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Universities in the Knowledge Economy

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Abstract. *Throughout this paper, we present the observations and conclusions of our research that is both conceptual and pragmatic. As the title suggests, our research focuses on the new roles of universities in the knowledge economy. Since their beginning, universities have been scientific, cultural and moral landmarks for society and even today they have the mission of stimulating a social and economic progress in society. We start the presentation of the research by emphasizing the correlations between the new understanding of the knowledge concept and the functioning of the university. We consider that knowledge represents a strategic resource for universities and also the main resource used in all its organizational processes and has great impact on the final products and services that the university delivers for its stakeholders and finally for the whole society. In the second section of the paper we discuss the strategic roles that the universities play in society. Though we consider that the primordial role of the university is to educate students and to contribute to the scientific knowledge of the world, today universities integrate more and diverse responsibilities which represent new dynamics capabilities. Within the third section of the paper we approach the problem of the intellectual capital which we consider also as a strategic component of universities and with great potential for their prosperity. The discussion regarding the impact of the intellectual capital is particularly important due to the presentation of the novel entropic model of intellectual capital. In the final part of the paper we analyze and argue the most recently announced challenges and high perspectives for the universities world-wide and we present our concluding remarks.*

Keywords*: knowledge economy, universities, knowledge strategies, innovation strategies, intellectual capital, an entropic model of intellectual capital.*

Correlations between knowledge and universities

Universities have always been scientific, cultural and moral symbols for social communities. The perspectives, the preoccupations, the activities and the goals of universities have greatly changed in time and thus have their roles and strategies. Nowadays universities are viewed as knowledge providers, as innovation facilitators, as promoters of entrepreneurial talent,

as economic and civic leaders and mostly as knowledge pioneers (Bejinaru & Prelipcean, 2017).

Still today in the society's collective representation, the University is symbolically placed between being a place of worship (like a church) and being a marketplace (a supermarket) (Barnett, 2000). In the light of the first perspective, the university is a temple of knowledge, with often a tower as a focal point. It is usually directed by a Rector, a word that also has a religious meaning. The students are associated to novices who are going to be initiated into the mysteries of knowledge. Professors have the role of priests and teach ex-cathedra. The auditoriums and laboratories are like sanctuaries where the academic researcher gives his life to science. Like religion, "science" is an omnipresent force, alternatively scaring and reassuring, that is invoked and convoked on every occasion (Maret, 2007).

And the second perspective is that universities may be interpreted as "supermarkets". The results of education and scientific services are considered as 'products' which are increasingly 'sold' to a large scale of 'customers'. The knowledge-based economy has opened many market opportunities and universities have been prompt in approaching them. Specialized knowledge is often no longer simply shared free of charge, but turned into a profit opportunity. So the transformation goes like this: the researcher becomes an 'entrepreneur', knowledge becomes a 'product', and the student becomes a 'customer'. This chain has been called by Slaughter & Leslie the "academic capitalism" (Maret, 2007).

The model that a university chooses to follow depends on the institutional core values. During the last two centuries, Western universities have come to share and promote modern values like these: critical inquiry and debate, freedom of speech, education and research to foster progress, preservation of culture and knowledge, and democracy and social equity. But are they still representative nowadays? We cannot decide that for sure but we can definitely see that presently the universities are facing a demand overload due to the multiple requirements (Maret, 2007).

During the historical periods – the universities – registered a series of transformations regarding their conceptual and pragmatic components of their mission. The centrality of universities strengthens with the emergence of the knowledge economy and the knowledge society (Bratianu, 2014). In the knowledge economy, wealth creation is increasingly based on knowledge generation, acquisition, sharing, distribution, transformation, and consumption (Andriessen, 2004; Davenport & Prusak, 2000; Nonaka & Takeuchi, 1995; Stewart, 1997; Sveiby, 1997). "Knowledge is actually recognized as the driver of productivity and competitiveness and

consequently its role in achieving competitive advantage is becoming an increasingly important management issue in all business and non-business sectors" (Viedma & Cabrita, 2012, p.14). In the adaptation process, universities focus mainly on their traditional mission of teaching, learning, and research. Today, society asks much more from universities in terms of their contribution. In this regard, universities have to pay attention to the needs of different categories of stakeholders, like the students and their families, private firms and public institutions, and the community (Prelipcean & Bejinaru, 2016).

To express it more specifically, knowledge becomes a strategic resource (Spender, 2014), and knowledge creation an essential function of the new creating class (Florida, 2002, 2007). Since all main functions of a university are related to knowledge creation, knowledge transfer, knowledge transformation, and knowledge distribution, the university becomes a knowledge-intensive organization with the dominance of intellectual capital over any other form of physical capital (Bratianu, 2014, 2015). The new research on universities reveals the necessity of investigating the intellectual capital and the ways through which academic management can transform its potential into operational added value for the university stakeholders and society.

