Business Systems

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Book Series

SIXTH BUSINESS SYSTEMS LABORATORY INTERNATIONAL SYMPOSIUM 2019

BORDERS WITHOUT BORDERS:

Systemic frameworks and their applications for sustainable well-being in the global era

BOOK OF ABSTRACTS

B.S.LAB
Business Systems Laboratory

ISBN: 9788890824272

UNIVERSITA' DI PAVIA

Dipartimento di Scienze Economiche e Aziendali

BORDERS WITHOUT BORDERS::

Systemic frameworks and their applications for sustainable well-being in the global era

6th Business Systems Laboratory International Symposium

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The book series "Business Systems" publishes research and essays, coming from the scientific and consulting activity of the members of the nonprofit scientific organization Business Systems Laboratory (Italy) as well as from invited well-known scientists in the business systems field.

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The symposium is thought to create a friendly atmosphere among senior scholars, PhD students, researchers and business practitioners.

In particular, the Symposium 2019 focuses on the epistemological, theoretical, methodological, technical and practical contributions that can represent advancements in systemic frameworks and their applications for sustainable well-being in the global era.

While focusing on the Systemic perspective the Symposium is also open to all the scientific approaches in order to foster constructive debates and confrontations to create new perspective of research and practice in the field of business.

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ADVANCEMENTS IN SYSTEMIC THEORIES

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Ab:1

Interactions and conversations in high complexity human activity systems: An Enactive Management Approach

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ABSTRACT:

The dominant paradigm for managing human purposeful activity systems is that human beings have access to objective reality. The cognitive perspective has been questioned as it assumes that reality is independent of the beholder therefore negating the relevance of understanding, perspectives, interests and desires among stakeholders regarding problem situations and organizational viability. Considering the cybernetics approach to management as dealing with complexity, we propose that the cognitive paradigm suppresses the complexity that corresponds to stakeholders diversity bringing high potential damage to organizational viability and sustainability. Additionally, dissatisfaction and pain have been growing among managers responsible for complex systems as theory, methodologies and tools based on the possibility to access objective reality through representation have not measured up to promises and expectations. These are sufficient grounds for developing fresh approaches to management.

Second order cybernetics and enactive situated learning paradigms offer a fresh understanding of the relation of human beings to their social environment. The former establishes the inseparability of the observer and the observed, and the latter that learning and adapting occurs as embodying of experience. Based on these ontological and epistemological insights about human beings we propose a reinterpretation of the management experience.

We present the Enactive Management approach as a different understanding of the management process providing fresh ontological tools and action strategies. The manager, endowed with self-reflective, autonomy and individuation capabilities, designs listening, interactions and conversations that constitute a sense making enactive system to cope with the diversity of observers that characterizes the system he is responsible for. The characterization of the observer

as a set of intertwining domains is the base for designing tools and methodologies. This approach is generated to allows taking care of the diversity of participating observers in a situated situation.

Based on the configurations, tools and strategies of the Enactive Management approach, several aspects related to productivity and performance, trust, and team work are explored in a real case situation.

Keywords: Enactive management, CLEHES learning, Interactions, Nanoidentity.

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AB:2

Digital transformation of management and organisation theory. A systems-theoretical proposal

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EXTENDED ABSTRACT

For all the amazing advances that our theoretical understanding of the digital transformation of management and organization has made in the last decades, there is still as little knowledge on the impact this transformation has on theorizing as there is ambition to digitally transform theories of management and organization. What we see instead is a rapid progress in computational research methods, the primary use of which, however, is the confrontation of traditional theories with ever-bigger data. The standard case of theorizing remains the analogue moderation of dialogues of two or more theorists, preferable in the form of written natural language texts. This results in situations where, for example, digital decision support systems have for decades been standard topics of management and organization theories, whereas they have since been hardly used for theory debugging or design; or where centuries- and millennia-old text forms such as conversation, allegory, and memoir are promoted as promising alternative genres in information systems research (Avital, Mathiassen, & Schultze, 2017), although we know for a long time now that digitization poses a veritable challenge to traditional genres and theories (Askehave & Ellerup, 2005). Theoretical explorations of and études in digital languages would therefore be a worthy challenge.

It is thus by contrast that this contribution seeks to advance not management and organization theories of the digital transformation, but rather the digital transformation of management and organization theories. For example, we may ask whether and how classical and contemporary theories may be translated from natural into programming languages (Roth, 2016, 2017), or how theoretical foundations are challenged by major trends in digital transformation such as the big data revolution (Roth et al., 2017).

Social systems theory presents a prototype of a digitally transformed theory. Niklas Luhmann (1995, 2012, 2013) developed his theory architecture in the formal language environment of George Spencer-Brown's (1979) *Laws of Form*, and a recently discovered 1961 manuscript shows that Spencer-Brown developed these *Laws* as solutions to electronic engineering problems (Roth, 2017). In this sense, social systems theory in general and social systems-theoretical management and organization theory (Luhmann, 2005) in particular do not only theorise digital transformations, but also constitute examples of theories whose architectures are—at least in parts—coded in a digital language. Yet, Luhmann's digital transformations of theory have remained superficial and largely unparalleled in the in the wider social, management, and organization theory communities.

The digital transformation of management and organization theory remains an unresolved issue of theorizing, which is particularly critical in the light of the accelerating digital transformation of research methodologies as well as the corresponding discussions on the obsolescence of theory (Anderson, 2008; Boyd & Crawford, 2012; Kitchin, 2014). The hope that traditional print and pencil theories will survive the digital transformation, and at best require occasional rewrites and resubmissions, therefore, constitutes a considerable risk. This risk will not be managed by yet another golden open access online-first version of a standard theory paper. Rather, the new standard of management and organization theorizing might soon need to be the design of post-literary management and organization theory programmes that are, e.g., designed in computer language or co-created by computers or on social media platforms.

As a first step towards such a digital transformation of management and organization theory, this contribution draws on the above-mentioned, yet unpublished manuscript by George Spencer Brown to exemplarily demonstrate how we could translate figurative book knowledge into computer logic rather than use computers to write or print something on papers. For this to happen, one intermediary step is to understand theories as programmes and think of how they may be transformed into arrangements such as the subsequent C++ poem (Bezzara, 2012):

```
int main()

{

inti=0;

i++;

i--;

return i;

}
```

Conclusion and consequence

There used to be a time when most leaders governed empires although they were illiterate. Today's management and organization theorists are in a similar situation. We are scarcely ever away from keyboard, and yet we use computers mainly to write articles and books not least on computers. We thus resemble illiterates who sing songs about books although they hardly know more about books than what can be read aloud or seen on a few book illustrations. This contribution argues that management and organization theory scholars need to develop the courage and skills to (self-) apply the lead media of the information age in order to shape the digital transformation of research, teaching, and common wisdom on management and organization before other and probably less management-, organization-, and society-focused disciplines or professions do.

Keywords: *Digital transformation, management theory, organization theory, social systems, Laws of Form.*

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Ab.3

The double nature of cooperatives: a systems theory view

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ABSTRACT

Why we can contemplate a sunset? Why our brain is different from the A.I.? The difference between a mechanical automatic choice and a choice with awareness is principally the self-awareness of the system considered about the choice that itself has done. A system can react, hypothesis of mechanical answer, or can be self-aware and react in proactive way. Awareness is a relative concept. Awareness may be focused on an internal state, such as a visceral feeling, or on external events by way of sensory perception. Awareness provides the raw material from which animals develop qualia, or subjective ideas about their experience. Insects have awareness that you are trying to swat them or chase after them. But insects do not have consciousness in the usual sense, because they lack the brain capacity for thought and understanding.

A central element within the theory of autopoiesis is the concept of structural coupling which refers to the relation between systems and their environments. Environmental events can trigger internal processes in an autopoietic system but the concrete processes triggered (and whether any processes are triggered at all) are determined by the structures of the system. A system is said to be structurally coupled to its environment (or other systems in its environment) if its structures are in some way or other "adjusted" to the structures of the environment (or systems in the environment), i.e. if the structures of the system allow for reactions to "important" environmental events. But, what if the coupling could be adaptive and the autopoiesis will be generated by an evolutionary function that determine in autonomous way the "choice"? By Kauffman in the very long period exist a sort of general syntropy that has created step by step by the "next adjacent possible" the life and the universe as we know it.

Normally, for every System A_j exist one poietic application $\mathrm{f_j}$:

$$\forall A_j \ \exists \ \mathrm{f_j} : \mathrm{P}(\mathrm{A_j}) \rightarrow \{0,1\}$$

with $\{0, 1\}$ the dichotomic image of the System A_j under the application f_j.

The possibility to create a meta-autopoietic function ask an internal application g_i related to the influence of the environment B and a generic A_i on A_j as

$$\forall A_j \ \ \exists\, g_i : (B, A_i) \ \rightarrow A_j$$

and the effect of a mutual influence between a subset $C \in B$ and A_i is $\neq 0$, i.e.

$$g_i\left(f^{-1}(C)\right) = 1, \forall\, C \ \in P\left(A_j\right)$$

Consciousness start to be relevant to artificial intelligence (AI), because to most researchers in the field other problems seem more pressing. However, there have been proposals for how consciousness would be accounted for in a complete computational theory of the mind, from theorists such as Dennett, Hofstadter, McCarthy, McDermott, Minsky, Perlis, Sloman, and Smith. One can extract from these speculations a sketch of a theoretical synthesis, according to which consciousness is the property of a system that has virtue of modeling itself as having sensations and making free decisions, self awareness is a derivative quality from consciusness that furthermore. Critics such as Harnad and Searle have not succeeded in demolishing a priori this or any other computational theory, but no such theory can be verified or refuted until and unless AI is successful in finding computational solutions of difficult problems such as vision, language, and locomotion.

Keywords: Complex AI, Autopoiesis, Systemic.

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Ab.4

Crisis in systems thinking

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ABSTRACT

NOTION OF CRISIS

The term **crisis** refers to an event considered as 'time of aggravated and intense difficulty or danger (possibly life threatening), confusing or damaging to the image, reputation of an organisation etc) [added by author]' [Anon., 1994] which is related to terms like : 'Tragedy' and 'search for explanations in an intellectual field' as far as living things in particular humans and 'disaster or disorder' as far as living and inanimate things, are concerned. Either of these precedes the event perceived and then designated as 'crisis'. The two types of terms are related : A tragedy or disaster or search for explanations occurs in the context of a 'normal but potentially problematic scenario' which can bring about a crisis situation. The relation is causal and necessary when they do happen i.e. without tragedy or disaster or search for explanations no crisis can occur but it is not mandatory because the term 'crisis' when an event is labelled as such needs to be arrived at by inspection of the features of a scenario and subsequently interpreted by human observers and be judged as such. Once a crisis is recognised and prevails it can be resolved by crisis management.

CURRENT INTELLECTUAL CRISIS

We are interested in the current intellectual **crisis** which is preceded by **search for explanations**:

AAA. Human intellectual achievements over the millennia have been built on the use of the 'subject – predicate' construct with its diverse manifestations such as natural language, fine and performing arts, conventional science of physics, mysticisms, laws, etc.

First. In this construct the predicate can be expressed predominantly by **qualitative and/or quantitative** properties of aspects of parts of the world in their diverse forms. However, the same parts of the world can be described predominantly by **structural properties** which is the universal **systems thinking** [Korn, 2018]. Currently interest in systems thinking has been greatly increased but without the highly sophisticated and significant theories and other product developed in the field of qualitative and/or quantitative description or **scientific** or artistic or religious and so on, thinking.

Second. Human interest has been concentrating on **products** physical (chair, car, room in a hotel) and mental (book, painting, belief) which exist in their immense variety as a result of human inventiveness, ingenuity and creativity exercised for facilitating survival, convenience, achievement of ambitions, entertainment etc.

X. However, the same products play an essential role in problem solving by their function in resolving **problematic issues** as a part of **consumer systems**, and
Y. They have to be designed, manufactured, assembled and delivered by **production systems**.

Products are of immediate interest to human beings and are engineered. Construction and operation of their producers appear to be **innate** and subject to 'instinctive reasoning' by all living things using their brain/mind and/or a variety of analytical techniques in management and organisations. The configuration of these systems is invariably **purposive** [Korn, 2018]. The scale of construction and operation is immense from production systems like 'fabrication of a walking stick [product]' to 'construction of cars [product]' and consumer systems like 'putting on a shoe [product]' to 'driving a car'. No accepted, comprehensive theory of these systems and products currently exists.

BBB. There is a fundamental divergence between the approaches using qualitative and/or quantitative and structural properties : The former have resulted in **domain** dependent theories, the latter is a universal, domain independent property of all material and non-material objects [Korn, 2018]. The majority of current proponents in the field of systems thinking do not appear to appreciate the significance of this point.

Intellectual crisis is recognised by:

CCC. Perhaps prompted by the kind of discussion as in points AAA. and BBB., a large variety of inspiring, interesting and speculative but confusing views or methods or approaches centred around the single concept of **systems thinking,** have emerged. This has led to fragmentation of this concept. Examples of these are:

Engineering Control Systems Theory [Brown, Campbell, 1948],
Systemic view [Bertalanffy von,1950]
Systems Dynamics [Forrester, 1961],
Soft Systems Methodology [Checkland, 1982],
Viable Systems Model [Beer, 1984],
Use Cases [Bittner, Spence, 2001]
Systems Engineering [Anon, INCOSE, 2004]
Network Representation of Engineering Systems [Korn, 2012]

and a large number of other, methodological and philosophical approaches are described in [Jackson, 2000].

Another sign of crisis in the current intellectual scenario is the number of organisations concerned with aspects of systems thinking such as:

Business Systems Laboratory, Cybernetics Society, International Society of Systems Science, United Kingdom Academy of Information Systems, United Kingdom Systems Society, Operational Research Society, European Union for Systems and so on.

Intellectual crises have occurred in the past. For example, after the Renaissance in conventional science of physics when scientists searched for explanations of phenomena such as the 'nature of heat' and the 'propagation of light in vacuum', they came up with explanatory hypotheses of 'caloric', 'phlogiston' and 'aether' respectively. These terms mean 'caloric and phlogiston = substance which flows from hotter to cooler bodies or released in the course of combustion' and 'aether = substance of medium which allows light to propagate in vacuum'. The inability of scientists to confirm the existence of such substances caused a crisis which was resolved by scientists like Lavoisier, Joule, Carnot and the Michelson – Morley experiment who discovered oxygen, found that heat was equivalent to mechanical energy and established that aether did not exist [Powers, 1982].

RESOLUTION OF THE CURRENT INTELLECTUAL CRISIS

In general, the resolution of an intellectual crisis in the field of conventional science or systems thinking can take place by the invention of a theory which can provide feasible explanatory hypotheses and the models which can execute the explanatory theory at an operational level or acceptably close to it [Korn, 2018]. This can be achieved by **paradigm change** [Kuhn, 1996]. In particular, such a theory should have the **features** as follows. It would have to:

Provide statements which in some respect can be regarded fundamental,
Fit into the general framework of accepted branches of knowledge rather than stand unrelated,
Be using symbols, the theoretical terms, for construction of models which can be related to aspects of a part of the world, the empirical terms, and vice versa, and can be defined in terms of natural language, the **primary model** comprehensible to all,
Generate a domain which is recognised as a set of symbolised entities and leads to a discipline,
Aid problem solving and design or engineering thinking and technology and invention,
Be teachable in class situations,
Affect thinking of people in society if and when passes peer review,
Have high informatic content i.e. precision of its models and cognitive value i.e. can tell something judged significant about parts of the empirical world.

In particular, a structural or systems theory should consist of 'elementary constituents' and rules for constructing a variety of **complex structures** of elementary constituents within the domain. For generality, it would have to:

I. Be able to handle human activity scenarios with components susceptible to emotive pressures, striving to achieve ambitions, beliefs, will etc.
II. Accommodate instances of conventional science at the 'object' level, thus creating a **scientific enterprise [**Korn, 2018].
III. Act as an aid in **design thinking**.

This list is based on familiarity and experience with some parts of human, intellectual endeavour and is likely to be incomplete and debatable.

It is suggested that these features, and/or others, be debated to agree to an acceptable criterion for considering intellectual works. Subsequently, in the light of the resulting criterion attempts at resolution of an intellectual crisis, in particular systems approaches aimed at resolving the current one, be examined and evaluated. Accordingly, the intention of the presentation is to explain further the ideas outlined and to use examples from currently available systems approaches for illustration.

DESCRIPTION OF MENTAL PROCESS FOR SYMBOLIC CONSTRUCTION

The construction of a theoretical framework for description of parts of the empirical world may be seen as a mental process of

'Observation - Construction of thoughts or abstraction - Conversion of thoughts into symbolisms of the 'subject – predicate' form for storage or memory or communication'.

This process can be appreciated better by considering the following notions :

Remark 1. 'Theoretically we can make an infinite number of statements of the 'subject – predicate' form about any part of the world as abstraction of observed, sense data. Complete knowledge is thus impossible. In practice we are satisfied with one or a few statements which are contingent on the perception of aspects of a scenario selected by interest or a point of view and is called a **model'**.

Remark 2. 'Because of the immense diversity and variety of parts of the world, it is impossible to match each instance of this diversity and variety that existed in the past, exists now and will exist in the future to a range of instances of a symbolism selected from those produced by the inventive mind which are necessary for making statements'. For this reason a variety of symbolisms invented by the human intellect, use individual symbols to each of which is assigned a whole range of appearances or phenomena selected on the basis of their similarity in some defined sense'.

Remark 3. 'Any kind of model should be seen as part of a framework of 'principles plus model'. A 'principle' is expressed in abstract, usually linguistic, terms to maintain its generality. A 'model' is usually a detailed symbolic expression with the task of working out particular cases of the 'principle' so that it can be tested for its truth value by exposure to at least thought experiments. Using Popper's phrase : Attempting to falsify the hypothetical principle. Thus, a single instance produced by the model can invalidate or confirm a general statement [Magee, 1985. Korn, 2018]'.

These remarks make human, intellectual constructs or models sensitive to errors and uncertainty at every stage of the mental process and as such can cause misunderstandings, restricted ability of the human mind to comprehend parts of the world to more or less depth and so on.

Keywords: crisis, systems thinking, paradigm change, systems theory, resolution.

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Ab. 5

Boundary Critique and Semi Permeability in Dynamic Organizations

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ABSTRACT

The notion of the formal inquiry into the boundary of a system seems to have its genesis in the paper written in 1970 by C. West Churchman Operations Research as a Profession. Since the publication of that paper the idea of boundary inquiry has been further developed and Churchman's student Werner Ulrich has defined the inquiry as one "as to what 'facts' (observations) and 'norms' (valuation standards) are to be considered relevant and what others are to be left out or considered less important." Ulrich, (2017). From its inception in 1970 the development of the formal inquiry into the boundary of a given system has generally come to be known as Boundary Critique and has been developed by other researchers; Midgley (2000), Yolles (2001).

In the main the inquiry that has been explored through Boundary Critique has been addressed to non-adaptive systems; that is to say systems that are not examined from the aspect of their changing nature over time and through differing iterations of the environment that they exist in. This paper explores the possibility of allowing elements of the systems environment to enter into and modify the existing system to accommodate the nature of change; in that sense it borrows from the social system as argued by Luhmann (1984); however rather than to wait for the environment external to the system to "irritate" (luhmann's term), the system into change; by intentionally allowing elements external to the system to enter into through the Boundary of the system the organization responds not reactively but proactive and is not merely sustainable but reaches the state of flourishing.

The paper surveys the primary literature developing the theory of Boundary Critique and argues that for Boundary Critique to be useful to a dynamic system it must accommodate the nature of the change of the environment that the system exists in; this can be done reactively; in which case the system will continue to operate if it robust or proactively in which case if will do more than to continue to operate, it will flourish.

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Ab. 6

Digital Ecosystem and Social Inclusion of Entrepreneurship and Businesses. Toward the Social Inclusive Digital Society

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ABSTRACT

Since the years 1970-1980, government institutions have introduced different digital systems, information technologies and e-communication systems to computerize administrative processes and procedures. E-government concept has been introduced since the 1990s. It includes the adoption of information technologies and digital systems in internal and external processes and management systems. Since 2010s e-government has begun to penetrate the sphere of entrepreneurs/government interaction.

E-government initiatives and state digital systems have a large potential in business developing and delivering better services for entrepreneurs and in providing possibilities to interact more openly. In addition, digital systems and e-government technology have a large potential to transform government structures and processes [1]. But, unfortunately, we have some of reports on failure of e-government projects. Some authors declare a common collapse of e-government [1]. E-government initiatives success and effectiveness of state digital systems becomes critical to take advantage of their potential. The effectiveness of digital systems and e-governance means that most stakeholder groups (first of all, businesses and entrepreneurs) attain their main goals and do not experience significant undesirable effects and other outcomes. In this context, when we study the degree of satisfaction of entrepreneurs and their opportunities in the field of e-government and digital interaction with the State, we cannot avoid the subjectivity of evaluation. Some authors hold the similar position: there will be subjectivity in identifying such outcomes [2].

During the whole history of eGovernment interests and profits of government has often overshadowed entrepreneurs' interests. eGovernment projects have also focused mainly on technical or technology characteristics but rather little on entrepreneurs' needs.

In this paper authors try to find the answer the question: what criteria can and should be used to evaluate the success of the initiatives of the electronic government in the field of entrepreneurship? How do entrepreneurs evaluate the effectiveness and usefulness of e-

government initiatives? How the business community is integrated into the digital environment and how ready and willing entrepreneurs are to interact with the State through e-government projects. The main goal of this study is to contribute to a better understanding of the criteria used for evaluation of the success of e - government projects. How we should understand these criteria in the context of entrepreneurship and the interaction of the State and business through digital electronic resources? The insufficiency of this issue in the special literature requires a more thorough study in order to improve the efficiency and success of electronic applications and public resources. The clarity of this field will ensure the best interaction between the State and businesses and will contribute to the development of small and medium-sized businesses, as well as optimize the State costs for the development and maintenance of digital applications and websites for entrepreneurs. It will also contribute to the growth of trust in the state by business, which will improve the business environment.

At the same time, the authors studied the social digital integration of entrepreneurs in the digital environment. Social inclusion of entrepreneurship into the digital ecosystem in the conditions of the digital economy development is the most important element and a factor of business efficiency growth, of maintaining the high level of company development and competitive ability growth. Digital technologies are the key factors of interaction with consumers and suppliers of resources, government institutions and other business entities, optimizing the cost of resources, helping to reduce costs and increasing the overall company's profitability. However, the use of information technology does not in itself ensure the social inclusion of entrepreneurs. This fact necessitates deepest study of the social integration of entrepreneurship into the digital ecosystem and the necessity of broader interpretation of the concept of social inclusion/exclusion of entrepreneurship. The using of information technology often causes skepticism among actors, as often the goals are not achieved due to shortcomings in the implementation of the concept of eGovernment.

The main purpose of this paper is to facilitate the entrepreneurs' interests in eGovernment projects. This is done by analyzing and discussing how target groups of State digital resources and platforms (entrepreneurs) use e-government projects, theirs' participation and involvement in the eGovernment projects context.

Thus, the paper is structured as follows:

- The studying of theoretical fundamentals and research in the field of e-government, leading concepts of the authors, investigated the concepts of e-governance efficiency assessment.
- Proposed the author's concept of e-government success assessment.
- Proposed the concept of social inclusion/exclusion of entrepreneurship in the digital environment
- Studying theory and empirical data in the field of e-government efficiency and digital integration of entrepreneurship in Russia.
- Studying and an assessment of the degree of integration of entrepreneurship in the digital environment.
- Recommendations for improvement of e-government projects for entrepreneurs are proposed.
- Some conclusions on the study and proposition of the further research directions in the field of success of e-government projects and the integration of entrepreneurs into the digital environment in order to create an effective digital ecosystem.

