end, there is also an aspect that can bring value, or even a whole new thing that could replace what was there before. "But a defining element for innovation is that it must be tested by a great number of

potential users and this process must have an end and a conclusion as soon as possible in order to evaluate its degree of success or failure" [34]. The failure of an idea doesn't have to demobilize that industrial and health organization but to make it stronger for refining what can offer in the future.

All these lead to a try of quantification of the resources involved in innovation. Even if the creative spirit can't be put into default shapes, the practical and analytical feature of innovation must contain elements and resources of time. That is the reason for what the allocation of budgets can stimulate the innovation showing on this way the importance within the industrial and health organization, but it has to be counterbalanced by emphasizing the results. This thing will show the degree of success of the initiatives that took place and it can be a deciding element in the analysis of the future actions.

The historical moment where we are found is one where no matter the place in the world we are, we are able to access a large amount of information that no human being or a group of people would be capable of processing and remember. But just the information is not enough. For example, to be able to access the data disposed by the internet, a connection to the internet is not enough, it must be known the way of using the computer, what means owning some knowledge. The characteristic of the knowledge based society is not that we have great amount of information but that in this framework we must find out more through the process of their transformation in knowledge (new products, technology, etc) [34].

In spite of the vast amount of research on the topic, there is still no single definition that is universally accepted and applied with some homogeneity in the majority of studies [6], [10], [4], [13], [22], [34]. "Thus, intellectual capital can be defined as the relationships with customers and partners, innovation efforts, the infrastructure of the firm and the knowledge and skill of the

members of the organization. Similarly, Sullivan (1999) indicates that intellectual capital is that knowledge that can be converted into future profits and comprises resources such as ideas, inventions, technologies, designs, processes and informatics programs. Stewart (1991) indicates that intellectual capital is everything that cannot be touched but can earn money for the firm. On the same line, Lev (2001) considers that intangible resources are those that can generate value in the future but have no physical or financial form" [35], [10].

For an organization, the identification and acquisition of resources will be of vital importance to achieving good performance in the long term [12], [3], [15], [18].

Thus, in the last decades the strategic management literature has emphasized the crucial role of intangible factors or the intellectual capital as determinants of business competitiveness. On that line, authors such as Lichtenstein and Brush (2001) find that intangible assets are more important and critical than tangible assets in such a decisive period of the life of a business. Thornhill and Gellatly (2005) found that the investment in intangible assets is associated with a track record of growth [14], [34].

However, one of the main problems of research into this topic is the fact that many organizations do not explicitly recognize their intangible assets and so do not manage them correctly [2], [34]. If, from the moment of the organization's beginning, the managers and owners were aware of the importance of these assets to the short and medium-term performance of the firm and, especially to the long term competitive advantage, the management of these assets would improve, as would the profits they generate, [34].

Intangible assets or intellectual capital are recognized as the most important assets of many of the world's largest and most powerful organizations. These represent the foundation for the market dominance and

continuing profitability.

In addition, it is often the key objective in mergers and acquisitions, and knowledgeable companies are increasingly using licensing routes in order to transfer these assets to low tax jurisdictions [25], [34]. Nevertheless, the role of intangible assets in the industrial and health organizations is insufficiently understood. Accounting standards are generally not helpful in representing the worth of intangible assets in organizations accounts and they are often under-valued, under-managed, or underexploited [26], [34]. Namely, despite the importance and complexity of intangible assets, there is generally little coordination between the different professionals dealing with these relating issues.

All the above leads us to propose the principal objective of this research. Namely, to evaluate the intangible assets that influence the success of the organizations. To that end, we also propose an indicators list in accordance with the fourth categories of intellectual capital most frequently referred to in the literature: human capital, intellectual property, structural capital and relational capital, [34].

Taking into account the above-mentioned theory we can say that, the medical act, seen as an ideal one, represents an activity in the service of some human principles, and its progress could not have been possible without the economic factor. One aspect of fundamental importance is the very relationship between inventions, innovations, medical treatments and laws governing intellectual property rights over them. It is well known that the medical treatments and methods of diagnostics are governed as unpatentable by European laws but the way that they can be recognized is publishing in journals or presentations at national and international congresses or conferences. The decision taken against patenting treatments and methods of diagnostics is based on some arguments

that are more or less founded. A first category of arguments is related to ethical concerns and the various public health policies. On the other hand, it is believed that patenting these innovative treatments could lead to an obstruction of the free flow of information though patenting entails a stronger advertising. Among the arguments for introducing the possibility of patenting methods of treatment and diagnostics, the most important one highlights that the financial rights that are recovered from patenting, will help to cover the costs involved in the discovery of those treatments, while at the same time, having financial possibilities for further research [34].

6. Conclusions

The evidence clearly shows the important role academic research can and does play in economies at wide and for their local economies in particular.

"The pathways through which this contribution materializes are manifold.

Evidence on academic patenting shows a growth over time, but at the same time it shows how concentrated the phenomenon is in few institutions, few technology areas and on few academic patents with high (licensing) value" [36].

Patenting and licensing is only two of a number of pathways for the transfer of knowledge from universities to industry. "Student & researchers' mobility from academic to industry is a critical

mechanism to transfer knowledge from the university to industry, particularly when the knowledge to be transferred is hard to codify and is embodied in human capital" [36].

Research institutions, whether public or private, are endowed for doing research. The primary function of universities, on the other hand, has traditionally been teaching. Yet, universities are increasingly undertaking also research and technology transfer activities.

So, the universities must implement intellectual property policies mainly because this means promoting the scientific investigation and research. Also, it clarifies the way the institution intends to balance the dual goals of disseminating the knowledge created and rewarding and incentivizing those who produce knowledge.

Encourage researchers to consider the global value and the possible opportunities for any new inventions and to increase the potential flow of benefits to society.

Another important aspect is that it provides practical guidance and specific procedures for the identification, evaluation, protection, management and licensing or transfer of IP. It also promotes balanced opportunities for collaboration with the economy and provide researchers with freedom to operate, balancing the various conflicting interests and ensuring the compliance with applicable national laws and regulations.

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