The dynamic roles of the universities

According to Petrusson (2009), the new dynamic capabilities generating new roles for universities can be illustrated like in Figure1. Nowadays this represents the construction of the university mainly based on the pillars of education, research, and innovation. Once more we would say that the primordial role of the university is to educate students and to contribute to the scientific knowledge of the world. Due to its evolutionary nature, education has led to an evolution in the research domain. Thus the university has now a very well-determined role to deliver research that will actively support industry and society's interests. To continue with the argumentation of the triad, the university holds the responsibility to partake in the creation of business and society's future. And not least the university should partake as a key stakeholder in the development of the arenas for research and innovation (Petrusson, 2009).

As concluded in the British Executive Summary (2009, p.18) of „The future of universities in a knowledge economy" „a strong university system is essential to a country's economic success and the vibrancy and depth of its intellectual and cultural life". Universities embody both our values and our

aspirations. They play a huge role in our communities through the provision of cultural and sporting amenities and in passing on and preserving a set of shared societal values, including tolerance, freedom of expression and civic engagement. They shape how we engage with the rest of Europe and the wider world. At a time when public institutions are under intense criticism, universities have an important role in restoring the standards of our public life and in the renewal of trust in the workings of a democratic society.

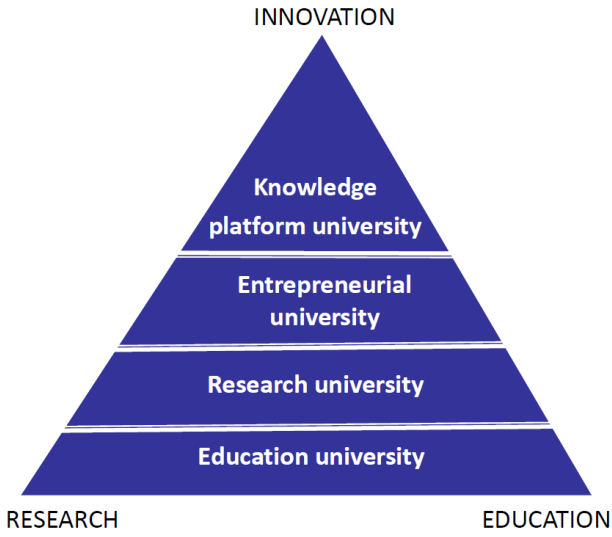

Figure 1. Roles of the University in the Triad education-research-innovation (Petrusson, 2009, p.8)

The fundamental change of the universities' role has been timely stated and approached throughout the World Bank's policy which in the 2002 Report, identified four essential functions of higher education in supporting knowledge-driven economic growth: a) the capacity to train a qualified and adaptable labor force – including high-level scientists, professionals, technicians, teachers for basic and secondary education, as well as future government; b) the capacity to generate new knowledge; c) the capacity to access existing stores of global knowledge and adapt it to local use; and d) the transmission of norms, values, attitudes, and ethics as the foundation of the social capital necessary to construct healthy civil societies and cohesive cultures, which are essentials for better government and political democracy.

Today the role of higher education seems to be even stronger linked to the economic and social modern world. Today the demands from all

stakeholders for quality, robust and diverse systems of higher education are likewise unprecedented regarding the active responsibility in addressing the challenges of the world's pressing issues. "This pressure for global engagement emanates from an equally diverse group of stakeholders: from policymakers, students, parents, academics, social and environmental groups, to lobbyists, inter-governmental, regional and national bodies" (Wells, 2017, p.31). Interconnectivity arises from various sources and focuses on various globally significant issues. For instance, the seventeen Sustainable Development Goals' (SDGs) (presented in Figure 2) adopted at the United Nations in New York in 2015 clearly set out an agenda to address these complexities.

Figure 2. The Seventeen Sustainable Development Goals (United Nations, 2017)

There is a critical role of universities in developing the strategic thinking needed in young minds and researchers to find solutions to the problems facing our world can no longer be undertaken in isolation, but must be approached in ways that cross both institutional and disciplinary boundaries as well as regional and international parameters (Wells, 2017). In order to keep up with these requests, universities must develop innovative study programs and collaborative research agendas.