Socially Inclusive Model of eGovernance

Socially Inclusive Model of eGovernance – is a model of development and governance in Digital Society for mutually benefits on the part of the state and users (entrepreneurs and citizens). It is aimed at social, cultural, economic and environmental development using information and digital technologies. The model proposed by the authors is based on the following principles:

- Ensuring universal access to information resources and services
- Creating conditions for decision-making in the information digital environment
- Ensuring the participation of target groups in the development and implementation of eGovernment projects in order to respect their interests and goals
- Providing opportunities for everyone
- Using ICT to create an enabling environment for business, equality of opportunity and development
- Participation of the target groups in the implementation of the state program of development of eGovernment, the use of collective decision-making
- Effective information management for the target user group
- Benefit to all sides

Proposed model shifts the focus from the technology and technical means to interaction and creation of opportunities for the aim of increasing the efficiency and development of business to the success growth of eGovernment (see figure 1).

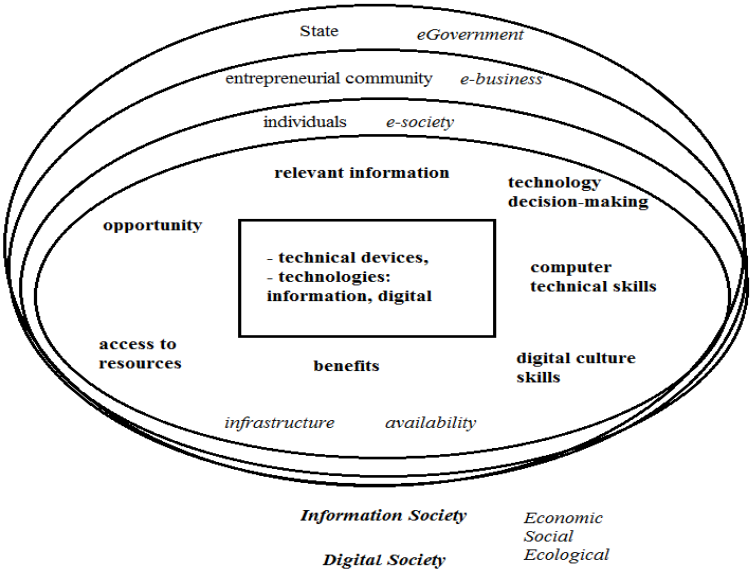

Fig. 1. The Framework of Social Inclusive Digital Society

The systematic implementation of this model will ensure, from the authors ' point of view, synchronized development and sustainability of the interaction between the state and business, as well as the growth of efficiency and success of eGovernment. Our study showed that despite 100% recognition of the importance of information technology for the functioning and development of business, only 30% of the focus group members use eGovernment. At the same time, the level of involvement is very low: entrepreneurs do not influence or participate in the development and implementation of eGovernment projects.

In our research we analyzed the involvement of entrepreneurs in eGovernment projects.

Involvement is a complex task that cannot be solved by technical methods through the dissemination of technology and information technologies. Involvement is a lifestyle where you can no longer live differently. It is obvious that the modern environment of business functioning requires radical regime shift and the development of digital culture among entrepreneurs, providing digital transformation of entrepreneurship. IT-integration of entrepreneurs into the digital environment is implemented through the introduction of modern digital systems, information technologies: it is not just the introduction of IT-applications for the business process. It is comprehensive solution that covers the entire integrated value chain: technologies (websites, digital applications, social networks, etc.).), methods (creating a hype, memes, streams, blogs, etc.).
It is necessary to create a single digital business platform integrated into the digital business ecosystem. If this is not the case, social isolation (exclusion) occurs in the digital environment, as if the company were operating in a parallel reality. Information technologies and digital systems are a tool for social integration of society at different levels:

- Individual
- Socio-political
- Economic
- Cultural

Thus, integration into the digital ecosystem provides entrepreneurs with access to resources: material, intellectual, emotional. It is especially important when using virtual and augmented reality to promoting the product and interacting with contractors. Digital technologies provide access to entrepreneurial activities and the value chain of those social groups who are potentially in social isolation in the "traditional" non-social environment: disabled people, remote partners and consumers, resource providers. However, here is an important point: it is to be able to use them, even when there are these resources and there is access to them. This raises the task of creating and developing digital literacy of the population, entrepreneurs, consumers in the use of information technology and digital platforms, in the improvement of transactions and operations on the Internet, using applications, online platforms, digital payment means, digital technologies in the enterprise, sales technologies and interaction with partners.

Conclusions

The study showed significant gaps between interest and understanding of the importance of the use of information technology and digital solutions by the entrepreneurial community and what the state provides. Until now, the state implements eGovernment projects without direct participation of target users, without taking into account their interests and goals. In fact, the success factor of eGovernment projects is the comfort and convenience of users in obtaining the services of public institutions: since now you do not need to go directly to the state institution and everything can be done in the "one stop" mode, without standing in line and without paperwork. However, this passive role of users may be adequate for a certain category of citizens, but it is impossible for the active part of civil society, which is the business community. Therefore, the main direction of improving the efficiency of eGovernment projects is to expand the range of

issues and problems with collective decision-making and involvement of target users in the development process of eGovernment projects.

We also found out that there is still no understanding of the unity of eGovernment projects for all parties, and that it is necessary to take into account the interests, goals and peculiarities of each. At the same time, it should be remembered that the state acts as a service provider and entrepreneurs as consumers in eGovernment projects. The involvement of the business community in eGovernment projects will have a direct impact on the sustainable development of the state, ensuring effective interaction between the state, business and citizens. Involvement in eGovernment projects is a necessity for modern business, as it ensures social integration into the digital society.

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Ab.7

Sustainable Urban Innovations: Digital Co-Creation in European Living Labs

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ABSTRACT

Urban innovation is a rapidly rising priority for countries everywhere with increasingly urbanized world's population. Public spaces play a vital role in urban democracy and inclusiveness since they enable collective usage and reflection. One of the ways to make the public spaces more attractive and inclusive is the use of innovative digital technologies. The article is a part of the C3PLACES project which focuses on developing the strategies and tools to increase the quality of public open spaces through the use of digital tools by positively influencing co-creation and social cohesion effects.

The goal of the paper is to operationalize previously published digital co-creation assessment framework. The rationalization of the conceptual framework has been presented in previous research works by the research group (www.c3places.eu). The framework has three pillars - (1) Place Attractiveness dimension refers to the factors enhancing social integration and generating pleasure to communities; (2) Digital Inclusiveness dimension explains the technological readiness of the place for enabling co-creation, measures preconditions for the inclusiveness of public open spaces; and (3) Social Responsiveness dimension refers to the factors related to the capacity of co-creative initiative to involve people. Such assessment approach allows the evaluation of digital co-creation initiatives aimed at improvement of public spaces and identify cases that can be potentially transformed into co-creative systems. The elements of the conceptual framework show the conditions, state and dynamics of the co-creation initiatives dependent on the changes of various internal and external parameters. The framework summarizes the current research progress on the topic and condenses the complex and multi-dimensional realities for decision-makers. This paper furthers the research efforts and applies previously published assessment instrument to four cases – Belgium (Ghent Public Space Living Lab), Italy (Milano Living Lab), Lithuania (Vilnius Aukštamiestis Living Lab) and Portugal (Lisbon: Alvalade Living Lab). Living Labs provide a qualified procedural approach to ensure

better social cohesion and the integration various strands of activities, especially when they are supported by making use of advantages and opportunities ICT and their devices offer.

The paper is structured as follows: Section one is the introductory section, in which the main idea of digital co-creation in developing sustainable urban innovations is analyzed. Section two deals with describing the conceptual assessment framework for selected case studies. Section three focuses on methodological issues. Section four describes the results of four case studies. Lastly, the paper synthesizes the research results and identifies further avenues of research pertaining to sustainable urban development, networked innovations to develop inclusive, attractive and responsive public spaces. Such research strategy allows to structure and transfer the research methodologies and Urban Living Labs outcomes into common strategic approach with guidelines for its interlinking into public space planning and design processes.

Mixed-method research approach was employed in collecting data on selected Living Labs. The research group conducted a set of surveys, expert interviews and monitored online platforms to assess the impacts and processes before, during, and after the implementation of cases where co-creation plays a vital role. By testing the evaluation framework on real-life case studies and employing a more quantitative approach to evaluation of co-creative initiatives, the framework is developed into index-based assessment tool.

Keywords: co-creation, urban innovation, digital technologies.

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Ab.8

Analysis of virtual currency systems: drawbacks and solution proposals for improving business confidence

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ABSTRACT

The transactions based on cryptocurrency has had a notable increase in recent years (Vandezande, 2017) based on the advantages it offers such as the independence of a regulatory entity, the low transaction cost, the opportunity to generate innovative business, among others (Mora et al., 2018; Mendoza-Tello et al., 2018).

However, several risks, treats and weaknesses have to be addressed to generate the confidence enough for business and to make a truly monetary system. This paper analyzes the main system vulnerabilities into weaknesses, such as those intrinsic characteristics that penalize virtual currencies, such as the lack of legal support (Choo, 2015), the scalability of the system (Conti et al., 2018) and the advancement of quantum computing (Aggarwal et al., 2017); risks, those direct effects for those who use them, such as those generated by volatility and speculation, trust in exchange sites, management of private keys and wallets (Bhaskar & Chuen, 2015), malicious attacks, and lack of regulation (Motsi-Omoijiade, 2018); and threats, those difficulties that society must face as seen from its financial and government systems, such as the stability of the network and the impact on the traditional monetary system (Baur et al., 2018).

The study also analyzes the consequences of this set of vulnerabilities and how it impacts the ecosystem of cryptocurrencies, this is in the users, the business organizations and the administration. Based on this, it proposes potential solutions to overcome the detected inconveniences and suggests a possible hypothesis or trend in the near future based on the information collected. Finally, the research analyzes and discusses the regulatory perspective that focuses on the control of operations with cryptocurrencies and initiatives to stop illicit activities.

Keywords: Cryptocurrencies, new economy, non-banking systems, Bitcoin attacks, business models, economic policy

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Ab.9

A framework to address the impact of people's behavior in the dissemination of information through mobile social networks

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ABSTRACT

Data dissemination through mobile social networks represents nowadays a matter of great importance. People can communicate by means of their smart devices thanks to short range communication technologies (Blue-tooth, WiFi, etc...). In addition to the loss of efficiency due to both the limited range of communication and the mobility of people [1-3], people's behavior may also reduce the performance of the dissemination of data through networks. Nodes may be selfish, that is to say they are not willing to forward information because of energy consumption. They also can be uninterested and so they discard the message after receiving it or even before [4]. All this damages the entire communication system [5, 6]. Much research has been done to detect and correct the nodes that behave badly in order to promote cooperation schemes to make the networks work accurately [7, 8]. Generally, these approaches are based on epidemic models (SI, SIR, SIS) [9-12] that can be solved by means of Ordinary Differential Equations (ODE), Markovian models or networks [13-15].

Model

Our work addresses the transmission performance of data by means of a discrete space-time framework based on epidemic models that has yet been tested in previous work [16]. The model sorts the nodes into three groups, susceptible, when the nodes are waiting for data, infected, when the nodes have received data and recovered when they have discarded data after receiving them. The cells of a square grid represent the nodes that update by a local binary rule following well-known neighborhoods such as Von Neumann or Moore, or specially tailored such as Diagonal or L (simulating the chess horse jump). The architecture combines a column of grids in order to

model normal performance (implemented by the main grid) and disrupting performance when nodes do not cooperate properly (implemented by the rest of grids coupled with the main grid). The wrong performance is caused by too early recovering of nodes, or by the lack of interest of the nodes to forward data, which are modelled by a mapping of the secondary grids on the main grid.

Main results

Our proposal shows how grid architecture is a valuable tool to model different causes of misfunction of data dissemination, Combining different grids with different neighborhoods and different local rules provides a wide range of possibilities to depict the impact of human awareness and decision on the dissemination of data. We show that the dynamics of dissemination is related to grid parameters such as neighbourhood types, update rules and the delay it takes for a node to go from susceptible to infected, from infected to recovered and from recovered to susceptible again if it were the case, and related also to the mapping frequency of the secondary grids on the main grid.

Conclusion

Our proposal achieves the evaluation of the impact of people's behavior in the dissemination of data through mobile social networks. Our grid architecture provides a suitable approach to incorporate local interactions between nodes which add new features to the main behavioral patterns of the model. We have obtained similar results to those based on traditional ODE epidemic models and we have analyzed the equivalences between the corresponding parameters of the two approaches. As a future work we plan to improve our model. Our next investigation will envisage the modelling of tools to control the failures in the dissemination of data.

Keywords*: Data Dissemination, Mobile Social Networks, Epidemic models, ODE.*

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Ab.10

Platform Business Ecosystems

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ABSTRACT

Business ecosystems continue to advance, becoming the basis of innovative business models. In a digital business ecosystem main economic agents (humans, business and smart things/smart machines) can play any combination of roles, such as customer, partner, supplier, employee or competitor. The systems that support digital businesses require transformation to maximize the economic value of network connections. It forces a shift to platforms and ecosystems collaborative by nature, by applying business models with multiple actors playing multiple roles.

Enterprises that leverage the power of platform business models have grown dramatically in size and scale over the past decade. The rise of platforms as new organizational form is now active in North America, Europe, Asia, Africa and Latin America (Evans, Gawer, 2016). No longer the sole domain of social media, travel, books or music, platform business models have made inroads into transportation, banking and even healthcare and energy (Evans, Gawer, 2016; Yablonsky, 2018-1).

Definition (Teece, 2012).

A business ecosystem contains a number of firms and other institutions that work together to create and sustain new markets and new products. The coevolution of the system is typically reliant on the technological leadership of one or two firms that provide a platform around which other system members, providing inputs and complementary goods, align their investments and strategies.

Business ecosystems consist of organizations and customers working together to create and sustain markets, products and services. The co-evolution of the ecosystem is typically reliant on the technological leadership of one or two firms that provide a platform around, which other system members that provide inputs and complementary goods align their investments and strategies with.

Platform organizations exist in a "business ecosystem" — the network of other organizations that interacts to create shared value (Tiwana, 2014). Teece (2017) mentions that today the concept of "industry" as a group of firms performing similar activities and competing or cooperating with each other is less and less aligned with the way firms think about themselves. In the digital economy, continues Teece (2017), firms see their role less in industries and more in business ecosystems. The platform business ecosystem needs to accommodate new technologies easily as dynamic business capabilities arise.

Our research was motivated by the observation that various descriptions of digital platforms implement the concept of a platform business model on similar core concepts with distinct features. Having a common language in turn makes it easier to visualize digital platforms using a common set of representation techniques. Thus, the purpose of the paper is to analyze different types of ecosystems, clarify the place of ecosystem layer in the platform business model and digital platform stack (Yablonsky, 2018-2), discuss the relationship of different platform stack layers with platform ecosystem(s), present several taxonomy-like ecosystem frameworks for ecosystem typology and analysis, and illustrate how the platform innovative ecosystems can be complemented by the real instances in the global and emerging markets. To achieve the purpose, we first examine several major perspectives from which platform ecosystems have been argued so far and clarify our research position in platform business model science.

For platform business ecosystem we propose a model of value co-creation and value orchestration process, and, then, to argue value orchestration management strategies in terms of them, by referring to recent typical businesses. Finally we propose strategies for integrating firms in platform business ecosystems.

As a first step in platform transformation, companies should align the organization's strategic thinking to the platform concept through an internal digital platform, because the platform shapes the organization's reasoning around the concept of platforms. It will help employees to share best practices across business units, leverage competencies including operational and strategic innovation, achieve rapid prototyping, bring new business capabilities to market more quickly, and coordinate the business ecosystem.

To succeed, organizations must design creative platform business models with related multi-ecosystems design, and create the underpinning operating model. The shift to the business ecosystem is not just another project; it requires a business transformation approach.

At this stage, there are three broad categories of ecosystem types:

- Linear value chain ecosystem orchestrates and optimizes the organization’s value chain. It is a particular favorite type when multiple partners are involved in a complex value chain.
- Platform-led ecosystem mediates the business ecosystem using a platform. One of four styles emerges, depending on the focus of the business ecosystem.
- Decentralized ecosystem is the business ecosystem itself, which defines and mediates the transactions among partners. Cryptocurrencies, such as Bitcoin, are well-known case of decentralized ecosystem.

These ecosystem types have resulted in different types of business models. In the value chain, the business ecosystem opened up the reach and range of value. The business ecosystem provides access to a wider range of partners with complementary capabilities, and the ability to create and coordinate these highly complex, demand-driven supply networks. Each of the three ecosystem types has created its own business model opportunities. These opportunities require a change in perspective, away from a traditional, input/output process to a dynamic ecosystem perspective.

For many organizations, shifting away from value-chain-based business models into the business ecosystem is a big jump. Many organizations have found out that digital innovation is actually not as easy as they had expected. As a result, executives and digital leaders need insight into ecosystem areas. Organizations must develop new ways to model and assess business ecosystems. The enterprise needs to shape its digital business ecosystem to fit the particular needs

of the business. As enterprise reaches out into the business ecosystem, the business models should fit the strategy, style and focus of organization. Otherwise, it will be difficult to get the support and resources needed to pursue the opportunity. For many organizations, platform-based business models are the most appealing, and many successful business models are based on platforms.

The possibilities for creating new, business-ecosystem-based business models are almost endless. So it's helpful to have a small number of good examples to get you thinking. In this research, we present eight examples of business models that leverage the business ecosystem. Four of them are based on collaboration and open innovation, and four are based on a platform. As the examples show, it's possible to begin your journey into business ecosystems simply and with low risk.

For most, this will involve creating new modeling approaches, perhaps including simulation and bringing together multiple perspectives to gain a deeper insight. Platform strategy becomes extremely complex as firms consider dynamic interactions of a multi-layered business ecosystem (Teece, 2012). Designing and assessing an ecosystem business model is now an essential activity for organizations. It will require the creativity to imagine these new business models, as well as the analytical skill to assess the opportunity and viability. This must be combined with the ability to execute these business models by designing and delivering the underlying operating models. This is highly complex in its own right, and will require the right technologies and architecture, people with the right skills and competencies, and a business-transformation-based approach.

The research results are based on the cases from Global and Russian platform ecosystems.

Keywords: *platform, ecosystem, business model, digital transformation.*

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Ab.11

Tear Down these Walls: Towards a Decentralizing Knowledge Management Revolution

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ABSTRACT -

Borders with Borders – The Suffocation of Knowledge Workers and Knowledge Creation
Driven by the forthcoming 'Industrial Internet' and the breakthrough of computerizing non-routine tasks, today's information abundance and work/life-sphere transformations will further accelerate. Due to the lack of personal resilience and support, widening opportunity divides can be expected to emerge as the most crucial impediment to individual and collective development and as an enduring global economic and social challenge. The unsustainable consequences feature within a 'wicked' problem space (ill-defined; incomplete, contradictory, changing requirements; complex interdependencies) inhibiting responses for timely systemic resolutions:
Scholarship may be expected to advance concepts and models, but few ever pass the threshold of impacting organizational or societal reality as a purposeful 'effective theory' in both its utility and communication (O'Raghallaigh, Sammon, and Murphy, 2011). Technology may be thriving in locating vast amounts of digital information but hits a snag affording "effective tools for selecting, structuring, personalizing, and making sense of the digital resources available to us" (Kahle, 2009). Service Providers may successfully engage us in social networking but prefer us as their captured audience by enforcing hostile barriers at the expense of our attention, time, funds, privacy, and potential (Schmitt, 2017d).

The Objective of the BSLAB Paper to be submitted
An idea put forward to overcome the impasse is a decentralizing Knowledge Management (KM) revolution that gives more power and autonomy to individuals and self-organized groups (Levy, 2011). Inspired by the scenario, a design science research (DSR) undertaking-under-way is conceptualizing a Personal KM (PKM) Concept. The objective of this submission is to focus on the criticalities and processes which bridge the conceptual invention of the idea and its marketable diffusion in society. Since a range of multidisciplinary publications have already addressed aspects of the initial and the latter stage, this extended abstract briefly introduces these phases before the envisioned key issues for the BSLAB presentation are outlined.

Conceptual Invention of the Personal Knowledge Management System
The PKM System (PKMS) aims for a novel sustainable intervention to confront opportunity divides by affording individuals the means for life-long-learning, resourcefulness, creative authorship and teamwork and by supporting their role as contributor to and beneficiary of

organizational and societal performances, independent of space (e.g., developed/developing countries), time (e.g., study or career phase), discipline (e.g., natural or social science), or role (e.g., student, professional, or leader). To ensure the 'theory effectiveness' alluded to, it substantiates its:

- Rationale and design decisions against sustainability-related criteria (Schmitt, 2018b) and DSR guidelines (Schmitt, 2016j); the latter offer a roadmap supporting information systems research in creating innovative IT artefacts that improve human and social capacity to attain the impact for which they were contemplated (Hevner et al., 2004).
- Utility concerns by prototyping and integrating a wide range of renowned KM methods and practices (incl. Bush's associative indexing (1945), Usher's cumulative synthesis (1954), Simon's attention management (1971), Dawkins' memes (1975), Nonaka's and Takeuchi's knowledge creation (1995), and Boisot's information space (2004)).
- Communication commitments by disseminating to and receiving feedback from a wide range of multi-disciplinary journal and conference publications covering Knowledge Management and Information Science, Technologies and Innovation, Social Sciences and Management, Human Resource Development and Organizational Change, Higher Education, Sustainable Development, Creativity, Cybernetics, Systems Thinking, and Future Foresight (www.scopus.com/authid/detail.uri?authorId=7006974138 and www.researchgate.net/profile/Ulrich_Schmitt2).

Envisaged Marketable Diffusion in Society

The scope of anticipated outcomes not only allows individuals and institutions to better focus their time and attention on exploiting their knowledge and on its further exploration, it also affords appealing opportunities for stakeholders engaged in the contexts of curation (Schmitt, 2015i), education and research (Schmitt, 2016f; 2015g; Schmitt and Saade, 2017), professional practice (Schmitt, 2015f; 2016d, 2017a; 2018c), development (Schmitt, 2016h), and entrepreneurship (Schmitt, 2018a). While an article-under-review appraises the PKMS's envisaged impact in the market place positively against the concepts and criteria of general-purpose, disruptive, radical, and emergent innovations, another submission has aligned its potentially transformative and game-changing but synergetic affordances to a 'Desirable Sustainability Vision' concept (Wiek and Iwaniec, 2014) to be shared with stakeholders as a prerequisite for creating the respective future PKMS reality.

The Intermediate Stage of PKMS's Systemic Innovation to be focused on in the BSLAB

As a step beyond sustainability, 'thrivability' identifies a concept "in which resilience is achieved within systems and communities" by enabling citizens to "realize their maximal potential and prosperity". It "necessitates – on various scales - new educational orientations encouraging collaboration and cocreation to facilitate the cultivation of collective wisdom and co-developing communities" (Laszlo, Luksha and Karabeg, 2017). However, in our emerging knowledge economies, just memorizing facts no longer provides individual leverage; "the limited resource has become the creative combination, integration, and useful application of knowledge into networked production and customization" (Laszlo, 2018).

The KM revolution (Levy, 2011) fits this 'thrivability' scenario well by being based on a future of decentralized autonomous PKM capacities, networked in continuous feedback loops, nourished by the creative conversation of individuals' PKM devices, enabling the emergence of distributed processes of collective intelligence which in turn feedback to the PKMS community

members to advance their capability endowments via applied learning and self-transcending creative insights (Schmitt, 2018d). Yet, the label of socio-technical systems of shared solutions not only fits the physical and social technologies-under-development but also extends to the envisaged innovative outputs of the PKMS community members utilizing it (as kind of incubator for their shared interests and/or academic/entrepreneurial aspirations).

An early PKMS publication (Schmitt, 2014d) provided a hands-on perspective by utilizing the prototype's workflows to author it for describing the iterative process steps involved in its creation. The intention for the BSLAB presentation and its projected publication is to revisit this constructivist memes-to-knowledge-asset-approach by incorporating PKMS meta-perspectives put forward since and by additionally exploring the commonality between memetic structures, schemas, and pattern languages.

The PKMS's systemic meta-framework (figure) is based on Popper's Three Worlds (1978) and six corresponding ecosystems (knowledge worker, institutions, society, ideosphere, extelligence, and technology) whose boundaries provide memetic gateways between stocks of diverse knowledge types and their flows in enabling KM spaces. Such a 'borders without borders' modus operandi calls for transparently communicating its several synergetic 'grass-roots' advantages:

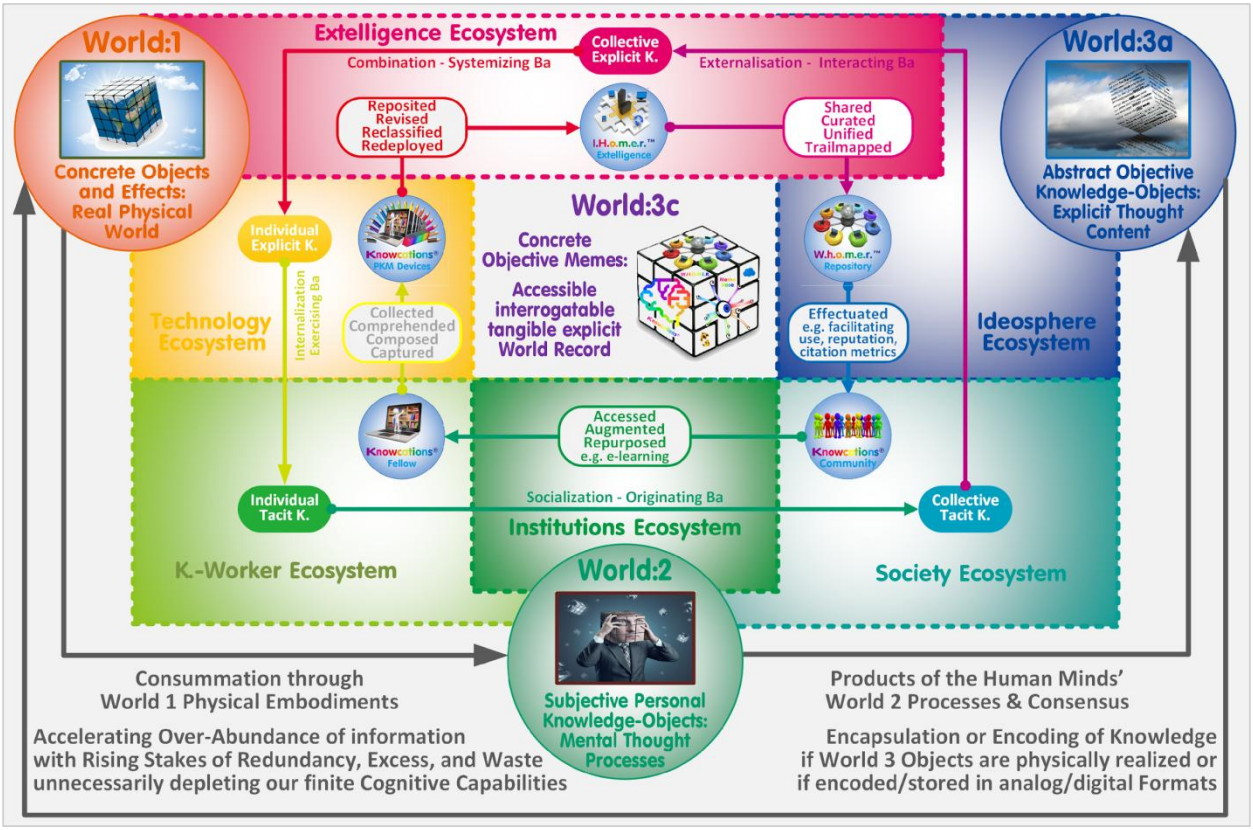

Figure: Popperian Worlds and Digital Ecosystems - PKMS's Borders without Borders

- The PKMS workflows complement the notions of SECI and Ba (Nonaka, Toyama, and Konno, 2000) in order to facilitate a fruitful co-evolution between Personal and Organizational KM Systems.

- The paradigm shift from traditional document-based 'book-age' storage to structurally-referenced-meme-centric 'digital-age' repositories (Signer, 2010) allows for effectively reducing information entropy to focus attention.
- The PKMS's logics and logistics of knowledge formation enable transforming Popper's abstract inaccessible non-interrogatable World Three into a tangible accessible interrogatable knowledge base named 'World Heritage of Memes Repository' (WHOMER).
- While the 'book-age paradigm' compels us to experience our nonlinear holistic world via linear disciplinary-divided fragments, the information-and-trajectory-rich WHOMER matures - with a growing user and shared meme base over time – into a single unified digital library of the world's extelligence - to be accessed, re-purposed, or added to.
  (For example: If sets of memes repurposed in an e-learning's knowledge asset have been studied, they also become 'active' in the learner's PKMS device for utilizing WHOMER's added connectivity, for learning retention, or for repurposing them in assignments or any other aspect of the learner's further career.)
- The educational PKMS concept - as exemplified above - envisages integrating its affordances and KM-related content with an established Learning Management System (LMS). The resulting Personal Learning Environment (PLE) plans utilizing three-dimensional 'borders without borders' topologies as non-linear navigation/interaction spaces to offer learners suitable choices of "where to start and how to proceed, including options to leap into an entirely different course world for a transdisciplinary learning experience in case a LMS unit is shared across these courses, due to its multi-disciplinary relevance" (Schmitt, 2018b).

Keywords: Knowledge Management, Personal Knowledge Management, Knowledge Worker, Knowledge Creation, Memes, Innovation, Opportunity Divides, Sustainability, Thrivability.

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Ab.12

Conceptual framework on the transformation of smart factory jobs profile – from skilled to smart workers

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ABSTRACT

The emergence of new technologies, changes in the market, changes in the production paradigm, the evolution of devices, force the production organization to increase flexibility, efficiency (Zhang et al., 2017) and quality (Putman et al., 2017). The fourth industrial revolution, also called Industry 4.0, has brought changes at organizations in organizational processes, methods and structure of employees (Rauch et al., 2018). There was also a demand for a change in business models (Cozmiuc, & Petrison 2018) based on new technologies. The business model, especially for production organizations, includes virtualization and vertical and horizontal integration of the value chain, digital services, digital product transformation, production equipment, production organizations and value chains. There was also a need for a new employee structure, especially with regard to their qualifications. Macurova, Ludvik and Zwakova (2017) point out that the high risk of organizations is the lack of skilled workers who will prepare, implement and use new technologies.

Industry 4.0 brings and will bring production change to manufacturing organizations in addition to changes in technology and organization as regards employees (Morlock et al., 2016). In addition to the positive aspect of Industry 4.0, which represents the effect of value creation and which includes both increasing efficiency and developing new business models, it should be noted that technological changes can also have a negative impact on employment. The challenge in smart factories will be the restructuring of jobs, as some of the less demanding professions will quickly disappear (Kane et al., 2015). Increasing productivity achieved through the use of smart technologies can help to provide jobs and increase consumer demand with additional income

(compensatory effect), but the use of new production technologies and processes can also destroy jobs (redundancy effects). It is relative that job profiles in many jobs will change. This means that important measures will also be needed to transform and adapt in the field of employee education and development.

The main aim of the research is to develop the conceptual framework on the transformation of smart factory jobs profile at smart factories in automotive industry using a qualitative research approach.

To gain insight into transformation of smart factory jobs profile, we studied organizations involved in automotive industry in Slovenia. We conducted an inductive qualitative study in order to gain new insights and build novel conceptual framework.

Research question of our study is: How will jobs be restructured at smart factories in automotive industry?

The inductive approach requires the theory to be developed after the data are collected, so the expected cause and effect relations among the variables in the model are not known prior to the data analysis (Saunders, Lewis, & Thornhill, 2009). Qualitative research methods enable in-depth studies of real-world settings and capture of the contextual richness and thick descriptions (Yin, 2011). We structured our analysis by combining the methods of case study and grounded theory for inductive theory building research (Glaser, & Strauss, 1967).

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Ab.13

The cross-border defiance. Seizing leadership between global mindsets and psychological proximity

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ABSTRACT

Modern organizations are facing nowadays dramatic changes and innovation waves that are prone to influence and even determine their evolution in the business environment. Organizations are at the crossroads of external forces and internal shifts, so a proactive attitude and harmonization with the pace of the global market emerge as sine-qua-non conditions to create or preserve the competitive advantage via innovation and structural development (Vătămănescu & Alexandru, 2018). Along with the business environment dynamics, the evolution of the business models applied by modern leaders is enhanced. The leadership model itself is substantively altering, consistent with the challenges of both local and global markets and under the pressure of fierce competition (Vătămănescu, Alexandru & Gorgos, 2014; Vătămănescu, Alexandru & Andrei, 2015), all the more so as the ability and art to manage and adapt to contemporary mutations should be viewed as a survival kit and not as a future scenario (Vătămănescu et al., 2017).

Within this framework, for many organizations – especially for the small and medium-sized enterprises (SMEs) - going beyond national borders and adopting a global outlook come forward as a premise of staying in the game, among those who see, understand and act accordingly. Leaders are dared to embrace and assume a global mindset - as Cohen (2010) advanced, respectively to analyze and lead their organizations through the lens of a global perspective, even when they are dealing with small or medium-sized businesses. The imperative to innovate and to cement sustainable organizational edifices is often connected to the ability of leaders to influence individuals, groups, organizations and systems that have a different type of knowledge and intellectual, social and psychological intelligence, to acknowledge the existence of borders

without borders in their strategic ventures. This is expected to imply – to a great extent – the advent of a cultural intelligence as operationalized by Ang et al. (2007) in the context of international business relationships. Griffith (2010) and Griffith and Hoppner (2013) state that SME leaders must possess a special cultural intelligence that enables them to actively adapt to the realities and challenges of the external environment – international and/or global – and to identify the optimal approach to strategic partnerships.

Despite the desirability of adopting a global mindset and associated propelling factors, real-life situations bring to the fore a compelling counterforce, namely the psychological proximity. This is descriptive of the leaders' preference for targeting certain countries / markets characterized by a lower psychological distance given that a progressive venture into closer realms would be, in many cases, a wise choice for conducting businesses (Nordman & Tolstoy, 2014; Sandberg, 2014). The perceived foreignness of international markets is catalyzed by differences in language, education, values, level of development, social and political climate, etc. Here, greater psychological, social and cultural distance triggers greater "liability of foreignness", as Johanson and Vahlne (2009) suggest. In other words, less psychological distance would entail leaders' perception of a higher control over their ventures and, implicitly, over business operations.

Corroborating the aforementioned research directions, the current study intends to address the dialectics of the global mindset versus psychological proximity in the case of SMEs leaders. The focus is on the development of cross-border relationships and strategic partnerships in search of sustainable competitive advantages founded on innovative endeavors. To this end, a questionnaire-based survey will be conducted to determine the correlations and influences between a global approach versus a step-by-step approach in relation to cross-border performance.

Keywords: *leadership, global mindset, psychological proximity, innovation, cross-border performance.*

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Ab.14

Transformational leadership, innovative work behavior and the mediating effect of affective wellbeing and psychological empowerment

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ABSTRACT

Innovation is generally considered as one of the drivers of organizational development, while transformational leadership has been constantly argued as a key-driver of innovation at all levels, from new product development, to customer care, operational efficiency or teams' performance enhancement. Numerous studies have highlighted the importance of innovation in today's organizations, discussing different related aspects, such as the alignment between the technology innovation effectiveness and the organizational transformation (Santa et al., 2009; Santa et al., 2011; Badr, 2016) or trying to identify specific associated predictors for innovative work behavior (De Jong & den Hartog, 2008; Podsakoff et al., 1996). Previous empirical findings have demonstrated a positive relationship between transformational leadership and different work outcomes such as innovation (Mumford et al., 2002; Amabile et al., 2004; Eisenbeiss et al., 2008; Nijstad et al., 2014), sustaining theories that consider innovation a key function of transformational leadership. Nevertheless, transformational leader behaviors have been proved to potentially generate both positive and negative effects on innovation (Li et al., 2016), while the research about the potentially mediating role of work related affective wellbeing or psychological empowerment is scant.

Our paper explores the relationship between transformational leadership and employee innovative work behavior, additionally examining the mediating effect of work related affective wellbeing and psychological empowerment. Data were collected from 127 postgraduate employed students through the following structured questionnaires: MLQ – Multifactor Leadership Questionnaire, IWB – Innovative Work Behavior, JAWS – Job-related Affective Well-being Scale and Psychological Empowerment Instrument. The findings revealed a positive and significant relationship between transformational leadership and innovative work behavior. Results also imply that transformational leadership through psychological empowerment foster innovative work behavior, showing that the relationship between transformational leadership and innovative work behavior is stronger among participants who experience positive emotions at work.

Keywords: transformational leadership, innovation, work behavior, affective wellbeing, work environment

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Ab.15

Digital borders and echo chambers: the divisiveness of social platforms in diffusing innovative ideas

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ABSTRACT

Our paper focuses on the diffusion of innovation and new ideas in the digital environment of today's globalized world. We argue that, whereas in principle the internet allows a rapid and efficient diffusion of all types of innovation within society, there are some factors that actually impede its free circulation. It is the design and functionality of social platforms that accidentally leads to the emergence of new digital borders between communities of ideas. Paradoxically, more interconnectivity of individuals means less interconnectivity in terms of beliefs, shared views and basic values. Starting from these observations, we will discuss the implications of online echo chambers for political, social and business leadership, and for the emergence of innovative, disruptive ideas within societies.

1. Networks and hierarchies: how innovation occurs within society

We owe one of the most comprehensive views on how innovation occurs within society to the historian Niall Ferguson (2018). In his recent work, he posits that we are living in a networked world, and that the recent shift in global power from hierarchies to networks is largely due to digitalization and the internet. To understand the importance of networks throughout

history, and especially in today's world, one must start from the definitions of the two concepts. If the natural world consists of optimized networks (West, 2018), the human society makes no exception from this rule. Social networks are structures that human being naturally form. These networks can consists of anything from emotional and family bonds to webs of knowledge, ideas, innovation, and social change. In general, social networks tend to a have a spontaneous, self-organizing character, with minimal structure and leadership, and favor peer-to-peer communication (Ferguson, 2018). By contrast, hierarchies are a special type of network consisting in a top node of highest centrality. Within societies, hierarchies (political, economic, corporate etc.) are the receptacle of formalized power, and tend to be systematically contested by networks. It is the clash between networks, or between networks and the hierarchy that prompts change and innovation within society: "Networks are important not just as transmission mechanism for new ideas, but as the sources of new ideas themselves." (Ferguson, 2018).

Two were the moments in history when networks managed to efficiently overthrow the hierarchies (Ferguson, 2018). The first started with the invention of the mobile printing press, allowing for the spread of revolutionary ideas, and ended with the rehabilitation of monarchies in the nineteenth century. The second began in the 1970s under the systemic pressure of economic globalization, and went global with the spread of the internet and the disintegration of the Soviet Union.

2. Echo chambers as digital borders

The internet, the network of networks, is considered to be a main factor of innovation, and change in the formal hierarchies within a globalized world. Scholarly work in the last decade emphasized its importance for collaborative innovation within the business environment (Sawhney et al, 2005; Chesbroughn et al. 2017), for establishing urban and regional innovation ecosystems (Schaffers et al., 2011), for a new and inventive knowledge management system and an open approach to foster knowledge flows (Santoro et al, 2016), or for political change (i.e. the role of social media in the Arab Spring uprisings, or in democratic elections).

However, recent occurrences within the developed world and within the digital ecosystem suggest we are returning to an era of virtual (and sometimes physical) borders that impede networks of innovation to efficiently communicate with each other, to fuse, to exchange ideas, or to find shared solutions to common problems. In this regard, I. Bremmer (2018) denounces the "failure of globalism". Among the factors that led to a new understanding of the world as a prevailing division into "us" and them" are, according to the author, the growing division of wealth, migratory fluxes that challenged the capacity of the host society to satisfy both the native population, and the migrants, geopolitical instability and security threats, the digital technology and the filter bubbles, and the perils of automation and artificial intelligence.

Societal polarizing changes are mirrored and amplified in the online environment. Globally and locally, hostile mainstream camps are formed on political and social issues. The digital platform technologies that initially allowed collaborative innovation in business, social and political areas, now allow for enclavisation and hostility. Through their structural intrinsic flaws, they act as barriers to the free circulation of ideas. This situation is particularly obvious within social platforms. Social media algorithms frequently distribute polarizing political content by selecting what information to show in news feeds based on user preferences and behavior (Narayanan et al, 2018), thus creating echo chambers and filter bubbles (Allcott & Gentzkow, 2017; Spohr, 2017). There is solid evidence that people actively seek, like and endorse the views that support their own opinion, while tending to ignore or actively block contradictory

information, even when it is factual (Lazer et al., 2017; Mullainathan and Shleifer 2005; Wardle & Derakhshan, 2017;). Our cognitive biases allow disinformation to flourish, and echo chambers to deepen and multiply (Lazer et al., 2017). Or as N. Ferguson (2017) puts it, "Facebook encourages you to like or not like what you see in your news feed. Twitter allows you to retweet or like other people's tweets or block those users who offend your sensibilities. Pretty soon you are in a filter bubble inhabited exclusively by people who share your view of the world. The result is a paradise not just for fake news but also for extreme views. […] In this binary world, there is not much room for ambivalence".

Between sides, impenetrable symbolic borders emerge. It is a situation some foreseen many years ago. For instance, Van Alstyne and Brynjolfsson emphasized the dangers of "cyberbalkanization" (as in isolation, fragmentation, and division) brought by the new information technologies. In 2001, Cass Sunstein warned on the risk of selective exposure to political information and to customized news digest that impedes users from having shared references and interests. More recently, Thi Nguyen (2018) distinguishes between two variants of digital polarization: echo chambers and epistemic bubbles, which work in entirely different ways, and they require very different modes of intervention. An 'epistemic bubble' is an informational network from which relevant voices have been excluded by omission, somitemis purposefully. Escaping an epistemic bubble is possible simply by exposing users to alternative sources of information. An 'echo chamber' is a social structure from which other relevant voices have been actively discredited. It isolates its members by actively alienating them from any outside sources (Jamieson, Capella, 2008).

As research suggests, social media platforms, and the digital ecosystem in general are particularly efficient at creating and multiplying echo chambers. It is not the diversity of voices and ideas that matters, but our reaction to them. As long as within polarized online communities (or sides, or "tribes"), outside ideas are systematically rejected and discredited, it is expected that systemic innovation, as in solutions that emerge from collective intelligence, and are then diffused locally and globally will become increasingly difficult to attain.

3. Methodology

Given this context, the goal of our research is to investigate the digital behavior of internet users within eco chambers. Additionally, we explore the consequences of exposure to echo chambers for reinforcing the "us" versus "them" polarization and the uncritical rejection of alternative, innovative ideas.

By conducting a survey among the young, educated student population in Romania, we seek answers on the following research questions:

RQ1. What is the level of awareness of the respondents on the phenomenon of echo chambers?

RQ2. What are the patterns of digital behavior that increase the chances of exposure to, and captivity within online echo chambers?

Next, we turn to a qualitative approach to delve deeper into the issue. By means of semi-structured interviews, we seek answers to the following questions:

RQ3. What are the consequences of exposure to echo chambers for reinforcing the "us" versus "them" mindset placed at the core of the phenomenon?

RQ4. What are the consequences of exposure to echo chambers for the diffusion of innovative ideas?

4. Implications and relevance of research

A better understanding of the digital behavior of the audience within echo chambers and filter bubbles is necessary to clarify the extent to which the digital media ecosystem, and especially social platforms, act as facilitators of barriers in open societal innovation and change. Despite a polyphony of voices, digital polarization deepens the isolation of individuals and groups, making sensible social change harder to implement. This new, divided world questions the success of globalization in blurring borders and the boundaries of any kind (from countries and societies to organizations and markets).

Keywords: *echo chambers, filter bubbles, networks, systemic innovation*

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Ab.16

Knowledge dynamics: A thermodynamics perspective

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ABSTRACT

The purpose of this paper is to present a change of the paradigm for *knowledge dynamics* from the well-known Newtonian logic based on spatial and temporal variation of a certain variable to the more complex understanding of structural changes and transformations within some entities by using a thermodynamics paradigm. Thus, we aim at answering the following research question:

How can we overcome the limitations of tangibility and linearity induced to the concept of knowledge dynamics by the Newtonian metaphors?

The method used to demonstrate the need and possibility of such a paradigm change is *metaphorical thinking* (Andriessen, 2006, 2008; Lakoff and Johnson, 1980, 1999). Thus, we focus on *conceptual metaphors* which help us to map one experience in terms of another one, making it possible to understand new situations or abstract concepts in terms of what we already know. According to Pinker (2008, p. 241), "Conceptual metaphors point to an obvious way in which people could learn to reason about new, abstract concepts. They would notice, or have pointed out to them, a parallel between a physical realm they already understand and a conceptual realm they don't yet understand".

From this perspective *knowledge* is an abstract concept without any physical object as a reference. Knowledge does not have any clearly defined structure and semantic field. "Whatever structure it has it gets through metaphor. Different people from different cultures use different metaphors to conceptualize knowledge" (Andriessen and Boom, 2007, p. 3). The first metaphors used to conceptualize knowledge contain *objects* in the source domain. This approach is in concordance with the resource view of organizations (Barney and Clark, 2007), knowledge being

considered a strategic resource (Bolisani and Bratianu, 2018). As a result, knowledge can be considered as a well-defined entity which can be created, stored and transferred as any physical object. It can be accumulated and distributed, which implies linear operations of summation and division like in the Newtonian logic. That leads to the idea that organizational knowledge is a *stock* which can be related immediately to the intellectual capital potential (Davenport and Prusak, 2000; Stewart, 1999). However, these attributes create confusion since knowledge is not a linear entity. To enlarge the semantic meaning of knowledge, researchers developed new metaphors which introduce in the source domain the concept of *fluid flow* or *stocks-and-flows* (Bolisani and Oltramari, 2012; Nissen, 2006). According to Bolisani and Oltramari (2012, p. 280), "We can denote knowledge stock as the amount or level of knowledge possessed at a particular time in an organization, while knowledge flows identify knowledge that is transferred from one economic player to another". These types of metaphors have been extensively used due to their simplicity and intuitiveness. They introduced also the idea of *knowledge dynamics* but from a Newtonian perspective, as a variation of knowledge in space and time like the motion of objects through a physical environment. The Newtonian perspective of knowledge metaphors proved to be very useful in developing knowledge management, but it induces the limitations of tangibility and linearity on understanding knowledge and intellectual capital correctly (Bratianu, 2009, 2018). These limitations generate many problems especially when researchers develop different metrics for evaluating knowledge and intellectual capital. As Dumay (2009) remarks these metrics lead to the phenomenon of "accountingisation", which means that intangibles are treated like tangibles in the balance sheets.