The university roles spread also towards the social and environmental education area. Scientific research addressing measures to reduce, for example, climate change needs to be accompanied by social science programs that embed Corporate Social Responsibility (CSR) into entrepreneurialism education which can then cascade into responsible enterprise practices; global citizenship education must educate individuals to take personal responsibility for actions to reduce their impact on the planet's ecosystems and natural resources; teacher education programs

must equip the next generation(s) of educators to teach social responsibility to learners from an early age. In this sense universities must provide the Continuing Professional Development (CPD) and lifelong-learning opportunities to up-skill and re-skill professionals – be they educators, policymakers, entrepreneurs or public sector workers – to take a collective stance to protect the world's resources and support global development issues (Cantaragiu, Paunescu & Hadad, 2014; Prelipcean & Bejinaru, 2016; Wells, 2017).

Globalization and internationalization of the university create an unrivaled invitation for learners, scholars, and researchers to pool their collective creativity, knowledge and experiences for a change. The growing number of networks of higher education institutions and collaborative research projects has proven to be the cornerstone for accelerating the move from a fact-finding to solutions building (Wells, 2017). Current demands create pressure for economic growth and socioeconomic development at country and regional levels. In the global sphere, there is a call for universities to engage with the generation of knowledge related to the pressing global issues described in the SDGs. The changing role of universities is reflected in the re-orientation and (changing) purpose of research. There has been a shift towards research focused on business innovation, and the subsequent adoption of principles of responsible research and innovation (RRI) by the European Union that seek to strengthen community research partnership approaches, structures, methods and more. This is both a response to and a driver of change in the research process and practices towards more open models of innovation (Grau, 2017).

Many universities act as economic and civic leaders in their local area. They are in an ideal position to take the lead on significant socio-economic issues at a local level by a) helping to shape local economic strategies, b) linking research and teaching priorities to local economic and social needs; c) promoting public engagement, community well-being, and active citizenship skills (Bejinaru & Prelipcean, 2017). In order to achieve *a socially responsible university*, among the major issues to be addressed, we would like to notice the ones highlighted recently in Grau (2017):

1. The policies and perspectives of higher education for a socially responsible university.
2. The educational and teaching challenges in training highly-qualified professionals who are committed to society. Universities should demonstrate socially responsible management of the environment, energy and sustainable development.
3. The use of information technologies to support the social mission of universities.

4. Improvement of the training of educational and health professionals as an expression of socially responsible universities.
5. Food security: the responsibility of universities towards society within the contemporary context.

The basic feature of a *civic university* should be to integrate education and research processes in order to progress in terms of commitment to the outside world (society). Civic University will produce effects on two levels. The civic research will have an immediate impact on the socio-economic life of the community and through civic education, a strong community involvement will be achieved in the long run. Of course, the progress of such a university depends also on the partnership with the city/community leadership. "If there is weak city leadership, ineffective partnerships and lack of a shared vision, the university may need to take a leadership role and over the long term help other public and private institutions in the city and beyond to build their capacity to absorb knowledge generated within the academy, to co-produce knowledge and articulate knowledge demands. Or to put it another way, to both anchor the university in the city and the city in the university" (Goddard, 2017, p.123).

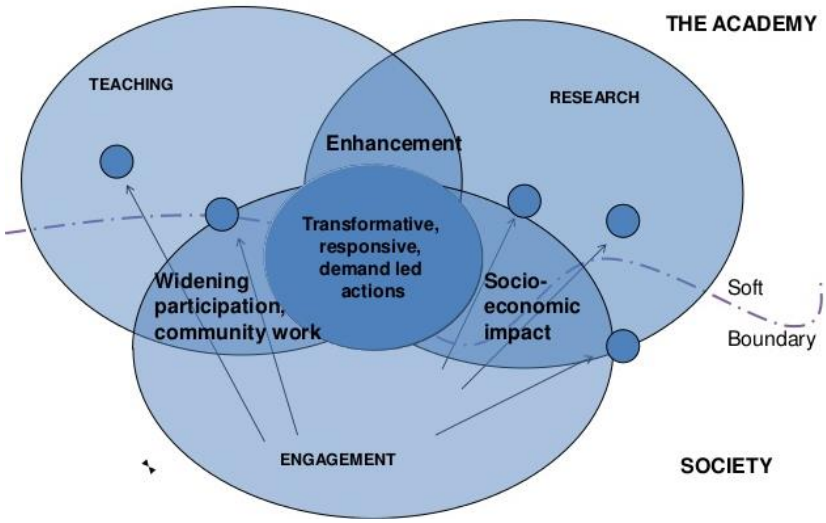

Figure 3. The Civic University (Goddard, 2017, p.124)