In order to overcome the limitations of tangibility and linearity induced by knowledge as objects and knowledge like stocks-and-flows metaphors Bratianu (2011) suggested a new metaphor based on the concept of energy. In the new metaphor the energy semantic field is placed in the source domain and the knowledge semantic field in the target domain. Three main attributes are transferred from the source domain to the target domain (Table 1).

Table 1 – The mapping of the source domain onto the target domain

The source domain	**The target domain**
Energy is a field	Knowledge is a field
Energy has different forms	Knowledge has different forms
One form of energy can be transformed into another form of energy	One form of knowledge can be transformed into another form of knowledge
Energy dynamics means energy transformation	Knowledge dynamics means knowledge transformation

Considering *knowledge as a field* eliminates the limitations of tangibility and linearity. Knowing that energy manifests in different forms, like mechanical energy, thermal energy, electrical energy, we can assume that knowledge can manifest also in different forms. Searching for the most basic characteristics, we may define the following three fundamental forms of knowledge: *rational knowledge, emotional knowledge and spiritual knowledge*. Rational knowledge is objective and it is about the physical world we are living in. It can be expressed by using a natural or symbolic language, which makes it explicit (Davenport and Prusak, 2000; Nonaka and

Takeuchi, 1995). Rational knowledge is a result of system 2 of thinking, which is logical and slow (Kahneman, 2011). As emphasized by Russell (1972, p. 153), "It follows that we cannot know things through the senses alone, since through senses alone we cannot know that things exist. Therefore knowledge consists in reflection, not in impressions, and perception is not knowledge". For Russell all the knowledge is in fact rational knowledge.

Polany (1983) analyzes the paradigm of rational knowledge and came out with the idea of *tacit dimension of knowing*, i.e. knowing from direct experience of one's body. Tacit knowledge contains emotions, intuitions, values and hunches (Nonaka and Takeuchi, 1995). *Emotional knowledge* is that wordless knowledge resulting from processing the sensory systems information which vital in emergent situations (Damasio, 2012). It triggers the survival action through the System 1 of thinking (Kahneman, 2011). In situations of imminent danger, there is no time for reflection and rational system judgment, but to choose instinctively between *fight* or *flight*. Emotional knowledge is important in decision-making, especially when time becomes a constraint. As Hill (2008, p. 2) remarks, "Breakthrough in brain science have revealed that people are primarily emotional decision makers".

Spiritual knowledge constitutes the third fundamental field of knowledge. It reflects our understanding about our existence. It integrates at individual level possible answers to deeper questions concerning our existence: Who am I? Why I am here? What is my connection with the universe? As Maxwell (2007, p. 274) explains, "We have to learn to see aspects of the world around us: stone, people, trees, sky. Equally, we have to learn to see meaning and value in the world around us, in our environment, in events, in human actions and lives". Spiritual knowledge yields the guidelines for any decision-making and values sharing in any organization (Porter and Kramer, 2011; Zohar and Marshall, 2000).

Following the *thermodynamics principle* of transformation of one form of energy into another form (e.g. mechanical energy into thermal energy), we may consider the transformation of one form of knowledge into another form of knowledge. Thus, we can demonstrate that in decision-making emotional knowledge transforms into rational knowledge and rational knowledge into spiritual knowledge and vice versa. These transformation processes are supported only by the *energy metaphor* and not by the others. It makes the difference between knowledge dynamics seen as knowledge flow and *knowledge dynamics* seen *as transformation*. The thermodynamics perspective opens new directions for research and creates a better understanding of the managerial decision-making and the motivational process. Our contribution comes from considering knowledge as a field and in defining these three fundamental fields of knowledge (i.e. rational, emotional, and spiritual), which are in a continuous interaction and transformation. Managing knowledge dynamics represents the challenge of the knowledge management and its integration into the strategic thinking of the transformational leaders.

Keywords: *metaphorical thinking, rational knowledge, emotional knowledge, spiritual knowledge, knowledge dynamics.*

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Ab.17

Knowledge Management approaches of small and medium-sized firms: a cluster analysis of KIBS companies

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ABSTRACT

The challenges of today's economy imply a redefinition of companies and their relationship with clients, suppliers and business partners. Facing the dynamics of innovation and markets requires that organizations exchange knowledge effectively, both internally and with external entities. On the other hand, exploiting and protecting the competencies developed internally

becomes vital. All this means that companies need appropriate approaches to Knowledge Management (KM).

Particularly, there is a need to categorize the different possible approaches to KM that companies can adopt. After more than two decades of research in KM, there is no consensus among scholars or practitioners on a universal or "best" approach to KM for all organisations, especially in the case of smaller companies. Indeed, different categories of possible KM strategies have been identified, based on the distinctive context of application (e.g. Choi and Lee, 2003; Hansen et al., 1999; Leidner et al., 2006; von Krogh et al., 2001). Furthermore, while KM has often been considered to be a deliberate activity based on formal plans, predefined processes and explicit resource allocation (Razmerita et al., 2016), other studies (Van den Hoff and Huysman, 2009; Zięba et al., 2016) show that, not rarely, informality and occasional problem-driven solutions may prevail. Therefore, there is still the need to achieve better understanding on this point and, particularly, to make an attempt of classification of the different possible KM approaches and their traits.

This study especially addresses this issue with regard to small and medium-sized enterprises (SMEs): while there are many studies that investigate the use of KM in large companies, research regarding SMEs is still scarce (Centobelli et al., 2017) and does not provide ultimate results (Durst and Edvardsson, 2012). Therefore, to contribute to fill this gap, the paper aims to single out and discuss the variegated features that characterize the implementation of KM by SMEs having different characteristics.

The paper discusses the findings of a cluster analysis performed to detect and examine the possible distinct traits of companies that have different approaches to KM planning and implementation. The unit of analysis is represented by small and medium sized KIBS (Knowledge Intensive Business Services) companies. KIBS are an increasingly important economic sector, and their business is mainly based on the management of knowledge (Palacios-Marques et al., 2011). For this reason, they appear to be a particularly important object of analysis.

The data used in the statistical analysis were collected by means of an extensive survey of 223 companies in 4 different European countries (Italy, Poland, Romania, Spain) and belonging to different sectors (ICT services, technical services, professional services, marketing and communications services). A structured questionnaire was submitted to key informants of these companies (i.e. owners, executives, or managers). Data were collected between 11.2016 and 10.2017. The distinctive traits of companies and their KM approach were investigated by means of questions regarding: origin, restraints, promoters, scope, universality, formality, adaptability of KM initiatives carried out by the single companies.

After a preliminary analysis of the collected information, which helped to clarify the main features of the sample and to better focus the investigation, a cluster analysis was performed, with the purpose of classifying companies into different categories of KM approach. Three clusters were identified, as follows:

- The first cluster is characterised by a relative low attention to knowledge and KM, probably due to the fact that KM concepts are not sufficiently known. Companies belonging to this cluster have adopted a good number of KM-related practices, possibly because they consider them useful in general, but without making a direct reference to KM.

- The second cluster is characterised by a sort of "conscious" management of knowledge that is characterised by the introduction of a relevant number of practices, including those that are often considered "KM-specific" (as e.g. rewarding employees who share knowledge, using structured electronic repositories, or using Communities of Practice). These companies declare to have a quite good acquaintance with KM concepts and methods.
- The third cluster is characterised by a marginal propensity towards KM, as testified by the relatively low number of KM practices that they have adopted and the shallow attention of executives or owners towards KM in general.

The paper illustrates and discusses these findings in detail, and also suggests the implications for research (particularly as regards the analysis of KM strategies of the different kinds of companies and especially SMEs) and for management (namely as concerns the level of awareness of KM by executives and entrepreneurs, and the analysis of the possible strategic options that companies can have).

Keywords: *Knowledge-Intensive Business Services, Knowledge Management, Strategic adoption, Cluster analysis*

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Ab.18

Challenges of knowledge management systems in the digital era: the Millennials' perspective

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ABSTRACT

Knowledge management systems, as almost every aspect of the social and economic life, are challenged and transformed by the current digital revolution, as new technological solutions become popular and accessible: Internet of Things, augmented reality, robotics, artificial intelligence, Big Data, Social Media, mobile communication etc. The recent developments in the technology of all types of smart solutions impact organizations at all levels, transform business and management models (Pînzaru, 2018; Van Alstyne et al., 2016), and indicate an important gap between the classical way of understanding knowledge management systems and the necessity of redesigning them. The way that knowledge is created, shared and learned, is changing under the influence of the new digital wave (Kaivo-oja et al., 2015). An additional pressure in this direction is determined by the expectancies of the digital natives or of the generation Y (Millennials) of new employees (Pînzaru et al., 2017), born between 1980 and 2000, and who were the first people literate in the digital environment and will account for 50% of the global workforce by 2025 (PwC, 2011).

Millennials are both the new employees and soon the new managers and the way that they perceive the professional world has already a strong impact on organizations worldwide. They are considered different from their predecessors, as they tend to often change jobs, in a difficult

quest of a perfect balance between private life and professional development. Even if psychologically the digital natives are not different from other generations (Pînzaru et al., 2016), they tend to adapt much faster to new technologies and value more their own beliefs instead of the organizational goals (Deloitte, 2016). Being also accustomed to instant gratifications, both because of education and digital literacy, the Millennials are already perceived as a different typology of employees, managers and customers. Therefore, their perceptions on organizations at general level and on knowledge management systems at a specific level could reveal a different understanding of the way that knowledge should be created, shared and learned in the new digitalized world.

Our paper investigates the perceptions of the digital natives on current knowledge management systems and their ideal version of these ones in the digital era, trying to extend discussions beyond the usage of technology for information gathering, analytics and transfer, to its role in increasing productivity and on the possible consequences on existing jobs. Specific questions on the evolution of current knowledge management systems in the context of newer affordable and more performant digital technologies are also raised.

The three dimensions of the knowledge management systems that are questioned in our survey are the ones of the understanding: information, technology and/or culture based (Alavi & Leidner, 1999), emphasizing the perceptions of the benefits, the weaknesses, the challenges and the development of knowledge management systems in the current digital era, as perceived by the Millennials. Specific topics like the usage of Social Media, Big Data, Internet of Things, artificial intelligence etc. as parts of the knowledge management systems are also discussed, both in terms of knowledge creation and transfer. Finally, we ask for insights on the perceptions of the needed competences to keep knowledge management systems efficient and valuable to organizations.

Keywords: *knowledge management systems, digital natives, generation Y, Millennials, digitization, digital transformation.*

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Ab.19

Knowledge management strategies in NGOs – organizational sustainability, cross-border cooperation and social well-being

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ABSTRACT

Nonprofit organizations are an increasingly more important part of the contemporary society. This sector increased significantly across Europe in the past decades, both quantitatively and qualitatively, considering both its economic and social relevance. The literature on knowledge management stresses the importance of knowledge as an asset for all types of organizations leading to competitive advantage (Adams & Lamont, 2003; Davenport & Prusak, 1998; Fidel, Schlesinger & Cervera, 2015; Webb, 2017). Most of the studies on knowledge management investigate various aspects in business organizations. Relatively many studies are addressing the realities of governmental organizations (Biswas, Khan & Biswas, 2017; Buheji et al., 2015; Laihonen & Mäntylä, 2018; Massaro, Dumay & Garlatti, 2015). Nevertheless, more recently, attention was also given to nonprofit organizations (Hurley, & Green, 2005; Rathi, Given, & Forcier, 2016; Tatham, & Spens, 2011; Zbuchea & Leon, 2015).

Effective knowledge management systems could lead to increased adaptation to the needs of stakeholders, improve efficiency in operations, develop the quality of services provided (see, for instance, Liebowitz & Chen, 2003; Riege & Lindsay, 2006). In addition, knowledge management could lead to effective co-creation of well-being involving not only nongovernmental

organizations, but also its beneficiaries and stakeholders, as well as public partners (Barrutia & Echebarria, 2012; Black & Gallan, 2015; Bovaird & Loeffler, 2012; Voorberg, Bekkers & Tummers, 2015). Knowledge transfer, both inside the organization and outside, is key to successful management of nonprofit organizations. Transfers of knowledge between departments could lead to increased effectiveness across the organization. External knowledge could be integrated in internal processes for increased performance and better relationships. Cross-border exchanges are also vital for more networked and effective nonprofit organizations. Knowledge management in nongovernmental organizations is more personal than in business. Organizational infrastructure is important, but human-related factors and organizational climate are influencing in a large degree knowledge sharing and development (Zbuchea & Leon, 2015).

In this framework, the present paper investigates the extent to which nongovernmental organizations in several countries have adopted knowledge management systems and how do the manage knowledge transfers inside and outside organizations. Three dimensions are considered: knowledge management system, knowledge sharing and organizational learning. A survey is applied in Romania, Greece and other Eastern European countries in order to map the knowledge management processes, as well as cross-border knowledge sharing in nongovernmental organizations. The paper contributes to the theoretical body by highlighting how knowledge management and sharing within and outside, include cross-border transfers, contribute to the sustainable development of nongovernmental organizations and to the well-being of the society.

Keywords: *knowledge management, nonprofit organizations, cross-border knowledge transfer.*

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Ab.20

On the spread of misinformation through online media: a knowledge management approach

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ABSTRACT

An extensive debate was brought in the last two years by the increasing evidence on the high extent to which fake news and conspiracy theories are shared publicly in the online media,creating confusion, misleading those who are prone to believe fake stories to be true, and growing public distrust of institutions and their policies.

The results reported by recent surveys and studies indicated misinformation as a global-scale problem (Shearer et al, 2016; Allcott., Gentzkow, & Yu, 2018). The increased number of people believing fake stories and conspiracy theories - such as those related to climate change, 'chemtrails' (the existence of a secret large-scale atmospheric spraying program), artificial diseases, alternative therapy suppression, vaccine conspiracies – have generated troubles in many parts of the world. For example anti-vaccination trend induced by conspiracy theories related to vaccine safety represent a serious threat to the public health because of the growing rates of infection and death it has generated in the recent years in many countries (including the US, UK, Germany, Italy, Romania), while some fake news seems to have an important role in the ongoing political crises and the general decrease of social trust (Allcott., Gentzkow, & Yu, 2018; Spohr, 2017).

Few attempts to reduce the impact of conspiracy theories and the online spreading of fake-news were already made by big technology companies (i.e. Google; Facebook; Twitter) and some nonprofit organizations (i.e. educational support provider for credibility assessment News Literacy Project; fact-checking websites FactCheck and PolitiFact). Still, according to the study of Allcott, Gentzkow, & Yu (2018) the level of user interaction with misleading content remains

high in social media (i.e. Facebook and Twitter) in spite of Facebook's collaboration with fact-checking websites and all technical and policy changes adopted by the online platforms (i.e. the priority in receiving content posted by friends, family and trusted publications; corrective information displayed as 'related articles' to fake-news; ads blocking and hoaxer's account removing).

Therefore, it becomes obvious that a systemic approach, and the concerted efforts of the public entities, the private companies from online industry, the academia, and the civil society and media (the four actors of the Quadruple Helix Model advanced by Carayannis and Campbell in 2009) are needed to properly address the growing influence of conspiracism and misinformation problem in the online media, while preserving the free speech and democratic values.

In this frame of the four helices, our study focuses on civil society. The study follows the literature stating that creating and maintaining a context of trust depends on both institutions and citizens, and proposes a framework of analysis meant to explain how social trust and conspiracy mentality are influencing citizen engagement in public life through different forms of action specific to online and offline areas.

The study draws on social capital and knowledge management literature (Putnam, 2001; Uslaner, 2002, 2004; Uscinski et al., 2016; MacGregor et al., 2010; Carayannis and Campbell, 2009) to derive research assumptions. It examines empirical data collected online in the East European space, presents results, and discuss knowledge management approaches and potential strategies to be used for safeguarding the proliferation of misleading content in the online media.

Keywords: *social trust, citizen engagement, misinformation, conspiracism, knowledge management*

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Ab.21

Correlating intellectual capital and SMEs internationalization. A systematic literature review

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ABSTRACT

The extant literature on the available resources of small and medium-sized enterprises (SMEs) has consistently advanced the idea that this type of organizations is often deprived of the necessary assets for international undertakings. Various studies (Hutchinson and Quintas, 2008; Gabrielsson et al., 2008; Vătămănescu et al., 2016, 2017) have posited that the lack of proper resources emerged as a serious constraint for SMEs to successfully internationalize, thus afflicting their international performance. Still, Frazier et al. (2009) underlined that the international development of organizational relations implies major costs, but the outcomes of establishing such connections among managers and businesses can yield substantial benefits at multiple levels.

As smaller companies often lack resources, managers are determined to lay more emphasis on the development of social and business networks meant to ensure an environmental-friendly framework for international partnerships. They strive to boost the usage of intangible assets and knowledge sources as a basis for future collaborations. In this front, attaching importance to the value of intellectual capital (IC) in the internationalization of their organizations comes forward as a suitable knowledge strategy and as a pertinent compensation for the shortage of material and financial resources.

Three pivotal dimensions of the IC have been summarized by the specialized literature, namely the human capital (i.e., education, experience, competence, knowledge, skills, innovativeness, attitude, commitment, wisdom, and creativity), structural capital (i.e., organizational capabilities, culture, routines, strategies, information systems and trademarks) and relational capital (i.e., all the relationships between the internal intellectual resources and the external stakeholders) (Dean and Kretschmer, 2007; Vătămănescu et al., 2017). The human capital is the first dimension of the IC given that highly-skilled managers can contribute to improve business processes, can make SMEs more competitive and valuable, hence contributing to their sustainable advancement. Nevertheless, all these facets of IC are interconnected (Still et al., 2013) as human capital does not exist isolated, but in interactive relationships, while the relational capital can manifest itself because people, possessing knowledge, skills, experience and attitude interact with others (Vătămănescu et al., 2018).

Building on the above described logic, the present endeavor aims to theoretically address the state-of-the-art in the specialized literature regarding the three IC dimensions and SMEs internationalization. Even though there have been various initiatives in this direction, most studies feature univocal and monolithic approaches, falling short to discuss the corresponding correlations in a comprehensive manner. To provide a solution to this shortcoming, the study is intended to bring to the fore a unitary outlook on the conceptual developments which correlate the leverage of human, structural and relational capital and SMEs internationalization. To this end, a systematic literature review will be conducted, highlighting the existing research achievements in the field and future avenues to investigate.

Keywords: intellectual capital (IC), knowledge, internationalization, small and medium-sized enterprises (SMEs).

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SUSTAINABLE DEVELOPMENT

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Ab.22

Biocybernetic Approach for Sustainable Developments

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ABSTRACT
In recent decades politics and economies have focused increasingly on quantitative growth while exploiting and wasting natural resources, mainly due to linear management- and production processes of past centuries. Combined with the exponential growth of population and technologies, these linear ways of planning and management have created an overall critical situation throughout our social, ecological and economical systems, threatening the basic resources providing the existence of future generations.
Although new and systemic knowledge has been gained regarding the interdependencies in our interconnected global world and sustainability contexts, the application of systemic and holistic knowledge is seriously lagging in the reality of politics, governance, economies, and education. It seems that something fundamentally constrains the necessary change in our modes of governance, e.g., situation assessment, strategy formulation and action planning.
Recent generations of scientists, politicians, organizations and individuals have already been investigating the nature of complex systems, modelling complex problems and suggesting solutions. But these efforts have not proven the necessary and sufficient success in light of the variety, dynamics and ambiguities in the problem space. It is now clear that deeper approaches are needed for creating really viable and survivable systems.

This abstract introduces a helpful approach to a mode of system design that may prove equal to the challenge. The German biocybernetician, leading ecologist and bestseller author, Prof. Frederic Vester, explains that to achieve real change and transformation of our behaviour and governance towards the design of resilient systems we have to obey the rules and laws of nature. Nature, which, by the way, is our only model for orientation, being ourselves part of nature. To safeguard the basis of human existence, it is necessary to understand the highly complex systems, their high dynamics and rate of change. Vester called this ability to understand these interdependencies "interconnected thinking" and suggested a "bio cybernetical approach", understanding and using the laws of nature, to cope with these complex problems.
Building on the work of many cyberneticians and system researchers before him, Vester's claims are based on his former interdisciplinary research as a biochemist, cancer and brain researcher bout efficiently working systems like cells, brains, ecosystems and how these functioning systems are able to work with such great efficiency. These systems have a few similar typical patterns in common, which he described as "Eight Biocybernetic Rules" and which can be used as an orientation model for successful and resilient systems.

Only nature with its balance through feedback processes and self-regulation, with its independency of quantitative growth, with function orientation, with symbiosis and multiple use of products, with self-organization and homeostasis, with continuous adaptation, with recycling and biological design gives us valid examples of resilient and sustainable systems.
These aspects are the basis for his eight biocybernetic rules, "a set of rules which can be described as the basic laws for viable systems" (Vester 1976). In analogy with the functions of single cell as a prototype, the smallest living system, these basic mechanisms can be used as a model for viability of larger human-made systems.

These eight rules and their requirements for sustainable systems are described in short:
1. Self-regulation as main mechanism is creating a flowing equilibrium, capable of evolution.
2. The system shall be independent of one-sided quantitative growth
3. Orientation on the function allows independency of products
4. Use existing forces and energies instead of fighting them
5. The principle of multi-use helps to reduce material and energy
6. Recycling and circular processes are the basis of all living systems
7. The principle of symbiosis leads to savings of resources and to a stable coexistence to mutual benefit
8. Biological design: Products, functions and organisation should be compatible with the biology of Man and Nature – a broad range from creative bionics to organizational cybernetics.

For the broad implementation of these basic rules we must shift to a new kind of systems design that employs "interconnected thinking", overcoming artificial borders. New methods, media and digital tools have been developed to facilitate this new way of thinking. Frederic Vester had developed a method called "Sensitivity Model®Prof.Vester" – analysing the sensitivity or robustness of a system as a practical planning and management tool (later further developed by Fredmund Malik). The user is guided through the process of capturing a system, understanding its main variables, impacts and relations. If-then scenarios and transparent simulation reveal the dynamics of the systems including its adaptability to changes and the development of sustainable measures. With the analysis of feedback cycles and the continuous biocybernetic evaluation of the system on the basis of the eight rules, it offers a new and unique access to the cybernetics of a complex system and its functioning ways to design sustainability and viability.
But apart from the application in a broader system analysis, Vester's eight biocybernetic rules can also be applied in a fast and preliminary way, using a checklist and evaluating how the selected project or concept fulfils the biocybernetic rules. Just asking the right questions will help to assess its sustainability: "Will the system achieve balance (and sustainability) through self-regulation or is it enhancing itself, and thus demanding too many resources?" "Is the system only dependent of permanent quantitative growth?" "Is the concept focussing on function orientation (which allows a complete different view) instead of the usual "product orientation"?
The "Eight Basic Principles of Bio cybernetics", in particular, provide an "orientation model" and set of instruments for understanding and dealing with complex systems, focusing on preserving and strengthening nature, while at the same time enabling the transfer of acquired insights to other problems. They can serve as clear guardrails for orientation in the design of viable and sustainable systems, for the development of environmental assessments and policies.
It may finally be mentioned, that the principle of biocybernetics requires not only to see ourselves as cybernetes or gubernators, but to understand ourselves as a part of the whole system, and as a

part of nature. Also, in the field of sustainability until now, the different sectors are often considered as separated, and wrong borders are installed. Single, seemingly sustainable solutions, planned without knowledge of the interconnections and interdependencies, unfortunately lead to new problems. This biocybernetic evaluation may also bring clarity if an intended sustainability concept is really “sustainable”and would lead to a different interaction with nature as well as with man-made systems.

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Ab.23

Corporate Social Innovation in the Supply Chain: the effects of local and business pressures.

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ABSTRACT

In a Complex Adaptive System (CAS) firm's view, the concept of corporate social responsibility (CSR) has been at the center of a broad and complex debate (Holland, 1992; Mohr, et al. 2001). The idea that the governance and management should take into account to create, maintain and evaluate not only the effects of their actions in the economic field but they should consider even the mutual social influences is a consolidated matter (Bowen, Johnson 1953; Davis, 1960; Winter, 1964; Quinn, et al. 1987). It follows that companies, to reach their viability (à la Winter, 1964:249) creating and maintaining interactive relationships with economic and social stakeholders useful to adapt its behaviors, have some additional moral or social responsibility asking them to go beyond both the simple compliance with laws and regulations to further some social good, and the economic direct interests of the firm (Lockett, et al. 2006). On a similar page Carroll (1991) developed the famous pyramid of Corporate Social Responsibility to highlight how that the corporation has not only economic and legal obligations, but ethical and discretionary (philanthropic) responsibilities as well. A set of responsibilities is considered to be "Ethical" when it asks the company to answer to a general sense of fairness and equity in dealing with the stakeholders and to respect and protect their moral rights. A responsibility is a philanthropic one when it requires the company to behave as a good citizen actively engaging in acts or programs to promote human welfare or goodwill.

Sometimes, the CSR-related activities does not have a specific actors promoting them as it happens for some activities to renovate the that can be classified as a way to address the moral and social responsibilities the company has with the future generations (Naess, 1990; Reynolds, Yuthas, 2008).

In spite of the broad concept, several authors hold some limits to CSR. On one side Sciarelli (2007) has highlighted how managers should limit their CSR-related activities to those that not endanger the very survival of the company as its first kind of responsibility is the economic one; on the other hand, Sacconi (2004) has identified an opposite limit not including in the CSR practices all those that could go under the broad umbrella of the corporate giving. On a different road Carroll (1979), in his 3D model of Corporate Social Performance, identified several "issues" the socially responsible practices can focus on; in a similar way Perrini, et al. (2010) have linked the outcomes of CSR efforts to the performance of the firm identifying several relevant areas of interest.

But CSR-related activities are not only a burden on the shoulders of the modern company limiting the managerial freedom as there are different motivation behind this increased diffusion of these practices both in financial ones, as an easier access to financial resources provided by Socially Responsible Investors (Sparkes, Cowton, 2004; Scholtens, Sievänen 2013), and the opportunity to get several potential advantages in the market (Czinkota, et al. 2014). A first example of these advantages is the ability to create more stable, and trustable, relationship with the social actors in the local area reducing the risks of some kind of retaliations while, at the same time, helping the company in administering these relationships at a lower cost (McGuire, et al. 1988; Jo, Na, 2011).

At the same time several studies have shown that, even if only a small segment of consumers uses CSR as a purchase criterion (Mohr et al., 2001), most consumers prefer to buy products from companies with a good CSR profile (Knox, Maklan, 2004; Castaldo et al., 2009; Grimmer, Bingham, 2013) and this may be deeply influenced by the company ethical and philanthropic practices (Park, et al. 2014) with a stronger effect when the CSR activity reflects the consumer's CSR beliefs (Mohr, Webb, 2005, Sen, Bhattacharya, 2001). Moreover, Companies can get a better reputation out of the CSR-related activities as the combination of all the interactions between the various perceptions and evaluations developed by each single stakeholder (Czinkota, et al. 2014) can be used to differentiate them from their competitors (Fombrun, Rindova, 1996; Roberts, Dowling, 2002).

When the CSR activities are aligned with normative and cultural expectations of a given social context, showing a firm isomorphic behavior, they should help the company to get a social legitimacy (Hannan and Freeman, 1977; Czinkota, et al. 2014) and it is a critical issue form corporations (Kostova, Zaheer, 1999) configuring CSR has a fundamental way to redefine the role of business in society (Deegan, 2002).

As a way to link the enterprise to the system the company is embedded into and as a way to increase its value in these systems, CSR related strategies and practices are central for Small and Medium Enterprises (SMEs) as they are tightly embedded in, at the very least, two different systems. On one side SMEs are part of a local area, while on the other their are part of some specific value chaing.

As active actors in their local area, SMEs are part of their social territorial system becoming one of the main constituents of SME's Social Capital (Adler, Kwon, 2002; Spence et al., 2003**;** Perrini, 2006) and it has been often referred to as one of the main drivers in SMEs' ability to innovate (Nunes, Lopes, 2015). This relationship has been found to be so strong that SMEs' managers use more the values of the community than their personal ones (Brown, King, 1982). According to this view, in the present work, the authors consider an "ecological approach" taking

in account the relations between organization and its local context, in which the firm, by means an implicit or explicit CSR, creates with the community of reference (Hannan, Freeman, 1977; Matten, Moon, 2008).

But local community is not the only strong factor affecting how a SME must behave in order to become a more legitimized actor; the opportunity to access global markets is often linked to the ability of the SME to enter a way bigger value chain.

This ability will be influenced by several factors. Some of them are related to technical and managerial capabilities but, at the same time, these companies will be asked evaluated even on their capability to carry on specific CSR programs considered as relevant for the supply chain as a whole (Czinkota, et al. 2014) or, at the very least, for its more important members (Jamison, Murdoch, 2004; Ciliberti, et al., 2008). It follows that in many cases SMEs cannot freely choose the CSR-related practices to carry on (Lepoutre, Heene, 2006)

In this paper the authors want to understand how these two different systems influence each other and if the CSR-related decisions, and practices, of Italian SMEs can be better explained looking at the local area system or at the supply chain one. In order to investigate this issue, we have carried on a survey of 3018 Italian SMEs investigating their role in the supply chain and how they carry on CSR-related activities. Our analysis shows that in many cases the pressure from the supply-chain is more effective in influencing the CSR-related strategies of SMEs but, at the same time, the difference in values reduces the motivation of the managers to focus on CSR.

Keywords: *Complex Adaptive System, Corporate Social Responsibility, Small and Medium Enterprises, Local Community and CAS, Supply-chain.*

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Ab.24

Coming to the term of sustainability in complex European smart cities

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ABSTRACT

Complexity theory help us to understand the urban transformation predicates on cutting-edge technology and on their basis prepared strategies for providing smart sustainable city (Batty et al., 2012; Grandin, Haarstad, Kjærås and Bouzarovski, 2018; Grimaldi and Fernandez, 2017; Roblek, Meško, Dimovski and Peterlin, 2018).

The sustainability has in the case of increasingly involving urban actors in smart city initiatives and stakeholder's higher significance in the holistic approach to setup networked knowledge – innovation activities in the smart city R&D and entrepreneurship environment (Bibri, 2018; Kumar, 2017; Raten, 2017). Such holistic models include the promotion of sustainable development and applying the term sustainable beyond its environmental dimensions (Rauter, Jonker and Baumgartner, 2017; Starik and Kashiro, 2013). The information and communication technologies (ICT) which are based on the IoT and IoS represent a new wave of computing for urban sustainability as a structure of science and technology (S&T) within the concept of a smart sustainable city (Bibri and Krogstie, 2016).

The valid urban sustainable structural reforms include economic and environmental perspective and strategy of long-term planning to ensure continuity in policy through urbanisation, socio-political and cultural aspects of development (Bibri and Bardici, 2015; Dent, 2017; Gibson et al., 2013).

The research is focused on an overview of launching successful and unsuccessful conceptualization of the networked urbanism, innovations concepts (education, economy, research, governance, technology and innovation), resources (energy, mobility, infrastructure and buildings) and quality of living (social inclusion, participation, healthcare and environment). (Anthopoulos, Janssen and Weerakkody, 2016; Bibri and Krogstie, 2016; Letaifa, 2015; Morosov and Bria, 2018). According to the literature review, we had developed the research question

(RQ1) is: what are the premises that defines the specifics and differences between EU smart and sustainable cities?

Keywords: *smart cities, information and communication technologies, holistic model, urban sustaianibility, Europe*

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Ab.25

Attracting skilled and affordable talent for sustainable well-being in the global era: analysis of cultural heritage perception

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ABSTRACT

Research proposal

Cultural heritage is a pressing issue in the Western societies. Perez-Alvaro (2016) states that climate change has the potential to increase the sea level till 2100 to ruin 136 sites considered by UNESCO as historical and cultural heritage. However, popularization and communication of cultural heritage are enabled through virtual reality (Machidon, Duguleana, & Carrozzino, in press). Existing research on cultural heritage is dominated by protection-based approach. While this research has provided valuable insights, we argue that a great deal is missed if sociological perspectives do not include proactive view and specifics of the younger generation, especially management students and their information technology skills, as cultural heritage management demands a sustainable approach and involvement of the future managers of the cultural assets. Cultural heritage attitude of the youth cannot be understood properly without taking into consideration the social world the young generation lives in (Roblek, Meško, Dimovski, & Peterlin, in press). One of the venues towards an insightful understanding of cultural heritage and management students' attitude towards it is offered by Luhmann's theory of social systems that is a complex framework. We attempt to discuss cultural heritage attitude among youth because of the focus on the future, instant satisfaction, individualism that follow imperatives of the function systems. Contemporary social systems include only the specific aspects that are relevant to their systemic operations, while excluding the rest as irrelevant. The question is then, how relevant is cultural heritage to the young generation's systemic operation? How much effort is dedicated to

the inclusion of the youth in cultural heritage management? Is youth trusted with managing cultural heritage or kept at the borders of being its admirer?

Systems approaches (Schirmer, & Michailakis, 2018) that take a holistic view and address fundamental issues are likely to result in greater success than focusing solely on cultural heritage. That is why we focus on students' attitude towards sustainability and social change. An integrated set of requirements for cultural heritage management and organization system (composed of key stakeholders, including the (pro)active role of the youth) is proposed that has potential to be a facilitator of social change.

Organization is the pivotal variable in research on how organizations aim to impact society (Mair, Battilana, & Cardenas, 2012, p. 364). Perrow (1991) proposed a focus on organizing for society instead of researching a society of organizations, whereas Mair et al. (2012, p. 364) propose "entrepreneuring for society". Social enterprises (SE) are organizations in social change processes and represent architects of social change. SE first appeared in the management literature in 1980s (Mair et al., 2012, p. 354). SE primarily pursue a social mission and aim to transform their social environment (Mair et al., 2012, p. 353). Change in the society is the essence of SE's effort (Christensen, Baumann, Ruggles, & Sadtler, 2006). By doing this they often overcome established way of doing business as they span sectoral boundaries (Austin, Wei-Skillern, & Stevenson, 2006), use different legal statuses, such as for profit, non-profit and hybrid (Dorado, 2006) and are organized in different ways, such as alliances, joint ventures, partnerships (Seelos, & Mair, 2007). SE in solving a problem first interpret and redefine a social challenge that was not so far properly approached by other organizations (Mair et al., 2012, p. 354), therefore we propose that SE are one of the options of involving management students in managing cultural heritage, first by raising awareness about social problems and then giving them the theoretical and practical opportunities to be active, whether in the form of critical thinking, volunteering or activism. Mair et al. (2012) found heterogeneity (SE models are configurations of issues, constituents and actions) and transformative ambition in the organization scheme of SE through economic activity by paying attention to the local community where this activity is embedded in. Our paper aims to research what is the strategic intent (professional orientation) in terms of cultural heritage protection perception of business students. The theoretical part of the paper presents the concepts of the human resource management that are important for preparing a conceptual model of the challenges for creating new jobs for young people with the implementation of the social entrepreneurship projects. We will conduct a survey among management students at the Faculty of economics University of Ljubljana in the study year 2018/19. Practical implications will be focused on talent development within social enterprises, dealing with cultural issues in Slovenia, where we specifically identified two social change entities – Hiša Society and Salon of Applied Arts.

The reported benefits of cultural heritage management include reduction in costs. However, significant potential has yet to be unlocked in relation to the sharing of the responsibility between cultural heritage stakeholders, older and younger generations. There is the need for theoretical guidance that can serve as a basis for managing cultural heritage in intergenerational setting. The paper emphasizes the following issues in relation to cultural heritage and social change: elements of cultural heritage; challenges identified in managing cultural heritage; the importance of

sharing responsibility for cultural heritage management; use of the information and communication technologies to support cultural heritage management.

Research questions of our study are: Do business students have the wish to solve social problems? and What is management students' attitude towards cultural heritage?

Methodology

We use content analysis and generate categories from the received answers to the questionnaire. We allow categories to emerge from our analysis of the qualitative data. Categories are constructed within their own context and formulated in terms of raw material and proof citations. That kind of inductive open coding procedure is appropriate for theory-building (Locke, 2001). We develop codes directly from the text by selectively reducing them into meaning units, which are then abstracted and labeled (Mair et al., 2012, p. 357). Our paper uses qualitative research methodology. We have designed an open-ended questionnaire based on Dees (2012).

Keywords: *empathy, sustainable well-being, scaling, social entrepreneurship*

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TOURISM AND SMART LAND

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Ab.26

A network analysis to evaluate tourist systems

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ABSTRACT

Tourism is a phenomenon that has been analyzed over time from different points of view: economically, socially, geographically, etc. However, we also find another perspective which, due to its originality, is becoming increasingly important in the analysis of the tourism sector: General System Theory (GST), by Ludwig von Bertalanffy [1]. This theory allows us to see tourism systems in a global way, as sets of variables related to each other. In this sense, we can find different authors who study tourism systems from the GST [2-5]. For these authors, a tourist system consists of a totalizing reality, with certain characteristics deductible from the variables and relationships that make it up.

On the other hand, the tourism sector is a system that belongs to the Big Data era, since it is capable of generating a large volume of digital information that makes the process of managing and analyzing it difficult [6, 7]. We therefore need a methodology that is capable not only of working with large amounts of tourist data, but also of discerning the networks, connections and trends that underlie these data.

In this article we will try to apply a predictive technique based not only on the GST, but also on a qualitative version of the Chaos Theory [8-13], with the main objective of locating the sets of attractors associated with different tourist systems.

The tourist systems under analysis will be selected from official databases provided by organizations of notable renown in the field of tourism. Finally, we will proceed to the analysis of the attractors of the systems using *Smarta*, a causal analysis simulator implemented by our research group. In addition to locating the attractors, this software will also allow us to discern the graph associated with the tourist system (representation of the network of variables and their relationships), thus allowing us to obtain the tourist variables that are most relevant within the system.

Keywords: *tourist system, General System Theory, Big Data, Chaos Theory, attractors.*

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Ab.27

The contribution to the sustainability of hotel chains: non-financial report analysis

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ABSTRACT

In a highly dynamic tourism system, business leaders also implement sustainability as an engine for company growth, the integration process is focused on the involvement of all the functions and organizational levels of new values and principles that can guide the behaviour and daily work of all subjects involved, (World Bank Group, 2015). Business improvement can strengthen relationships with stakeholders and gradually transform the company into an integrated organization capable of generating long-term profitability while simultaneously highlighting the human side of corporations and the personal commitments of their leaders towards contribute to the community and society of which they are part.The business ethical activity could be nullified if it were not able to generate wealth for itself and for the other stakeholders giving added value to the economic-social system and its business would be at risk compared to its stay in the social fabric, Beckman T. (2015). Therefore, tourist strategies should not only focus on visits, but also include the full range of impacts such as overcrowding, environmental problems, safety and security of visitors, problems of seasonality and extensibility to local culture (Evans, et al 1995). In a CRS context a tourism marketing strategy should allow managers and planners to identify appropriate target markets and maximize local economic benefits without jeopardising local resources. "An appropriate communication strategy should support the destination authorities to transmit their message and promote environmentally friendly practices at the local level", (Buhalis 2000). To successfully implement sustainable tourism is required integrated vision, policy, planning, management, monitoring, and social learning processes. Indeed tourism has been considered an easy means of improving a community as a better place to live and generating economic benefits (Hwan-Suk Chris Choi & Ercan Sirakaya 2005)

. If the tourism is an important factor that contributes to economic growth of localities and "driving force behind the propagation of values that underpin mutual understanding and peaceful coexistence in an increasingly globalised reality" (Bohdanowicz & Zientara, 2009) the Hotel chains, like multinationals, through CSR can influence many factors of sustainability. The variegated offers of tourism and reception methods are an important tool for reaching the 2030 Goals. In this work, the commitment of international hotel chains has been privileged in consideration of their peculiarities and the supremacy of operating as global multinationals. So hotel chains are obliged to adapt to different needs and cultures of the host countries.

In this work we present companies that have close contact with the territory, support environmental protection campaigns and support the host populations by integrating them in their production activities. we will also analyze the contribution to some of the United Nations' sustainable development goals of 2030, (Gazzzola & Querci 2017). The CRS reports of the

Melià and Mariott hotel chains will be a tool to outline the strategies adopted and their commitment to the development of the companies in which they operate under too the aspect of the Goals 2030.

Keywords: *hotel chains, tourism marketing, CRS, Goals 2030, sustainable tourism.*

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Ab.28

Reconsidering the tourism development in the Italian Alps: the dilemma between traditional models of development and more sustainable one

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ABSTRACT

Until recently, tourism development in many mountain areas, including the Alps, has been characterized by the development a broad number of activities that enable tourism destinations to provide a superior level of tourism offers. This approach, that can be define multi-activities approach incudes the development of accommodation and catering, outdoor activities, national parks, and ski resorts to support traditional practices (Godde, Price, & Zimermann, 2000) in generating enough income for an economically sustainable development of destinations. According to Godde, et al. (2000) although the theory shows that different could be the activities to be developed to promote and support this development; ski resorts have been the more successful in this regard. The development of destination through ski resorts has many positive impacts on regions: e.g., provide a sense of psychological stability, generate revenue diversification, and infrastructure development and improvements (Lindberg, Snowdon, Slee, Farr, & Godde, 2000; Barbier, 1993). Although the benefits of the development via ski resort are visible, it has been as well proved that the effects of this development are not wide spread. The positive effects remain within the areas were the ski resorts are located, with employment benefits in the tertiary sector and employees recruited from other regions since locals are not trained enough and younger generations are employed elsewhere and in other sectors (Pechlaner, & Tschurtschenthaler, 2003). In addition to this environmental damage and landscape changes (Needham & Rollins, 2005) and degradation of cultural heritage (Haimayer, 1989; Kariel, 1989;

Jamal & Getz, 1999) are as well visible. The development of tourism without maintaining a balance with the primary sector is detrimental to the entire mountain area. As a matter of fact the primary sector development, by maintaining settlements, ensure landscape (thanks to the pastoralist circle as per Adler, Raff, & Lauenroff (2001), cultural landscapes conservation, and enables to avoid excessive dependence on tourism (Wyder, 2001). This in turn creates disagreement between those who support this tourism development and those that reject it with the result of creating conflicts (Weaver & Lawton, 2001). This might bring to question whether this type of development is actually genuine for all destinations in the Alps or whether some areas could develop different type of tourism that could be much more aligned with sustainability principles (UNEP, & UNWTO, 2005; Weaver, & Lawton, 2005) and the principle of slow tourism and eco-tourism (Donohoe, Needham, 2006; Dickinson, Lumsdon, & Robbins, 2011; Caffyn, 2012; Richins, & Hull, 2016). Although its limits this type of tourism has been as a matter of fact proved to be successful for some destination and for specific targets (Nyaupane, & Thapa, 2004; Kiss, 2004; Coria, & Calfucura, 2012;). Thus the aim of this paper is to explore further how tourism development can take into consideration these principles, what are the factors that influence it and how it is possible to tackle the dilemma between developing and improving tourism through the development of ski-resorts or through alternative tourism development. This to be able to understand whether now, more than ever, a sustainable tourism offer could be able to compete with traditional ways of tourism development also in the light of changed tourists' requirements. Tourists more than ever ask for more ethical and sustainable practices and they are willing to take into consideration this aspect in their tourism purchase behaviours (e.g. ethical travellers as per Amadeus, 2015). Under this perspective this study focuses on the fragile alpine ecosystems of the Italian Alps and it will take into consideration some specific cases that at the moment are at the crossroad between the two different types of development previously suggested.

Keywords: *mountain tourism development, ski resorts development, sustainable tourism, ecotourism*

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Ab.29

Rediscovering cities living for sustainability

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ABSTRACT

Cities of the future should be sustainable, knowledge and innovation oriented, technology-enabled cities that proceed towards the development becoming communities that rediscover a new urban identity and enhance social, economic and human urban ecosystems to promote economic growth and support processes of value creation within society improving the quality of life, following a smart approach to urban growth, stimulating an active citizen participation in order to achieve long-term results and successful issues. This study aims at identifying an interpretive framework to rediscover cities as sustainable communities that develop and evolve relying on adopting and following a smart approach to redesigning urban growth and services, promoting innovation as knowledge-based cities and sustaining the role of municipal institution and citizens' participation to enhance urban governance. As designing the future development of urban ecosystems, cities should become smart communities that use and develop the potential of information technology to create and use knowledge sources, to design health, culturally strong, diverse and exiting places to live, work and play reinforcing the urban identity and citizenship driving the urban community to proceed towards social, economic and public value co-creation by involving local government, business, healthcare, education and research institutions to work together and form successful alliances to develop processes oriented to cooperation and collaboration to enable positive transformation of city as a community becoming smart and proceed towards sustainability. Cities as smart communities promote economic development, job growth and sustain high quality of life. Cities evolve as communities that change and re-plan themselves over time constructing meanings and value as meeting places to create value. Cities are increasingly becoming the centers and engines of social, cultural and economic development within global, knowledge-based and technology-oriented society. Driving urban growth and sustainable ecosystems relies on rethinking cities to drive social and economic development and design a sustainable future for communities oriented to value creation within urban ecosystems. Sustainable cities strengthen social interaction and innovation, engender creativity improving and extending the wealth of people within communities emerging as meeting places and spaces that sustain learning and education, cultural renewal, as services providers and incubators for economic growth and agents of social change and innovation. Sustaining smart growth relies on revitalizing social, productive and economic growth in urban areas by designing and reinventing smart cities and communities that develop digital service platforms to positively exert influence on the urban ecosystem as a source for value creation and enabler of urban identity and development. Cities as social organisms exert influence on the quality of life for people living and enterprises doing business within urban ecosystem and using new interactive and digital

information and communication technologies (ICTs) that provide platforms to design social, cultural and economic development and growth. The main contribution of this study is to identify the sources (technology, knowledge, participation) that drive and enable cities to reinvent as communities that shape the urban ecosystems rediscovering better opportunities to improve urban competitiveness and create a livable urban environment attracting skilled people and involving people aware to participate and contribute to enhancing the wealth of cities. Designing a path for sustainability relies on cities that involve and engage citizens aware to participate and feeling to belong to the city as a source of meanings and identity, and driver for value creation. Technology helps to drive cities towards sustainability by mobilizing internal and external sources opening up to the involvement of stakeholders to enhance participation and governance, to provide smart services and create, manage and use knowledge to develop innovation and support social and economic growth. Sustainable cities as urban living organisms that design long-terms policies driving change and sustaining a continuous development and innovation should promote trust-based relationships and sustain citizen participation in policy choices to develop smart governance that leads to new roles and mechanisms that enable engagement and participation enhancing the dialogue with citizenry. Designing sustainable cities relies on developing a smart approach for enabling the creation of social and public value driving an enduring urban development over time. Sustainable cities develop the city as a smart community oriented to create value and wealth over time and where city government, people, business, research and education institutions cooperate for creating public value by strengthening social and economic innovation and growth, and defining policies for constructing future development perspectives.