In addition to the perspective presented above, the civic university integrates teaching, research, and engagement with the outside world so that each provides enhancement to the other (Figure 3). This picture of the civic university assumes that the research (dimension) has a socio-economic impact designed in from the start and teaching has a strong

community involvement with the long-term objective of widening participation in higher education. Most importantly there is a soft, flexible boundary between the institution and society which should lead to easier mutual access and response. For the purpose of creating a practical way in which institutional leaders and managers can appraise their own organizations there have been identified seven dimensions of the civic university. These dimensions are the following (Goddard, 2017, p.124):
1. It is actively engaged with the wider world as well as the local community of the place in which it is located.
2. It takes a holistic approach to engagement, seeing it as institution-wide activity and not confined to specific individuals or teams.
3. It has a strong sense of place – it recognizes the extent to which its location helps to form its unique identity as an institution.
4. It has a sense of purpose – understanding not just what it is good at, but what it is good for.
5. It is willing to invest in order to have an impact beyond the academy.
6. It is transparent and accountable to its stakeholders and the wider public.
7. It uses innovative methodologies such as social media and team building in its engagement activities with the world at large.

The world, in general, and societies, in particular, are confronted with the process of continual change and have evolved and turned very fast in the last decades into a globalized arena. Universities are going through one of the most interesting periods because globalization involves the chance to take advantage of significant opportunities. However, globalization also brings challenges or even threats to the future. We can take as an example the challenge of 'serving the common good' at a time when what is "common" and what is "good" is difficult to define because of the cultural and social variety. Though we shall conclude that today the role, the mission, the impact or in one word the *expectations* from the universities might be summed up with the formulation "an engine to facilitate knowledge-based development" (Petrusson, 2009).

There is no 'template' path towards success for universities, but rather - an approach - that can bring success and that is, to engage fully. Universities need to exist as benchmarks at the regional level. Universities are expected to be actively and closely involved in the development of the society they are part of, working with authorities and civilian representatives, through the educational act, through research, and through knowledge transfer. Beyond the local and regional level, universities must aspire to become globally active organizations, i.e. to educate citizens with a broad vision, critical spirit and strategic initiative, whose contributions would lead to a just and sustainable world. Therefore, "everything they do it matters!" (Grau, 2017, p.51).

Intellectual capital as a strategic force of universities

We are approaching the issue of intellectual capital because we consider universities as knowledge intensive organizations (Bratianu, Agapie, Orzea & Agoston, 2011) and thus they must carefully manage critical issues like knowledge creation, knowledge acquisition, knowledge transfer, knowledge conversion and also knowledge loss. All these processes must be efficiently managed as they contribute directly to the increase or decrease of the competitive advantage. For instance, we cannot deny the fact that *Churches* and *Universities* are the oldest institutions of society. Even if they changed themselves during their long history, they prove to have an impressive intellectual capital. As long as most universities are public institutions, they should provide full transparency concerning their activities and especially regarding the use of funds received from the government (Bratianu & Bejinaru, 2017). Intellectual capital that has developed (in the past) around an organizational architecture based on a given technology must be constantly adapted to organizational changes to meet (today) aggressions of external factors, thus preventing the dissemination of information and knowledge throughout the new levels of the organization. In this context, intellectual capital becomes the instrument intended to define clear priorities and differentiate the present ones from those of the past and from those of the future of the organization.

Many approaches have been developed for the intellectual capital concept and at this point, we will start with the traditional approach, known also as the canonical model, and compare it to the new paradigm of the entropic intellectual capital in order to make a comparative analysis. The canonical model of intellectual capital is the best known and it bases on the knowledge dynamics paradigm. The argumentation given by Roos, Pike, and Fernström (2005, p.19) is relevant: "*Intellectual capital can be defined as all nonmonetary and nonphysical resources that are fully controlled by the organization and that contributes to the organization's value creation*". The primary structure of the intellectual capital is given by human capital, structural or organizational capital, and customer or relational capital (Andriessen, 2004; Roos et al., 2005; Stewart, 1999). Even if there are different titles for the components of the intellectual capital we should award more attention to clearly range and describe the content of each component of the model. The major problems in the first stages of intellectual capital research came from the fact that most of the researchers used the paradigm of linearity as an extension from the classical economic meaning of the capital although intellectual capital represents the intangibles of an organization which are not linear (Bratianu & Bejinaru, 2017; Bratianu & Vasilache, 2010).

There is no difficulty in observing that in the current knowledge-based economy, intellectual capital has been focused on as the key element for a competitive business. Intellectual capital is consistently viewed as a company's asset such as professional experience, skills, knowledge, organizational structure and routine, and internal and external relationships. The most common intellectual capital framework classified these characteristics into human capital, organizational or structural capital and relational or customer capital as presented in Figure 4 (Bratianu, 2013b; Mazzota & Bronzetti, 2013; Stewart, 1997).

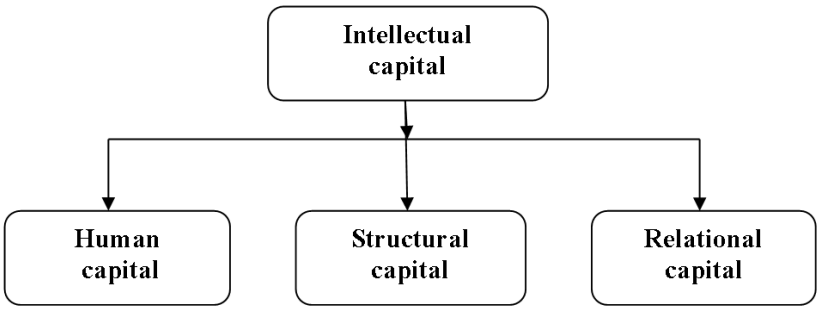

Figure 4. Canonical model of intellectual capital

Based on this approach, *human capital* represents the overall knowledge of all persons working within an organization. A great disadvantage is that this type of knowledge does not remain in the organization when the individuals retire or quit their jobs. Human capital consists of knowledge, skills, and experience of employees and managers. Human capital is the only form of intellectual capital that is able to generate innovation and business strategies. The fact that human capital is not fully controlled by management leads to the necessity of developing stimulating motivational systems for employees to come with new ideas for products and services. *Structural capital*, consist of the stock of knowledge that stays in the organizations in form of tacit and explicit knowledge, that is contained in documents, routines, and organizational culture. In another word, structural capital is a firm's supportive structures for knowledge creation and deployment as well as the set of knowledge, skills, and abilities embedded in the organizational structure (Bontis, 1999; Mazzota & Bronzetti, 2013; Stewart, 1999). *Relational capital* is the source of the reputation, credibility, consent, and image of the organization. Relational capital consists of knowledge resources derived from networks of relationships between peer, customers, suppliers, and business associates. These three new forms of capital capture a company in movement as it transforms its skills and knowledge into competitiveness (Bejinaru, 2016). Therefore, the company needs to keep up and develop the existing capital

structure and also acquire know-how, skills, and professionalism, train and develop employees by emphasizing their business skills and capital to focus on trading and customer (Tennyson, Zhao, and Ordóñez de Pablos, 2013).

Debating on the dynamics of intellectual capital means having an integrated vision for a series of issues. The innovation and development rate is influenced by the intangible aspects that may improve the intellectual capital, all the 'elements' that were built or conceived and that will have an impact on the future value of the organization's intellectual capital. The nature of the organization is to manage valuable knowledge only for itself and the individuals inside. In contrast, the individuals' nature is to adapt their work – of creating knowledge – to the organization's requirements and also resources. The intellectual capital existing inside the organization generates that organization's values, knowledge, and intelligence. "The output of values, of knowledge and intelligence depends greatly on the inputs and the capacity of the organization to integrate all these components in order to generate synergy and performance" (Bejinaru, 2016, pp.525-526).

A basic differentiation or delimitation for considering when evaluating the total intellectual capital of an organization refers to the character of tangibility and intangibility. In order to argue the difference between the perspectives of tangible and intangible resources, we shall present two cases. The first one is based on the research performed by the Autonomous University of Madrid (AUM), as a pilot university in the PRIME Network of Excellence and the Observatory European Universities (OEU). Fifteen universities and research institutes from eight European countries work together during two years "to develop a common framework and build a battery of indicators to measure and compare the intangible elements related to research activities" (Sánchez, Elena, and Castrillo, 2007, p.5). The ICU Report is structured into three main sections containing: 1) the vision and mission of institutions; 2) summary of intangible resources and activities; 3) a system of indicators. These indicators reflect both tangible and intangible resources, financial and non-financial outcomes. That means to introduce descriptive or narrative elements able to explain the non-financial aspects. Implementing this new model of IC reporting lead to the conclusion that there were too many indicators and requirements which made the ICU difficult to be applied and used efficiently for future decision making (Bratianu, 2014; Bratianu & Bejinaru, 2016, 2017).

The second case refers to the implementation of the Bologna process in Austria, in order to accomplish the new legislation of higher education institutions. In February 2006, The Federal Ministry of Education, Science,

and Culture published the 63rd Regulation, on Intellectual Capital report – The Intellectual Capital Act (ICRA). According to ICRA (2006), "The intellectual capital report aims at presenting, evaluating and communicating intangible assets, performance processes and their consequences and services as a qualitative and quantitative basis for generating and entering a performance agreement". What we want to point out is that the evaluation is based on many indicators which reflect both tangible and intangible entities, and a linear logic. That contradicts the very meaning of the intellectual capital that contains only intangible entities and has a nonlinear nature. For instance, in section II.2 Intellectual property – structural capital, there are only indicators for tangible resources expressed in terms of a number of people, financial values and even square meters (Bratianu & Bejinaru, 2017). The described situations show that many researchers do not understand the intangible nature of the intellectual capital and introduced indicators that are appropriate only (or mostly) for tangible resources. In consequence, a linear approach to the intellectual capital will never reflect the whole value of its potential.