Keywords*:* *urban ecosystem, smart cities, knowledge cities, sustainable cities.*

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Ab.30

Tourism as form of personal liberty and general communication

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ABSTRACT

The artificial city world created for several millennia is very unstable. In ecology the instability of artificial objects, including a cultural landscape, is explained by need of power costs of maintenance of their quality. According to authors, one of the main reasons of this instability is also the limitation – creation of a set of artificial borders which break the system of external and internal relations. In geography the question of borders is considered on the basis of idea of geographical space – hierarchically constructed system which is characterized by discontinuity of bodies and a continuity of the relations. The nature of a manned part of a geographical envelope of Earth is distinguished by the increased dynamism especially noticeable at comparison with planetary and space processes. The gradualness of transitions between elements of natural systems provides their elasticity. The infinity of spherical space determines the pro-accuracy and integrity of global natural system and a variety of structure carries out a role of the buffer mechanism and protects from a resonance. In such context the general stability of global socially-natural system can consider development of tourism as the effective mechanism of restoration of communications, therefore. The freedom of movement on the planet allows realizing natural aspiration to knowledge of the world, peculiar to the person by nature. Freedom of personal contact restores trust and mutual understanding which are so necessary for us.

Keywords: *tourism, geographical space time, communications, system communications, sustainable development.*

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Ab.31

Smart Land: towards intelligent and resilient territories to enhance sustainable tourism development

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ABSTRACT

In recent years, Smart City asserts as the new emerging paradigm for the urban environment of tomorrow (European Commission, 2013, 2016; UN-HABITAT 2016). Next to the technological dimension, essential to enable the planning of intelligent cities and territories, sustainability has become a focal point in urban and community development policies, in line with a vision of long term development based on a close integration between economic and social development, technological innovation, environmental sustainability and land identity (Sharpley & Telfer, 2015, Tollin N., Hamhaber J., 2017, Benevolo, Dameri, 2013). The smart city paradigm can be successfully extended to wider areas related by socio-economical homogeneity bringing to the smart land concept (Cialdea, 2018, Bonomi M., R. Masiero 2014). A smart land is a territorial area in which, through widespread and shared policies, the competitiveness and attractiveness of the territory is increased, with particular attention to social cohesion, diffusion of knowledge and innovation, creative growth, accessibility and freedom of movement, to the usability of the environment (natural, historical-architectural, urban and widespread) and to the quality of the landscape and the life of citizens (Sikka, Islam & Rao, 2018; Pezzetti, 2018). Smart Land brings with it an idea of growth and awareness of the territory where sustainable tourism can develop, as the first place from which to start and on which to try to invent and graft new and widespread forms of government, entrepreneurship, sociability, innovative forms of collaboration between public-private subjects and networks (Pavione, Pezzetti & Gazzola, 2017). Tourism, for the size it has assumed and for its role in the economies has a profound and wide-ranging impact on societies, the environment and the economy (Hall, Scott & Gössling, 2013); by representing 10% of world GDP, 1 in 10 jobs and 7% of global exports, tourism has a decisive role to play in the achievement of the 2030 Agenda. Tourism's role in achieving the 17 Sustainable Development Goals (SDGs) can be significantly strengthened when sustainable development becomes a shared responsibility and moves to the core of decision-making within the tourism sector. Actually the

promotion initiatives of tourism seems to concentrate exclusively on the city and land branding, rather than on initiatives to make cities and lands able to support an additional urban load expressed by the tourism demand. Yet, potentialities of the application of new technologies and innovation advancement could strengthen the decisional role in defining adequate urban and land policies to manage tourism and to optimize the supply of services and new facilities (Lv, et al., 2018). In this contest, sustainable tourism could acts as a means not only to preserve and valorize cultural, the local identity and the natural heritage, but also for experimenting new models of resilient and inclusive growth by innovating the forms of social entrepreneurship, governance, and cooperation among all public-private players of the ecosystem of innovation (Gazzola, Pavione, Grechi & Ossola, 2018; Pavione, Pezzetti, 2017). The development of sustainable tourism can represents a tool for advancing urban infrastructure and accessibility, promoting land regeneration and preserve both cultural and natural heritage, assets on which tourism depends. Investment in green infrastructure (more efficient transport, reduced air pollution) should result in smarter and greener cities and communities for, not only residents but also tourists (Billi & Tricarico, 2018). Tourism policymakers must also strengthen their dialogue with other public actors, the private sector and other relevant tourism stakeholders to take advantage of tourism's interlinkages with, and impacts on, other sectors and industries. Similarly, addressing the challenges and threats of tourism requires integrated policies that fully take into account tourism's cross-cutting impacts on the SDGs. At present, land smartness for tourism seems to be concentrated on the amount of apps available to enhance the use of specific resources (Kaur & Kaur, 2016) or, more rarely, of the urban mobility systems (Allis & Fraga, 2018). Within this current framework, the paper aims to analyze the main challenges and opportunities for supporting sustainable tourism development within the framework of a new growth paradigm that is articulating around concepts of smart lands and smart communities. A theme of increasing topical not only with reference to major cities and towns, today already engaged in projects aimed at the realization of new smart tourist districts, but that more and more open to experimentation on smaller rural and mountain territories in which cultural, productive, technological and scientific excellence are often rooted.

Keywords: *smart land, sustainable tourism, resilient cities, slow territories, public-private partnership, innovation models*

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Ab.32

Assessing Student Learning Gain and Confidence Gain in Higher Education: removing the borders between teaching practice, teaching evaluation and quality assurance

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ABSTRACT

This paper details the most recent results and outputs of a research project aimed at investigating the concept of 'learning gain' as a metric encompassing pedagogical effectiveness and teaching quality assurance.

After the publication of research by Arum and Roksa (2011), Higher Education institutions in the Western World have been under scrutiny. Their book 'Academically Adrift', reports on data gained from more than 2,300 graduates at 24 American institutions to highlight that 45% of these students did not experience an improvement in a wide range of skills including critical thinking, reasoning and writing during their time at college. Paired with soaring costs in fees, Arum and Roksa's findings challenged the worth of investment in higher education, and sparked concerns about the quality of learning and teaching practices in the sector, as well as how these practices can be evaluated.

Responding to these concerns, the international pedagogical debate has registered increasing interest in defining, measuring, and evaluating the impact of different pedagogical approaches to student learning. Whilst the Organisation for Economic and Social Development embraced the broader approach of 'assessment of learning outcomes' (OECD, 2014 and 2011), the American and British literature focussed more tightly on the concept of 'learning gain'. Within this context, the debate on learning gain tackles the validity of metrics based on student performance taken at distinct points in time over a student's educational journey (McGrath *et al*., 2015). In order to investigate the concept of learning gain, the Higher Education Funding Council for England funded a national project aiming at "Piloting and Evaluating Metrics of Learning Gain" (HEFCE, 2015). The University of East Anglia (UEA) was one of the participants to this project.

The UEA approach builds on the consideration that, while the debate on learning gain focusses predominantly on measures of student attainment, little attention has been devoted to other important dimensions of learning, such as student self-assessment skills (Taras, 2015; Henderson and Harper, 2009) and student self-efficacy (Bandura, 1977 and 1997; Pajares, 1996). We argue

that students' ability to reflect on their performance, and form positive beliefs on their educational experience, represents an important catalyst to learning, and should also constitute a learning objective on its own (Ritchie, 2016). This, in turn, can support Self-regulation behaviours (Zimmerman, 2002), as well as Student Motivation (McMillan and Hearn, 2008).
In response to the need for developing, assessing and evaluating the formation of students' meta-cognitive skills, we developed a teaching approach that aims at enhancing students' performance as well as students' awareness about their own skills. Our teaching strategy relies on a well-established flipped classroom approach, which combines formative quizzes, Peer-Instruction (Mazur, 1997), and self-assessment components (Aricò, 2016). In practice, the pedagogy analysed in this paper relies on an algorithm that alternates formative assessment questions, self-assessment questions, and Peer-instruction moments, in a sequence of learning cycles iterated over the duration of each flipped classroom session. Thus, using data collected in the classroom, we proceed to evaluate the impact of our teaching approach constructing two measures of learning: one related to attainment, and one related to self-efficacy and self-assessment skills.
Our first research objective aims to uncover whether students develop self-assessment skills in this innovative pedagogical set-up. Our second research objective is a characterisation of the patterns of learning gain and confidence gain as a function of previous knowledge and skills. Finally, our third research objective is to investigate the correlation between learning gain and confidence gain.

Our analysis stems from a rich dataset collected over the teaching of a first year, year-long, undergraduate module in Introductory Macroeconomics at UEA in 2013-14, 2014-15, 2015-16, and 2016-17, with cohort sizes spanning between 180 and 250 students. Complying with a sound ethical framework, and an informed consent protocol, students are assigned a personal Student Response Systems (SRS) device as they enroll in the module. SRS devices are used to promote teacher-student interaction and conduct formative assessment quizzes. Thus, our dataset tracks individual student responses over the whole duration of the module. The Introductory Macroeconomics module is characterised by a rich learning environment composed of lectures, small-group seminars, and large-group workshops, where the Peer-instruction and self-assessment pedagogies are implemented. Students are initially presented with learning material delivered through 'traditional' lectures. Following this, students participate in workshops where they are exposed to a number of multiple-choice formative assessment questions, and self-assessment questions. Through the aid of SRS, students interact with the teacher according to the following algorithm. Students: (i) give a first answer to a question, (ii) evaluate their performance for the answer just given, (iii) compare and discuss their answer with their peers, (iv) give a second and final answer to the same question, and (v) re-iterate self-assessment, reflecting on their ability to tackle similar problems in the future. As a new learning cycle begins, the algorithm is repeated for either 8 or 10 questions per session, and for a total of 8 sessions per academic year. To operationalise our measure of learning gain, we compute the difference between the proportions of correct responses to formative questions, as they were given before and after Peer-instruction. At the same time, to construct a measure of student confidence gain, we compute the difference between the proportion of confident statements at the beginning and at the end of each learning cycle. Thus, we explore the correlation pattern of our learning metrics.

The results of our investigation uncover that: (i) when engaged with our active learning pedagogy, students develop good self-assessment skills; (ii) learning gain and confidence gain are

maximised when previous knowledge and perceived skill-mastery are unevenly distributed in the classroom. Finally, we demonstrate that learning gain and confidence gain are positively correlated, and that the strength of this correlation is robust to slight modifications to our teaching algorithm.

Our findings confirm that our pedagogical approach facilitates the creation of a learning environment where students can develop metacognitive skills, such as self-assessment and self-efficacy, along with their knowledge of the discipline. With the support of learning technologies, this learning environment allows lecturers to assess the effectiveness of their teaching sessions, enhancing their practice in real time. Ultimately, the collection of a large base of learning data, also facilitates the analysis of metrics for pedagogical effectiveness that address quality assurance needs in an innovative and efficient way.

Traditional quality assurance methodologies involve the analysis of grade progression, student surveys, and external examiners reports, which are developed outside the learning environment and distant from students' learning experiences. In contrast, our approach breaks the borders between teaching practice, teaching evaluation, and quality assurance assessment, by appraising teaching as it happens. Our methodology is able to tackle large cohorts of students and it is scalable across a wide range of different disciplines and teaching scenarios. For all these reasons, we advocate that further research and further investment should be devoted at exploring similar high-powered pedagogies that can bridge the gap between teaching practice and its evaluation in both an effective and an efficient way.

Keywords: *learning gain, self-assessment, self-efficacy, learning analytics, quality assurance*

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Ab.33

Integrated Reporting and Risk Disclosures in South African Public Higher Education Institutions

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ABSTRACT

The concept of integrated reporting was introduced in the South African reporting arena in the King Report on Governance for South Africa in 2009 (King III Report) (IOD, 2009; Makiwane & Padie, 2013). The release of this report, brought about a change in the reporting of organizations relating to their accountability towards different stakeholders, and placed focus on the idea of integrated thinking. Subsequent to the King III Report the establishment of the International Integrated Reporting Committee (IIRC) in 2011 and through an extensive consultative process, this committee developed and issued the Integrated Reporting Framework (<IRF>). In 2014 South Africa expanded on the integrated thinking and integrated reporting concepts with the issue of the fourth King Report on Corporate Governance in South Africa (King IV) (Crous, 2017; IOD, 2016). This report intended to alleviate the uncertainties in the application of the integrated reporting and governance principles contained for all South African organizations. Additional to the reference of the concepts of integrated- reporting and thinking, the King IV report also provides enhanced disclosure recommendations that may assist organizations in their endeavor of accountability towards stakeholders.

As the majority of public universities globally, receive their funding mainly from government subsidies, the reporting to stakeholders on the use of resources and capitals become increasingly important. The need for accountability and transparency in South African Universities were further exacerbated by the #feesmustfall campaigns in 2016 and 2017 and the announcement of Free Higher Education for all in 2017 by the South African President. To assist South African Universities in the endeavor for accountability and transparency, the South African Department of Higher Education and Training (DHET) requires public funded universities to comply with the Annual Reporting Regulations as set out in the Higher Education Act 101 of 1997 (RSA, 1997). Only in 2014 these reporting regulations were adjusted to conform to the requirements of the 2009 King III Report, leaving the Higher Education Sector in South Africa at a disadvantage relating to accountability and transparency.

A fundamental concept contained in both the <IRF> is the inclusion of disclosures relating to the risks and opportunities that faces an organization and how the they effect the organization's ability to create value over the short-, medium- and long term (IIRC, 2013). The disclosure of the risks and opportunities are also recommended in the King III as well as the King IV Reports in South Africa (IOD, 2009, 2016). The South African Reporting Regulations, however, only require public universities to disclose risks and is silent on the aspects of disclosures of opportunities.

The purpose of this study was to determine, through document analysis, the extent to which the 25 Public Funded Universities in South Africa apply the current Reporting Regulations, which is based on the King III Report, to identify whether or not any of the public funded universities in South Africa are ready to apply the enhanced disclosures contained in the King IV Report on Corporate Governance and to make recommendations for the adaption of the reporting regulations to confirm to the King IV and <IRF> disclosure principles. It was found that, although disclosures relating to risk management by South African Public Universities doubled from 2011 to the 2015 financial years on average the Universities disclose less than 50% of the required information contained in the Reporting Regulations. Additionally, there were only two public funded universities who demonstrated that they are ready for the application and disclosures of risks and opportunities as contained in the King IV report and <IRF>. It was further found that risk reporting, was still done in silos and not in the integrated manner that the <IRF> recommends. This may be attributable to the fact that the current Reporting Regulations for Public Universities are still based on the King III Report and not the King IV Report. The reporting regulations therefore need to be revised to conform to the King IV Report on Corporate Governance, and more importantly, to the <IRF>.

Keywords: *Integrated Reporting, Corporate Governance, Disclosures, Public Universities, South Africa, Risk and Opportunity Management, Annual Report, Reporting Regulations, King III, King IV.*

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Ab.34

Taking social network analysis one step further: determining employees' loyalty by informal knowledge sharing networks in college

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ABSTRACT

Employees are a fundamental element of business processes, which is the reason for keeping track of them by managers (Ruck&Welch, 2012). Engaged employees follow company's values and appreciate the corporate "climate" (Harter, Hayes & Schmidt, 2002). In a long-term perspective, the level of engagement also affects employees' attitude and trust to the supervisor and, as a sequence, an overall loyalty to the organisation.

Employee's loyalty has been previously studied in the framework of such disciplines as internal marketing, sociology and psychology. Researchers state that control and evaluation of employee's satisfaction are of importance for business (Rachel, Yee & Yeung, 2010, Harsky, 2003, Hajdin, 2005). Employee's loyalty has a substantial impact on business outcomes (Harter, Hayes & Schmidt, 2002). However, these studies do not take into consideration social networks among employees as one of the aspects influencing loyalty level. Moreno (1951) and Wasserman (1994) determined the crucial role of social networks in understanding formal and informal communication structure and establishing the productive system of cooperation in a company. These networks have different nature: some serve as an informal knowledge transfer; some provide us with information about informal leadership structure.

This research is aimed to identify and explore the nature and the features of the relationship between employee's satisfaction, loyalty and informal communication structure in an educational institution. We address networks from two perspectives: knowledge transfer (work-related communications), informal leadership (trust communications). The unit of study is an employee (teacher, manager, specialist) from one of the colleges in St Petersburg, Russia. This research has a case study design, but the results may be generalised to other educational institutions (schools, colleges).

In our research employee loyalty is presented as a set of employee's characteristics caused by his/her qualities (internal factors) and organisational qualities (external factors), which influence

the attitude, the behaviour and the intentions of the employee to the organisation in the current and long-term period. To collect quantitative data on employees' loyalty and satisfaction we created an offline-distributed questionnaire. The questionnaire consists of three groups of questions, each one taking into consideration unique features of the educational institution (college). We use NPS (net promoter score) and JDS (job diagnostic survey) as a basis for the questionnaire (Hackman & Oldham, 1975).

In order to depict and to measure the structure of informal communication, we address the social network theory. Organizational structure is a regulated system of stable relations between all elements of the organisation, both subdivisions and individuals (Wang et al., 2015). The structure of communication exists in two formats: formal and informal ones. The formal one is presented in the form of organigram, and the informal has more diverse ways to be described.

Allen (2007) considers informal communication to be a platform for discussing performance appraisal and organisational management. Hitt et al. (2006) define informal communication as the patterns of communication that occur at the organisational level. Overall, informal communication is a channel between the employees in an organisation, who share information, attitude and emotions, by grouping based on shared values and ideology.

Social networks work as the mechanism of knowledge and information exchange in a company. For some people, this mechanism is a primary source of information in comparison to the appearing documents or announcements (Behrend, 2009). The importance of the social ties cannot be underestimated both for management and employees themselves (Lawson et al.,2009). Shared social ties result in similar views and attitude towards different aspects. That is why it may also be a reason for a level of loyalty (Tamer et al.,2012).

Hanneman (2001) distinguishes two ways to visualize the informal ties between employees: graphically and in a table format. Moreno (1951) offered the most commonly used way to visualise and analyse social networks of employee – sociometry. Sociometry is the instrument for measuring the interpersonal connection between people. It evaluates and presents every interpersonal link and creates the overall picture of the informal social network within the group.

Behrend (2009) describes sociogram as a typical and visually understandable way to show the information about members' identification of each other and number and firmness of ties between them. Such scheme reflects the information about the levels of authority and knowledge-exchange channels among participants. Sociogram provides managers with an insight of the existing informal networks and, therefore, makes it possible to transfer information in the specific direction to ensure its correct spreading. For such manipulations, it is worth identifying the core of each community. Identification is possible by testing links using the method suggested by Grivan and Newman (2002), who build the original map by detecting most central and most distant edges and cluster them on the hierarchy. Also, Wasserman and Faust (1994) offer a set of indicators for measuring informal relations in the sociogram – centrality indices. We use two groups of sociometric questions to measure trust-related and work-related networks. In-degree, out-degree and betweeness indices are used to depict quantitative measures of networks.

The population consists of 50 employees of one of the professional colleges in St Petersburg, Russia. The group of employees is represented by foreman (instructors or masters), subject teachers and administration and specialists. Each member of the population received a questionnaire, so the initial sample method is the census.

We use multivariate linear regression with control variables to explore the nature and the features of the relationship between informal communication structure indices and satisfaction indices and

level of loyalty. Sex and job position were recoded to binary variables to control the effect. Models including in and out-degree indices were not statistically significant.

Results

1) The higher the level of work relationship involvement (betweenness), the higher employees are satisfied with the administration of College. According to the value of standardised regression coefficient, the betweenness is as important as experience in College to predict satisfaction about the administration. Work experience and position effects are also present and statistically significant, whereas gender effect is not.

2) The higher the level of trust relationship involvement (betweenness), the lower the NPS, overall satisfaction with colleagues, attitude towards college. Work experience and income level effects are also present and statistically significant. We notice that the sign of the relationship between informal communication structure and satisfaction/loyalty changes once we change the nature of the relationship from work to trust. We call this effect satisfaction hypocrisy. Employees are less satisfied/loyal to the college, colleagues and superiors if they keep trust-related communication in mind. Moreover, on the contrary, employees are more satisfied with superiors if they discuss work-related communication.

3) Work experience (amount of years in College) has the significant effect on different loyalty measures in all models. Work experience plays the most valuable role in predicting overall attitude towards College and employees (colleagues).

4) Trust relationship (questions) are more suitable to measure the relationship with the loyalty indices in comparison with work-related communication.

Keywords: informal communication, knowledge sharing, social network analysis (SNA), secondary education, employee satisfaction.

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Ab.35

The students' attitude toward knowledge and the future of work

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ABSTRACT

The paper aims to present the attitude of the secondary school students to knowledge sharing in the knowledge economy. In the context of the increase of life expectancy and of fast technological and cultural (ex)changes, the new generations of students should enroll in university and be open to lifelong learning (European Commissions, 2010). Nevertheless, numerous studies have shown that students are less and less interested in theories and expect that school and university to share more practical skills (Brătianu and Vătămănescu, 2016, Buzionelos *et al.*, 2016). Moreover, some papers raise the issue of students' anti-intellectualism (Elias, 2008, 2009, Frunzaru *et al*., 2018,), thus students are rather less interested in 'the life of the mind' and value less learning for its own sake (Eigenberger & Sealander, 2001).

Besides this attitude toward knowledge and educational organizations (school or university), millennials or generation Y, the new generations born after 1980 (Lester *et al*., 2012), are more interested in extrinsic reward and leisure time (Twenge *et al*., 2010) and consider 'a real job' rather boring and stressful, thus the main motivation at work is salary and medical and retirement benefits (O'Connor and Raile, 2015). Other studies give evidence that millennials are not less work orientated (Pyöriä *et al*., 2017) and negative attributes associated to millennials are just popular stereotypes (Hansen and Leuty, 2011; Milkman, 2017). Therefore there is not a general support for significant differences between generations regarding work attitude and job expectations. Moreover, there are researchers that consider the generation born after 1995 as a distinctive generation called generation Z (Kubátová, 2016; Ghura, 2017).

Academics that approach the future of work do not have any general agreement, as well. When Jeremy Rifkin published in 1995 the book *The end of work*, where he anticipated the decline of the labour forces due to machines and information technology, some critics considered this publication as neo-luddism (Jones, 2006). Later on, Carl Benedikt Frey and Michael A. Osborne (2013) examined the probability that jobs to be computerised and they found that 170 of 702 examined jobs have probabilities more than 0.9 to be done by machines. Furthermore, the technological changes have an impact not only on labour market but on the overall society; together with other factors (i.e. globalization, the decline of the middleclass), the labour market changes make Immanuel Wallerstein *et al*. (2013) question if capitalism has a future and if it has one what it would be.