In the logic of the canonical model, the contributions of each component are summed up to yield the intellectual capital of the organization. This is a wrong hypothesis since it is based on linearity and intellectual capital is a nonlinear field (Bratianu, 2013a). Instead of summation, we need in this case integration. The original error comes from the mentality that managers can manage only entities that can be measured (Dumay, 2009, 2012; Roos et al., 2005; Sánchez et al., 2007), a mentality built during the industrial management as a result of the scientific principles formulated by Frederick Taylor (Bratianu, 2013b, 2014).

Summarizing, the basic assumptions of the canonical model of the intellectual capital are a) potential value; b) linearity nature; c) reversible processes. The first assumption comes mostly from the metaphor of intellectual capital as stuff (Andriessen, 2008). This suggests that for a given organization the intellectual capital represents "*a sum of everything everybody in a company knows that gives it a competitive edge*" (Stewart, 1999, p.XI). The second assumption has derived from the semantic extension of the economic concept of *capital*. Bratianu (2009, p.417) explains that "*The economic capital is a measurable concept, and it can be expressed in numbers. The easy way to evaluate the source domain is to consider the money metric which means to play with simple numbers*." Thus, *linearity* becomes a dominant property of the metaphor. The third assumption comes from the Newtonian dynamics where processes are considered reversible, which means that time has only a quantitative dimension. The canonical model of the intellectual capital has been of great

value for the domain until now, though at this point it is obsolete and from a certain extent irrelevant within the context of the knowledge economy.

We agree with the hypothesis that the results of the strategies implemented by an organization depend on the decisions taken and they depend to a large extent on the knowledge available to the managers. The more knowledgeable they have, the better they will decide on the future strategies (Davenport & Prusak, 2000). We have noticed that continued research and reflection on these concepts led to enriching knowledge and unraveling their complexity. Bratianu (2013b) proposes a *new dynamic and integrative structure of intellectual capital*. This dynamic model of intellectual capital is based on the multifield theory of organizational knowledge (Bratianu, 2013a, 2015) and it exceeds the limits of the canonical model in order to represent the organization's resources more clearly and without overlapping. This new model proposes as basic components: knowledge, intelligence, and values. The new model introduces the concept of *organizational integrators*, as being driving forces for the process of resources integration. *An integrator* is a force field able to combine two or more elements and obtain results through the synergy effect. The role of an organizational integrator is to turn potential intellectual capital into operational intellectual capital, i.e. to create value for the organization. Organizational integrators are represented in Figure 5.

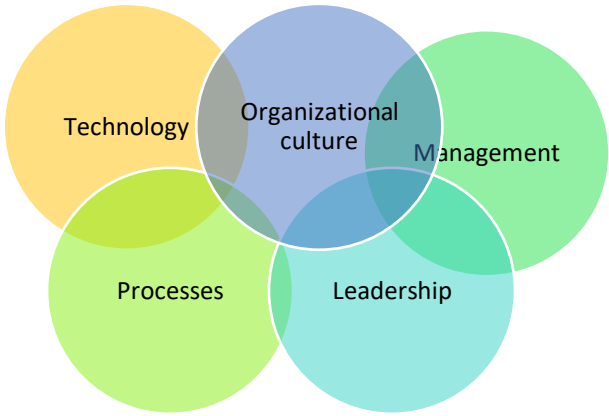

Figure 5. Organizational integrators (Bratianu, 2013b)

Integrators work on organizational resources (through ongoing organizational learning and continuous innovation) generating irreversible processes and effects, which has been called the *entropic model of intellectual capital* (Figure 6). Key processes are organizational learning and innovation that must be integrated and transposed from the individual

(employees) level to the organizational level. Such dynamic intellectual capital models should be applied to create strategies in order to lead to the development of organizations in the knowledge economy.

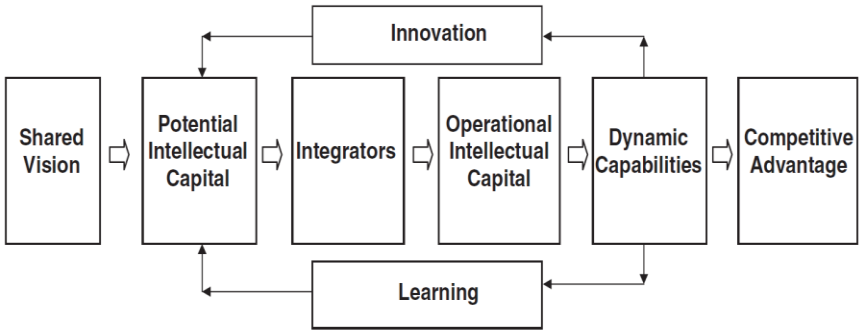

Figure 6. Entropic model of intellectual capital (Bratianu & Orzea, 2013, p.139)

This new paradigm is unique because considers the intellectual capital as conceived in two different instances: as a potential field of intangibles, and as an operational field of intangibles. Metaphorically, this is similar to the mechanical energy that can be either potential or kinetic. The potential energy of a body can be transformed into kinetic energy through the work of the gravity field. In the same way, the potential intellectual capital can be transformed into operational intellectual capital through the work of the organizational fields that are called integrators. The performance of the organization is highly dependent on the operational intellectual capital and not to the potential one. This is the departure point of the new paradigm compared to all the other paradigms developed before. Because it is based on new concepts concerning organizational knowledge and organizational integrators, the entropic intellectual capital model can explain much better the relationship between the intellectual capital and the performance of a company. As Bratianu and Orzea (2013, p.135) remark, "*The entropic model is able to describe and explain complex irreversible processes that are specific to evolving organizations in a strategic perspective. Their evolution is time oriented and driven by the leadership vision. Elaboration and implementation of strategies lead to irreversible changes that aim at achieving a sustainable competitive advantage in a turbulent business environment*." In other words, the increasing rhythm of global changes pushes universities to switch from creating adaptation (adaptive) knowledge to produce generative knowledge. That means for governance to become a strategic driving force of the university and a powerful integrator able to transform efficiently the potential intellectual capital into operational intellectual capital (Bejinaru & Hapenciuc, 2016; Bratianu et al., 2011).

Challenges and perspectives for the universities

The global challenges that universities are expected to face during the next five to ten years are previewed as follows: „Today, universities are simultaneously called on to become more active players in their communities and regions, while at the same time they are responding to being pulled in global directions by the phenomena of global competition. The phrase, *'locally relevant and internationally significant'*, captures a spirit where excellence and engagement are synergistic partners with international quality and visibility" (Gibb, Haskins, Hannon & Robertson, 2012). In order to give their best to the world, universities must find the way of transforming their potential into real results and according to *Times Higher Education* – during the next five years, universities must face the following global challenges:
1. Geopolitical widening of research, because nations are more interested in strengthening their international networks and focusing on strategic interests. In this context, academics must adapt their research in order to provide the requested solutions.
2. National competition for students, this is the challenge that pushes universities to prove the value returned from studying with them.
3. Commercializing core business has become a new role of the higher education institutions due to the context in which they are partnering with business organizations in order to outsource specialized teaching work in order to support companies' growth.
4. Another challenge is imposed by *the reshaping of the workforce* as incumbents are the newcomers and will gradually replace the baby boomers. This fact implies the necessity to attract the most skilled academics able to provide the suitable training for this new generation of students. In order to receive and retain the best professors, universities should also offer a prosperous and generous environment.
5. The *co-creation of new contributions* has become a solution for really challenging issues for the national authorities. National authorities are seeing new limits of their power and the challenge is set by the need to co-create policies with the communities they represent. Much must be done to create more sustainable and equitable societies, looking at disadvantaged groups and also across generations.

In order to face the future challenges are necessary *new styles of leadershi*p. Intellectual and visionary leadership is needed for two major reasons: firstly, to remove ideological barriers associated with the entrepreneurial paradigm and the university concept; and secondly, to carry this through in the particular context of the nature of the university itself and its existing culture, mission, and strategy (Shattock 2009). A key challenge will be to

create entrepreneurial role models within departments and gradually to build a culture of rewarding innovation in every department, rather than a culture of defense. This will demand capacity to identify potential change agents and build teams around them, encourage risk, and protect them. Shared purpose is thus built by example and reward (Gibb et al., 2012). New forms of leadership are required to embrace future challenges. Working up through academic and managerial ranks does not necessarily grow the capabilities needed to respond to mounting expectations of governments, fluctuating requirements of industries or diverse needs of communities. The transparency of academic leadership plays a crucial role in making a good future. To engage best, institutions also need to address their own challenges and take leadership over communicating the value they create. Leadership transparency is no longer an option for the organization but a must. Ensuring transparency for your subordinates and all stakeholders provide a better reciprocal understanding and trust and lead to more efficient cooperation.