In this complex and partially contradictory picture, the paper examines the attitude of the secondary school students to knowledge and their expectation to labour market. The research

consists in a survey on secondary school students (n=634) and SPSS was employed to test the reliability of the scales that measure the anti-intellectualism, the attitude towards lifelong learning, the attitude toward university, the attitude toward job flexibility, and to run multiple linear regression and t test for testing the hypotheses. A particular focus was done on gender disparities due to that there are more male early school leavers and more female aged 30-34 that attained tertiary educational (Eurostat). The findings show the need to increase secondary school students' awareness regarding the importance of knowledge (both theoretical and practical) and that university should offer a proper balance between specific knowledge needed for a particular task and general knowledge needed for the adaptability in a changing labour market. These challenges bring into question the future of university that should offer well educated graduates for the labour market; they have to know more than how to do things, they should be creative, critical, and interested in intellectual development. Therefore, graduates should be ready to acquire knowledge during their entire life both for employability and to become responsible citizens within democratic society.

Keywords: *knowledge sharing, secondary school students, students' anti-intellectualism, lifelong learning, future of work.*

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Ab.36

Exploring the possibilities of reducing the education gaps in Romania by improving teachers' motivation

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ABSTRACT

According to human capital perspective, education is an investment of current resources (time, effort, money) in exchange for future returns (Harmon, Walker & Westergærd-Nielsen, 2001, p. 3). In the studies which explored the benefits of education, results showed that individuals with a higher level of education had a better position on labor market or increased earnings (Card, 1999, Rouse, 2005), and had an increased social mobility (Buchmann & Hanum, 2001, p. 89). At a social level, education has a positive influence on the economic growth, and improves the well being of societies by forming informed consumers and responsible citizens, decreasing crime and increasing the democratic participation (Wolfe & Haveman, 2002; Lochner, 2011).

Several studies from the socio-economical field calculated the impact of education completion on individual earnings. On the other hand, only 50% of the individuals without high school completion were employed, in comparison with 69% from the individuals with a high school degree, and 75% from the individuals with at least high school diploma (Rouse, 2005).

The issue of education gaps has been considered a strategic problem to be addressed in future policies (Glewwe & Muralidharan, 2015). Several types of education gaps have been documented by scholars in the previous decades: social class and race as a source of gap since school's beginning in the case of American children (Rearden, Robinson-Cimpian & Weathers, 2014; Garcia & Weiss, 2015), gender inequality (Breen, Luijkx, Müller & Pollak, 2009), disadvantaged groups and poor classes (Duncan, Morris & Rodrigues, 2011)

Questioning the effectiveness of education systems, Buchanan & Hanum (2002) explored the variety of factors that shape the educational inequality: (a) macro-structural forces shaping educational stratification (education policies, funding); (b) the impact of family background on educational attainment and achievement; (c) school factors as they relate to educational outcomes; (d) the impact of education on social mobility in developing regions.

Thus, there is a circular relationship between the development of human capital and the well being level of society (Glewwe & Muralidharan, 2015, p.3). Still, the overlapping of gaps between developed and less developed societies was one of the issues in the modern literature on education. As a particular aspect, it has been observed that in the less developed countries there is

a weak conversion of the participation rate in outcomes of education (Glewwe & Muralidharan, 2015, pp.10-11).

Design of research

The paper aims to identify solutions for reducing the education gaps in Romania in the future, by enhancing the teachers' motivation. To this purpose, we conducted a secondary data analysis, using official data from UNESCO and Eurostat databases. In the first part of the study, the education gaps (among Romanian regions, or between Romania and other countries) will be identified on the basis of three key indicators: gross enrolment ratio, the average rate of early leavers from education and training, and tertiary educational attainment (and, as a support, the the structure of population by level of educational attainment). In the second part of the study, the possible solutions to reduce gaps in the future will be explored. For example, the analysis of the monthly salaries of teachers at national and European level (comparison between countries but also between different sectors in the same country show that in Romania the sectors of education and health are the sectors with the lowest level of average monthly salary. In order to build the systemic model for solutioning this issue, the Value Stream Mapping method will be used, comparing also the evolution of the "education products" (graduates of different levels of education) Romania with the similar evolution in other countries.

The benefits of the paper rely on the identification of the patterns of evolution of the "results" of educational system, and, by providing the results of comparison between several European countries, on possible solutions to decrease the educational gaps, in order to improve the human capital.

Keywords: *human capital, education gaps, participation to education, level of instruction*

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Ab.37

Knowledge Triangle – Innovation Policy Approach to Strengthen National Competitiveness

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ABSTRACT

A quick glance on global development demonstrates unprecedented economic growth accompanied by massive progress of digital technologies since the late 90s of the past century. Qualitative changes in IT equipment, which made able to widely spread electronic devises among wide range of populations, consumer-friendly settings, cheap and broad net of internet, easier available different databases and etc. accelerated diffusion of science into modern goods and services and extremely boost countries' readiness for investment in research and development. Technology achievements are becoming significant factors for economic growth. Success of the country in science and research significantly influence level of national welfare. However, the more important is to commercialize the scientific results that enables national firms to produce new products and services that are compatible in the global markets and support them to define sound positions and generate higher incomes. This mean stronger competitiveness of the country. Emergence and unprecedented wide spread of digital technologies together with such new technologies as gen-engineering, telecommunication, microelectronics, new materials, biotechnology and etc. dictates national governments to take special measures to generate knowledge and to encourage national firms for innovation as well as to take certain steps to support science and education at national level. Of course, the models, ways and policies differ according countries, as the culture, political and economic conditions vary (Sepashvili, 2016). Special attention is paid to social responsibility as the inclusive growth and sustainable development becoming decisive factor of development. Key attention should be paid to labor productivity as the main factor to support human capital development, which is imperative to generate knowledge and innovation (Gazzola at tal, 2018; Gogorishvili, 2015).

Thus, knowledge, research and innovation is decisive factor for economic development and international competitiveness. Therefore, innovative policy becomes inseparable part of modern national economic policy. Recent researches prove, that researches and innovations boost economic growth (*Cameron, 1998; Cetin, 2013; Coad, Segarra&Teruel, 2016; Furman, Porter,& Stern, 2002; Grossman, 2009 etc.). However, how to introduce new knowledge and research results into economic activities or to say in other words, how to commercializing the*

innovations is still the subject of hard debates. As UNESCO Science Report 2010 argues, "countries have been catching up rapidly in terms of both economic growth and investment in knowledge, as expressed by investment in tertiary education and R&D." (UNESCO Science Report 2010: 29). Some scientist gives key role to cluster development (Porter 1992; Wal& Boschma, 2009), some notes on mobility of labour and/or other factors, (Almeida& Kogut, 1999; Tsvetkova, 2015).

Despite the wide range of different views and opinions, it is undoubtable, that the education is the main foundation to all above approaches. The question is how to manage education in a way that will better serve to the goal of innovative economic growth and commercializing the outcomes of scientific researches. It is obvious, that only private sector cannot meet the technological challenges due to the huge financial resources that modern technological researches need and on the other hand, due to the uncertain future about further application of the scientific research results. This modern task calls the new agenda for higher education, which have complex goals to meet: 1. To develop study programs to meet the current and future demand of labour markets; 2. To support national/regional development and growing incomes; and 3. To take active part in research, innovation and knowledge generation. This new trend of so called "entrepreneurial universities", *can* dramatically guide the innovative development of economy and transform into a driving force for job creation, economic growth, and strengthening the international competitiveness of national economy (Gagnidze, 2018, Lekashvili, 2015).

Thus, the concept of knowledge Triangle – Education, Research and Innovation – is becoming key to meet national economic policy goal against the contemporary global economic development, which heavily lays on knowledge and knowledge diffusion into commerce. This approach has several expression, such as

- "Third Mission" undermining that Higher Educational Institutions (HEI) group together entrepreneurial and commercial activities, knowledge transfer and social-cultural relevance. (OECD, 2015);
- Entrepreneurial University undermining the primarily goal for HEI to undertake entrepreneurial activities based on their research results (Etzkowitz, 1983; Etzkowitz et al., 2008; Foss, Gibson, 2015; Vesperi & Gagnidze, 2018);
- Triple Helix –undermining the importance of coordination among education, business and policy-makers, civil society, NGOs, consumer organizations, ordinary citizens etc. to boost innovation and knowledge based growth (Etzkowitz&Leydesdorff, 2000; Leydes&dorff, 2012; Ranga&Etzkowitz, 2013);

European commission establishes the term "Knowledge Triangle" viewing as a part of Smart Sustainable Growth Strategy. Well-functioning linkage among research, education and innovation is considered as a key circumstance to tackle social challenge (EU Council, 2010). The national policies in line with this approach should encourage the wider spread of academic knowledge beyond research and teaching towards innovation and commercialization to foster regional development and face socio-economic challenges. Besides application of research results and commercialization, HEI have to contribute to relevant and diverse competencies, including interdisciplinary linkages and practical entrepreneurial skill development. The EU's "modernization agenda" for Europe's Higher Education Systems calls member state to take steps to ensure greater variety of study models and the improvement of specialist training programs at all levels, including doctorate in order to guarantee satisfied supply for dynamic and changing labour market demand (European Commission, 2011).

The role and functions of central/local government authorities is not easy to define and suggest a single, all-encompassing framework as the national educational systems and their funding schemes differ in a great extent. Another problem refers the approaches of national innovation policy and the ways of its implementation through ought the country. Sometimes the responsible authority for innovation policy is a single ministry, but often innovation policy represents guiding concept that unites and calls for coordination actions of different stakeholders. From time to time, this can be topic- or technology-oriented policy such as climate change, energy efficiency, green economy and etc. Knowledge Triangle (KT) concept framework is coordination activities of private sector and public sector and intensive educational involvement. This new horizontal approach prioritize social needs and challenges and their combination with research (HORIZON 2020). They may focus on different topic (math-information technology, natural sciences- technology) or may integrate innovations for the provision of education at all levels (e.g., the Dutch Technology Pact). Therefore, KT has different frameworks that depends on the institutional actors and responsible public authorities.

Thus, each country has its own approach to innovative policy. Cluster development strategy that undermines the close cooperation among different stakeholders is the key to promote better efficiency and rise countries welfare. The clusters significantly increase efficiency of relations among private sector, government, trade unions, scientific and education institutions. Public governance should facilitate innovations and create appropriate conditions and/or incentives for business actors to focus on innovative products and services. As technology, knowledge and innovations are the main pillars for raising the resource efficiency (Sepashvili, 2018), some kind of structural reforms are needed to obtain required results. Knowledge Triangle is one of the recent approaches to such strategy implementation, where key role is given to educational Institutions. Such attitude undauntedly rises the topic of human capital development and improving the skills of workers. Nevertheless, it is impossible to fully define policy efforts that are needed to meet all objectives. As a rule, policy measures target regional or particular business development. Accordingly, different activities can be applied such as making information transparent and easily available, facilitate business-to-business and people-to-people contacts, establish special funds for granting innovative start-ups, support joint marketing activities like international exhibition or fairs, and est.

Keywords: *knowledge Triangle, Innovation Policy, Higher Education, International Competitiveness, Global Economy.*

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Ab.38

University-Business cooperation - One of the way for IT innovative development of HEIs.

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ABSTRACT

In the era of the knowledge economy, higher education is a driving force for the development and competition in the world. It is regarded the "engine of economy", which promotes constant development to create new knowledge and competencies of the workforce through research and innovation (Sursock and Smidt, 2012). The McKinsey Global Institute survey shows that 44% of firms which reduced their payroll since the financial crisis of 2008, had done so by means of automation (Manyika et al., 2011). In recent years, several international reports were devoted to the issue of higher education compatibility. Among others are OECD 2011 thematic report and UNESCO global monitoring report – Education for All 2012 (Bregvadze, 2013). The pace of technological innovation is increasing which will mean more challenges for the labour market and education sector (Arntz et al., 2016). For higher education institutions (HEIs), the changes in the labour market point to the need for action in order to maintain their efforts to modernize and offer the relevant skills. The universities' role in lifelong learning varies across countries and institutions. HEIs will need to develop a field-specific (faculty-level), future-oriented analysis of the long term trends on how information technology is re-aligning work in different fields and then revise their curricula accordingly (Christine Bertra et al., 2017). The studies undertaken in Georgia demonstrate the efficiency of the cooperation between the innovator companies and the higher educational institutions.

The article gives one of the ways of innovative development of IT at the educational institutions: the cooperation between the university and the business. In this direction, the major trends and priorities of the cooperation between the university and the business in the world, including Georgia (if considering the readiness stated by the Georgian society to approximate to the European Union in respect of enhancing the higher educational quality and the actions realized by the National Center for Educational Quality Enhancement of Georgia to ensure the compatibility with the European legislation model) are considered; a situational analysis about

the higher education and labor in Georgia is given; efficiency measures and various statistical data of the higher education are analyzed and econometric models are developed. The statistical data to calculate were mainly obtained from official information sources. The article gives conclusions and recommendations regarding the innovative development of IT at higher educational institutions within the scope of the cooperation between the university and the business.

Keywords: Education, IT, Business, Innovation, HEIs.

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SYSTEM DYNAMICS

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Ab.39

Obstacles to the Perception of System Dynamics. The Aid of Systems Thinking

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ABSTRACT

According to the well-known book by Peter Senge, "The Fifth Discipline" (1990), Systems Thinking represents an efficient tool for easily building coherent and sensible models of the dynamic and ever-changing world in which people, organizations and society operate.

Systems thinking is a discipline for seeing wholes. It is a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static "snapshots" (Senge,1990, p. 68).

Systems Thinking is a Paradigm and a Learning Method. The first conditions the second. The second supports the first. The two parts form a synergistic whole (Richmond. 1994, online).

Systems Thinking [is] a way of thinking about, and a language for describing and understanding, the forces and interrelationships that shape the behaviour of Systems. This discipline helps us see how to change systems more effectively, and to act more in tune with the larger processes of the natural and economic world (Senge et al. 1994, p. 6).

In his book "Systems Thinking, Intelligence in Action" (2012), Piero Mella delineates a simple framework which defines a set of necessary and, perhaps, sufficient rules for the construction of the dynamic models of Systems Thinking.

First rule: if we want to understand the world, we must be able to «see the trees and the forest»; we must develop the capacity to "zoom" from the *whole* to the *parts*, from systems to components, and vice-versa. The systems thinker *must* develop the *aptitude for analysis* by considering the observed objects not only as wholes but as *structures* with a composition and internal organization that produce a network of interconnected processes and value flows. However, he or she must also develop the *aptitude for synthesis* by always considering objects as elements of a vaster system. This rule indicates the *art of placing oneself at the proper distance*

to grasp both persons and the crowd, both the dynamics of the individual and that of the crowd; both the trees and the forest, the dynamics of the tress and that of the forest; both the houses and the village, the cells and the tissues, the organs and the organism, and so on.

Second rule: we must not limit our observation to that which appears constant but «search for what varies»; the variables are what interest the systems thinker. However, we must not limit ourselves to explicitly stating the variables we consider useful but must be able to measure the "variations" they undergo over time. The systems of Systems Thinking are systems of *variables*, not systems of objects.

Third rule: if we truly wish to understand reality and change, we must make an effort «to understand the cause of the variations in the variables we observe»; we must form chains of causal relationships among the connected variables. However, this is not sufficient: we also need a *Fourth rule*:

Fourth rule: it is not enough to search for the causes of the variations we observe; we must also «link together the variables in order to specify the loops among all the variations». In other words, we must move from the causal chains to the systemic *interconnections* and from the linear variations to the systemic *interactions* among the variables of interest. Independently of the type of variables observed, the systems of Systems Thinking are always formed by variables interconnected by reinforcing and balancing loops.

Fifth rule: when we observe the world, we must «always specify the boundaries of the system we wish to investigate». We cannot consider a crowd, forest or village that is endless. The systems of Systems Thinking must have a boundary.

Due to its intrinsic logic, which observes a world of variables and of variations, Systems Thinking considers *dynamic* systems of any kind in any field (Forrrester, 1991), building models of a world of incessant movement in continual transformation and evolution.

This discipline considers not only dynamic but also *repetitive* systems, which are able to repeat their processes over time, as well as *recursive* systems, capable of interacting with themselves in the sense that their output, entirely or in part, becomes their own inputs (Mella, 2012). These systems represent the typical essence of biological life and collective behaviour, which are repetitive and recursive in their typical process of birth, reproduction and death, which is destined to repeat itself again and again. The existence of a man is a chain of repetitive processes. Wakefulness is followed by sleep to allow us to face a new period of wakefulness, which requires sleep again; work is followed by rest, the office by a vacation, a discovery by new research.

The systems observed by Systems Thinking normally have a memory in the sense they can no longer be observed simply through the *input* and *output* variables; the variables of *state*, accumulating memory, must also be considered at the same time. This means that the inputs do not directly produce the outputs but instead modify one or more internal state variables which, in turn, produce the outputs. In technical terms, memory implies that different outputs may correspond to the same inputs, which refer to different moments.

In many situations, no matter how much time and energy we dedicate to them, the construction of effective systems models is not possible or is impeded by certain conditions that make it nearly "impossible to see" reality in all its connections and dynamics.

The aim of this research is to present six of these conditions that make it "difficult, if not impossible, to perceive dynamics", and thus impede our Systems Thinking and ability to understand and control the world:

1. *Temporal slowness*, or metaphor of the *boiled frog*. This obstacle derives from temporal slowness. A frog is immersed in a pot of cold water, under which a flame is lit that slowly heats the water. The temperature rises, but the frog – who knows nothing of pots, flames and researchers observing him – tries to resist the heat, perhaps in the hope the water will return to its ideal temperature. However, slowly, but inexorably, the heat becomes unbearable and the frog attempts to jump out of the water. Because his limbs are numb from the heat, the frog remains in the water and is boiled: he becomes a boiled frog.

2. *Speed of processes*, or metaphor of the *networking effect*. This obstacle is linked to the speed of processes and phenomena (usually involving accumulation and propagation based on exponential laws) that are so rapid we are not able to "recognize" their evolution until they have already produced their effects on the system. A typical case is the so-called *networking effect*, which operates particularly in *networks* of elements that propagate some information, or effect, at too high a speed to be observed, as in the case of phenomena spreading by word of mouth or pandemics.

3. *Spatial distance*, or metaphor of the *butterfly effect* (also known as the *Turing effect*), the obstacle from *distance in space*. The term *butterfly effect* derives from the physicist Edward Lorenz who, in 1979, stated that if the theories of complex systems and chaos were correct, then the fluttering wings of a butterfly in Brazil would be enough to alter climate patterns, even permanently, and generate typhoons in the Caribbean.

4. *Temporal distance*, or metaphor of *Temporal Myopia*, the obstacle from *distance in time*. Preference for short-term, individual or local advantages hide the collective and global disadvantages that will occur over the long term; for this reason, short-term, individual and local advantages are preferred to long-term and global disadvantages. In many circumstances, repetitive behavior produces *short-term*, *individual* or *local* advantages which encourage the continuation of the behavior even when it creates collective and global disadvantages that will occur over the long term. The current advantages reduce the perception of the long-term disadvantages – which are thus produced with a considerable delay – and this encourages even more of the same short-sighted behavior in order to gain present advantages. This, however, inexorably creates long-term problems when the disadvantages caused by the repeated behavior appear, so that the long-term disadvantages do not condition behavior but represent only its effect.

5. *Observational arrow*, or metaphor of the *mono-directional view*, the obstacle from observational direction. Often people "*look*" in one direction only and do not "*perceive"* the variables taking place at their backs or in other directions, at times even choosing to ignore these. The observer adopting a mono-directional view is inside a limited system and ignores, or wants to ignore, the fact that this system is part of a larger system. Observing the small system in only one direction makes it easy to ignore the larger system that is stretching out in the other directions.

6. *Complexity of structure*, the difficulty linked to structural, computational and temporal complexity of *systems with memory*. This form of complexity has been well described by Heinz von Foerster (1991), the father of "second-order cybernetics", who views a system (machine)

with *memory* – defined as non-trivial – as a *complex system* deriving from the interconnection of systems (machines) without memory, or trivial machines, which in Systems Thinking represent the elementary processes between two variables based on a cause-effect relation. In many cases, it is impossible to understand the extreme behavioral complexity of a system with memory because of the incredible number of behaviors [input-states-output] that a system with *memory* can produce.

These six difficulties are quite insurmountable. The only remedy is to become aware of their existence and sharpen even more our attention and sensitivity to them. The aim of this study is to examine in depth these six difficulties, identifying the consequences of their action in organizations and in society. It will also indicate for each of these difficulties the strategies that Systems Thinking proposes to neutralize them. In particular, we want to tackle a stimulating challenge: setting up "sensors" that signal in advance the start of the action of the six obstacles that make it difficult to observe and understand the dynamics of systems, so that the systems thinker will not be unprepared when he has to suffer their effects.

Keywords: *Systems Thinking, boiled frog, networking effect, butterfly effect, temporal myopia, mono-directional view, complexity of structure*

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Ab.40

"Travelling" in space and time: using System Dynamics models to explore intra- and inter-organization value creation dynamics

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ABSTRACT

We have now been long accepted the fact that our organizations are complex systems (Yolles, 2006), in which a number of actors pursue goals that can be both individual as well as collective, and could be either aligned or in competition. At the same time, a wide literature demonstrates how organizations are part of a broader context (Aldrich and Herker, 1977), and are therefore called to interact with various other actors (other companies, numerous stakeholders, and even the natural environment) within a network of inter-dependencies to pursue the ultimate goal of sustainable value creation (Eccles and Krzus, 2011).

This situation generates a number of issues and raises several challenges, which are to be identified, analyzed and managed when taking a decision, for several reasons: first of all, because the decision taken by one organization will inevitably affect other organizations/actors, and will subsequently trigger a reaction from them. That is to say, we cannot take decisions adopting an event-oriented approach or blaming other agents(the so-called "the enemy is out there" syndrome - Senge, 1990); rather, we need to look beyond the borders of our own organization and adopt a feedback loop-oriented perspective. Second, time delays will inevitably play a relevant role in this process, affecting - for instance - the way in which we receive, process and transmit data and information, or the way in which we will make decisions, carry out actions, and complete tasks.

Overall, these factors can be summarized by the concept of "dynamic complexity" (Sterman, 2002), which is widely adopted in the social sciences and managerial researches, although still vastly understudied (e.g., Hoffmann, 2017).

In this regard, previous literature refers to a number of methods, techniques, and tools that may be used to assist decision-makers in analyzing dynamic complexity, and subsequently taking decisions in complex intra- and inter- organizational contexts. Specifically, this study advocates the use of System Dynamics (Forrester, 1961 and 1968, Richardson and Pugh, 1981, Sterman, 2000) modelling principles and tools.