Governments, universities, businesses and the general public alike recognize today that higher education has both a special capability and responsibility to make larger social, economic and cultural contributions in the future. In this respect, entrepreneurship and engagement with external parties have advanced to key enablers and drivers of this transition. While the concept of an engaged and entrepreneurial university is certainly not new, today's changing environment finally creates the demand to further explore the concepts and practically implement them on a larger scale. Universities worldwide put significantly higher emphasis on their external relationships and the exploitation of their intellectual resources. These universities are referred to in the literature as 3rd Generation Universities, following the idea that in the past universities were just focused on education (1st Generation Universities) or education and research (2nd Generation Universities). Transforming the higher education system and especially transforming universities, that are not very dynamic by nature, however, is a major and difficult undertaking. In the absence of proven frameworks, good practice examples, tools, and methods, universities need to undertake a journey that requires experimentation and an evidence-based management approach to finding out what works and what doesn't. In addition, becoming a 3rd Generation University cannot be considered as a purely internal challenge (Figure 7).

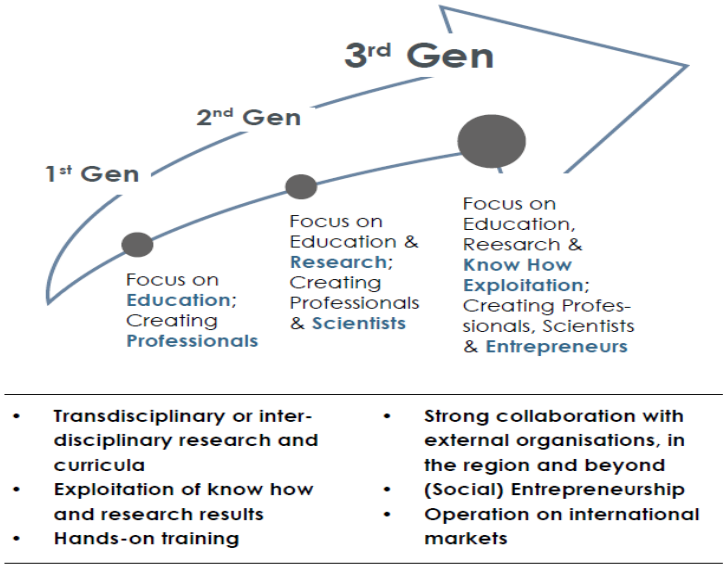

Figure 7. Three generations of universities (Kliewe, 2017)

Even if the stages of becoming a 3rd Generation University are almost obvious the achievement is not guaranteed. Advancing step by step universities have to work on improving their transdisciplinary and interdisciplinary research and curricula; universities have to do better in exploiting the know-how and the research results; universities have to continuously keep strong collaboration with external organizations in the region and beyond; universities must show that they are hard-working on social entrepreneurship; and universities must extend their operation to global markets (Kliewe, 2017).

Concluding remarks

The adaptation process of universities to so many changes in our society means a continuous wondering about what change is, what determines it and which will be its consequences. Change is like a constant since it has always been with us, and it will continue to be involved in the real life of any society. Discussions about change share different perspectives like whether the change is internally determined or environmentally determined. Some authors argue that change should be environmentally determined which means that the factors generating change are external to the system changing. However, change cannot be done if there are not significant internal forces to contribute to that change. Another perspective useful to consider is whether the change is a radical or incremental phenomena. The perspective upon the phenomenon of change is critical in strategic

management and the leadership's vision is regarded as a fundamental capability which is decisive for the success or failure of the organization on a long run (Baesu & Bejinaru, 2013).

Becoming a locally and globally engaged university can be a challenging journey, particularly if the aim is to achieve economic, social and environmental sustainability; universities are often slow to change due to institutional and other barriers and constraints which may be out of their control. Reflecting on the role universities should play in social transformation through social innovation means thinking about how these might intervene so as to ensure that experiments taking place in civil society, understood to include marginalized segments of the population, lead to the transformation of society and end up changing the world (Unger, 2015).

In the knowledge society, knowledge becomes the strategic resource and universities have a significant role in generating, processing and transferring knowledge toward society through many forms. In the same time, knowledge is the essence of the intellectual capital of universities and organizational integrators have the functional role of transforming efficiently its potential into the operational level. Among these integrators, the academic leadership is the most important because it acts on the whole spectrum of rational, emotional and spiritual knowledge. Universities can contribute to knowledge creation to build a more democratic, fairer society in which the recognition of knowledge is not determined by competitive ends, performance, and productivity but by improvement in the quality of the life and work of communities and citizens. This requires continuous attention to new aspirations that emerge in society.

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