Originally theorized by Jay Forrester (1961), System Dynamics is a methodology aimed at building qualitative and quantitative models useful to tackle a variety of complex and dynamics issues in a variety of systems, such as environmental (e.g., Meadows et al., 1972; Ford, 1999;

Moxnes, 2004; Barnabè, 2016) and business-related systems (Roberts, 1978, Morecroft and Sterman, 2000; Sterman, 2000; Pidd, 2004; Qudrat-Ullah et al., 2007; Morecroft, 2007).
Briefly, we remind that three key concepts are at the core of System Dynamics: stocks, flows, and feedback loops. These concepts are discussed in this study since they play a relevant role in representing, analyzing and managing dynamic complexity. More in detail, System Dynamics simulation models and simulators have a long tradition as tools able to assist managers and decision-makers in exploring intra- and inter-organization dynamics and in understanding the consequences of the actions being carried out. As said, this may refer both to the organization under analysis, and to its relationships with other organizations, various external stakeholders and the broad external environment. In this way, System Dynamics can assist decision-makers in understanding where the "borders" of their own organization are, and how to make decisions and take action within (or beyond) those boundaries.
Relying on these considerations, this study presents the key features of a business-related System Dynamics-based Interactive Learning Environment (Spector and Davidsen, 1997, Davidsen, 2000; Spector, 2000; Kopainsky and Sawicka, 2011; Davidsen and Spector, 2015).
The Interactive Learning Environment was used to support scenario analysis (Schoemaker, 1993 and 1995) and knowledge sharing (Nonaka and Takeuchi, 1995) within a focus group of players with an educational background in management. Notably, the author acted as a "facilitator" (Vennix 1996), in order to assist players in running the simulation and, subsequently, in order to favor discussion and sense-making.
Overall, this study aims at contributing to the existing literature on the concept of dynamic complexity since it focuses on two key concepts which play a fundamental role in affecting decision making and value creation: "space" and "time".
Considering the former ("space"), it is noteworthy to recall that the System Dynamics representation of an organization as a system "consists of the feedback loops, stocks and flows, and nonlinearities created by the interaction of the physical and institutional structure of the system with the decision-making processes of the agents acting within it" (Sterman, 2000, p. 107). Moreover, when exploring how a specific organization interacts with its broader environment, System Dynamics allows representing and analyzing the complex hierarchy of feedback loops that interlinks the organization itself and other agents/organizations, thus affecting their states, behavior, and decisions.
As to the latter ("time"), System Dynamics principles and tools explicitly allow considering, modelling, simulating and analyzing time delays, subsequently also supporting decision-makers in exploring (and understanding) how their actions affect and determine the behavior (i.e., the dynamics) of the system under analysis in the short, medium and long-term.
For all the reasons aforementioned, it is author's opinion that this study can be of interest both for academics and practitioners.

Keywords*:* *System Dynamics, Interactive Learning Environments, dynamic complexity, time and space, value creation.*

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Ab.41

MEDEAS-World model calibration for the study of the energy transition

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ABSTRACT

MEDEAS (Modelling the Energy Development under Environmental And Socioeconomic constraints") world model is a global, one region-aggregated economy-energy-environment model which has been developed applying System Dynamics to integrate the knowledge from different perspectives as the feedbacks from different subsystems.
MEDEAS world consists of a modular and flexible structure, where each module can be expanded/simplified/replaced by another version or sub-model. MEDEAS model runs from 1995 to 2050 in order to predict the energy transition Fossil Fuels/RES (Renewable Energy Sources) and it is structured into 7 submodules (Capellán-Pérez et al., 2017[a,b]; Solé et al., 2018):
1) **Economy**: It is modelled following a post-Keynesian approach assuming disequilibrium (i.e. non-clearing markets), demand-led growth and supply constraints, integrating the Input–Output Analysis of 35 industrial sectors and households.
2) **Energy**: This module includes the renewable and non-renewable energy resources potentials and availability considering biophysical and temporal constraints. In total, 5 final fuels are considered (electricity, heat, solids, gases and liquids) and a diversity of energy technologies are modelled, following a net energy approach.

3) **Infrastructures**: Energy infrastructures represent the power plants to generate electricity and heat.
4) **Materials**: Materials are required by the economy and MEDEAS tracks the material requirements for the construction and the Operations and Maintenance of the infrastructures.
5) **Land Use**: it mainly accounts for the land requirements of the RES.
6) **Climate Change**: This module projects the climate change levels due to the GHG (Green House Gases) emissions generated by the human societies, which also feed-back through a damage function.
7) **Social and Environmental Impacts Indicators**: this module translates the "biophysical" results of the simulations into metrics related with social and environmental impacts. The objective is to contextualize the implications for human societies in terms of well-being.
The modules of economy and energy are the most extensive and reach the highest degree of disaggregation. The modules have bi-directional linkages, excepting for the Land-use and Social and Environmental impacts indicators which mainly report outputs from the simulations without feed-backing to rest of the structure (see Figure 1).

In this work we apply an optimization algorithm to fit with MEDEAS model the GHG emission scenarios provided by IPCC (International Panel on Climate Change) and integrated by INSTM according to Global Warming 2 °C consistent. The aim is to explore the capability of the model in reproduce experimental data (scenarios).
Model optimization or identification is a common mathematical technique to calculate the parameters of a dynamical system in order to fit experimental data, that represent a physical phenomenon, with its model representation. In literature we find several examples, in mechanics, engineering, economics and finance, geophysics, biology, ecology and so on (see for example Dorfman, 1969; Marsili-Libelli, 1992; Martelloni et al., 2013; Santarlasci et al., 2014).

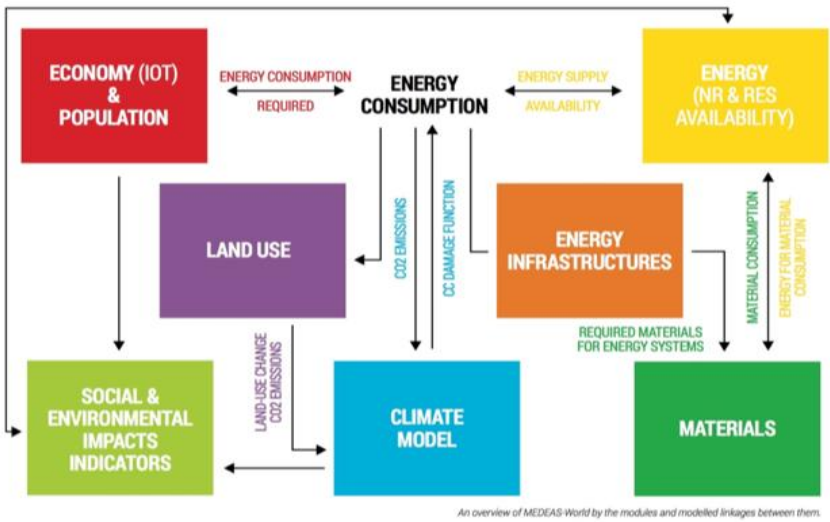

***Figure 1**. Overview of MEDEAS-World by modules and the linkages between them.*

The Optimization methodology is implemented in MATLAB® which allows running the Python platform in which MEDEAS is developed.

In this context, we do not report all the details of the optimization procedure that is schematically described in the block diagram of Figure 2.

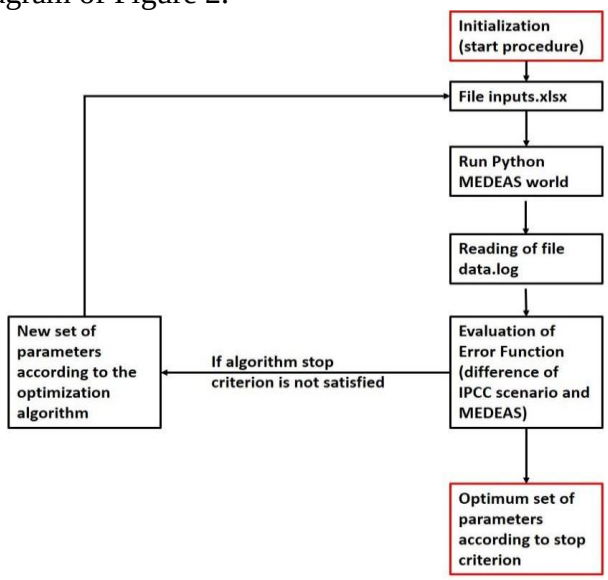

Figure 2*. Block diagram exploiting the optimization procedure.*

Here we report the preliminary results of two optimizations obtained using SIMPSA algorithm (Cardoso, 1996) to fit IPCC emission scenario at world level with starting policy from year 2020 in order to reduce GHG emissions (increment of RES and reduction of fossil fuels). This optimization algorithm finds the best set of parameters **P** = [k_1, …, k_i, …, k_n] which minimize error function F(**P**),

$$F(\boldsymbol{P}) = \frac{1}{N}\sum_{i=1}^{N}\left(x_i^{exp} - x_i^{mod}(\boldsymbol{P})\right)^2 F(\boldsymbol{P}) = \frac{1}{N}\sum_{i=1}^{N}\left(x_i^{exp} - x_i^{mod}(\boldsymbol{P})\right)^2, \quad (1)$$

where x^{exp} and x^{mod} indicate respectively the "experimental" (IPCC/INSTM scenario) and the values obtained by the MEDEAS model on time (i represents the number of data relative to time in years). The optimization procedure stops when the value of the error function is lower than an arranged threshold (see Figure 2).
MEDEAS model is extremely complex as it contains many parameters and variables (several hundreds), so the strategy is to calibrate the parameters that directly influence the emissions as annual growth of RES parameters, the rates of coal and oil extraction, GDP (Gross Domestic Product), annual population growth, etc. Moreover, it is central to set the search ranges in which the parameters vary, in order to obtain from calibration a set with physical sense (see Table 1).

We show the result of the first optimization in which we consider 39 parameters, three for GDP, two for the population growth and 34 other ones as indicated in Table 1. For GDP we set three ranges for the calibration procedure: [0.02 0.065] from 2015 to 2020, [0.005 0.015] from 2021 to 2025 and [-0.025 -0.001] from 2026 to 2050. By calibration we obtain respectively for the GDP intervals the values 0.0612, 0.01 and -0,0149. While for the annual population growth we use a linear function in which the slope is imposed to vary from -0.00041 to -0.00039 and the intercept from 0.8 to 0.82 (see in Figure 3 the result from calibration). Regarding the other parameters

involved in the optimization we set the ranges as indicated in Table 1. In Figure 4 we show the result of the fitting in which we can note the according between the two emission curves expressed in GT (Gigaton).

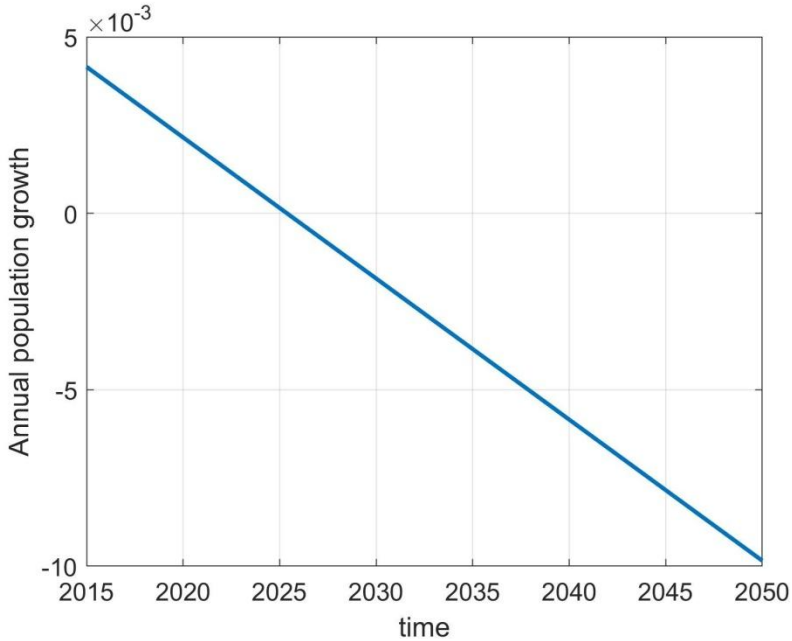

Figure 3*. annual population growth obtained by means of optimization algorithm.*

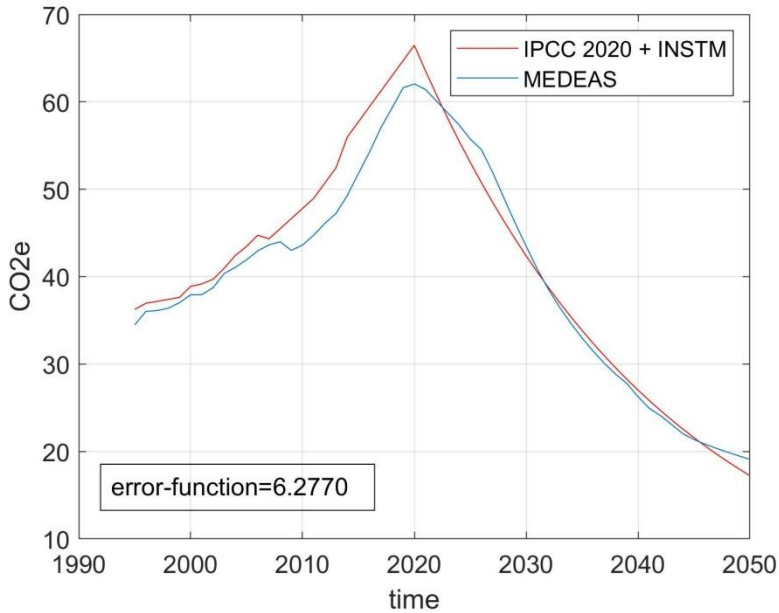

Figure 4*. Total CO2 equivalent (all GHGs) obtained by SIMPSA optimization with 39 calibrated parameters.*

Table 1*. All parameters regarding optimization shown in Figure 4, we report the optimized values in column 2 and the set ranges for the calibration in column 3.*

Parameters	***Optimized values (Figure 10)***	***Range for the optimization***
P hydro growth	*30,3%*	*0 - 50 %*
P geot-elec growth	*29,2%*	*0 - 50 %*
P solid bioE-elec growth	*17,4%*	*0 - 50 %*
P oceanic	*24%*	*0 - 50 %*
P onshore wind	*21%*	*0 - 50 %*
P wind offshore	*9%*	*0 - 50 %*
P solar PV (Photovoltaic)	*45%*	*0 - 50 %*
P biofuels 2gen	*15,0%*	*0 - 50 %*
P biofuels 3gen	*27,0%*	*0 - 50 %*
P bioE residues for heat+elec	*16,0%*	*0 - 50 %*
P cellulosic biofuels	*33%*	*0 - 50 %*
P waste change	*0,025465277*	*0 - 0,1*
P BEV (Battery Electric Vehicle) growth	*28%*	*0 - 50 %*
P HEV (Hybrid Electric Vehicle) growth	*34%*	*0 - 50 %*
P NGV (Natural Gas Vehicle) growth	*8%*	*0 - 50 %*
P PHS (Pumped Hydro Storage)	*20,0%*	*0 - 50 %*
P CSP (Concentrated Solar Power)	*41%*	*0 - 50 %*
P solar for heat	*29,6%*	*0 - 50 %*
P geothermal for heat	*32,2%*	*0 - 50 %*
P solid bioE for heat	*14,3%*	*0 - 50 %*
Policy electric household 4wheeler vehicle Tfin	*0,52420319*	*0 - 1*
Policy hybrid household 4w vehicle Tfin	*0,309401608*	*0 - 1*
Policy gas household vehicle 4w Tfin	*0,031106111*	*0 - 1*
Policy electric 2wheeler h. Tfin	*0,655017852*	*0 - 1*
Policy change to 2wheeler h. Tfin	*0,597248823*	*0 - 1*
Policy hybrid HV Tfin	*0,164336529*	*0 - 1*
Policy gas HV Tfin	*0,517193803*	*0 - 1*
Policy electric LV Tfin	*0,243356834*	*0 - 1*
Policy hybrid LV Tfin	*0,081390031*	*0 - 1*
Policy gas LV Tfin	*0,496621902*	*0 - 1*
Policy electric bus Tfin	*0,200234358*	*0 - 1*
Policy hybrid bus Tfin	*0,680892168*	*0 - 1*
Policy gas bus Tfin	*0,011117541*	*0 - 1*
Policy electric train Tfin	*0,887146369*	*0 - 1*

Then we perform other simulations considering the updated data of GDP and population growth from World Bank (https://data.worldbank.org) up to 2017 fitting the CAT (Climate Action Tracker) database emission scenarios. In particular, we are achieving MEDEAS optimizations according to warming high, median and low projection 2 °C consistent, as these projections have statistical validity.

First of all, we report a simulation taking into account only the update of historic data of the GDP (up to 2017). In this way we simply consider the optimized simulation of Figure 4 replacing the values of obtained optimized GDP with the data of Table 2 (see Figure 6).

Table 2. *historic data of GDP rate from 2015 to 2017 (World Bank) considering constant from 2017 to 2020.*

YEAR	***GDP rate***
2015	*0,0286*
2016	*0,0251*
2017	*0,0315*
2018	*0,0315*
2019	*0,0315*
2020	*0,0315*

Moreover, we report a new calibration fitting the warming projection 2 °C consistent (high), where the values of optimized GDP are 0.015 from 2018 to 2020, 0.01 from 2020 to 2025 and 0 from 2026 to 2050 (these values are the minimum of the fixed search ranges).

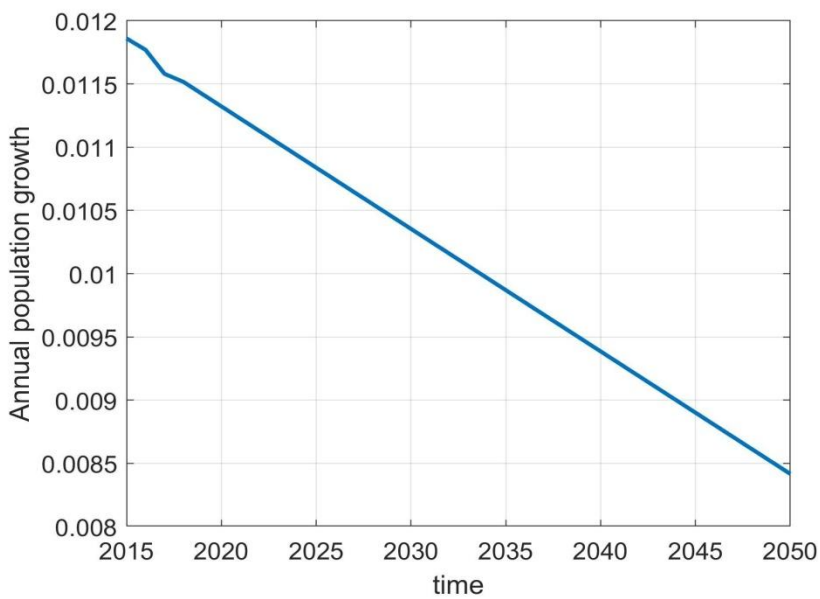

Figure 5*. Optimized annual population growth (from 2015 to 2017 we consider historic data).*

The annual population growth is optimized according to linear trend (see Figure 5) starting from fitting the data 1995-2017 from World Bank. We do not report the optimized RES parameters as the results are similar to those are already reported in Table 1. In Figure 6 we compare the MEDEAS simulations with some scenarios provided from IPCC and INSTM (Perissi et al., 2018), the current policy projection, the warming one 2 °C and 1.5 °C consistent. From comparison we can demonstrate that the MEDEAS model is suitable to reproduce theoretical scenarios in a large parameter domain, but it is necessary to investigate the feasibility regarding the values of the involved parameters as, first of all, GDP and RES growth.

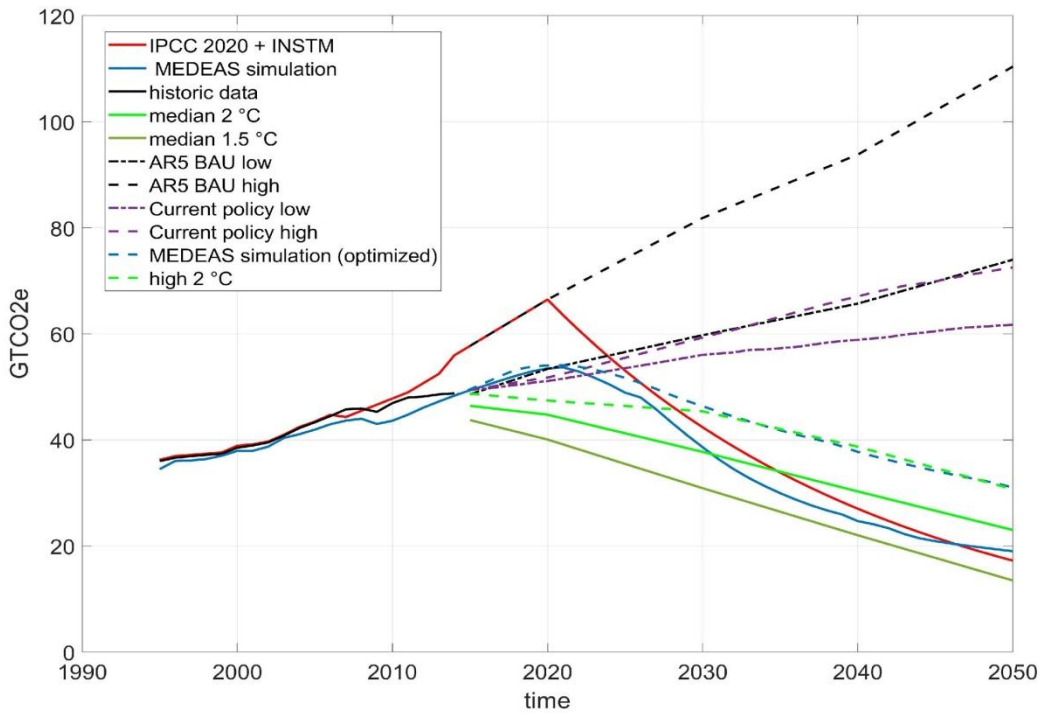

Figure 6. The red line is the IPCC2020 + INSTM scenario, the blue line is the MEDEAS simulation of Figure 4, but considering GDP of Table 2 ; the dark dash and dark dash-dot are respectively the AR5 BAU high and low ; the violet dash and dark dash-dot are respectively the current policy high and low; the green and green dash are respectively the median and high warming projection 2 °C consistent ; the blue dash is the optimized MEDEAS simulation according to projection 2 °C consistent (high) ; the dark green is warming projection 1.5 °C consistent, reported for comparison with MEDEAS simulations.

The work is nowadays in progress, other combination or different search ranges of parameter variability can be implemented and explored with the presented procedure. Moreover, we are running a calibration of median warming projection 2 °C consistent and we intend to study the fluctuation of some parameters (starting for historic data), for example the GDP from which the model presents a certain sensibility. Moreover, it is important to study the parameters from statistically point of view.

Keywords: *system dynamics, energy transition, mathematical model, parameter calibration, fitting.*

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Ab.42

Smart Material Planning Optimization Problem Analysis— Applying the System Dynamic Approach

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ABSTRACT

The smart manufacturing is not just about a production trend toward the coming era of *Industry 4.0*, but also more on the improving the decision quality based on the business analytics. One of the reasons that makes the production activities less efficiently is the inaccuracy of the demand forecasting. It seems this is an operation research problem, but it is far more sophisticated than it appears.

As **Figure 1** illustrated in the Business Process Modeling Annotation (BPMN), the factory must maintain—through production activities— a certain level of good-instock to fulfill the sales orders; if the quantity of the good-in-stock is adequate, the factory shall deliver on-hand good directly, otherwise, trigger the production.

When production is triggered, the factory planner will look into the generated material-requisition plan based on the bill-of-material of good. A number of procurement sub-processes will be undergoing to recover the shortage of materials. The suppliers must deliver their material in time before the production begins.

The factory challenges are: (1) the customer requests the goods delivery lea time is far short than the total time of good built and shipped; (2) the shipping conditions, such as extreme weather impact or the traffic jam, determine the logistic time; (3) the material preparation time varies drastically from vendor to vendor; (4) each good consists of hundreds of materials; there are many common materials across the goods; (5) many sales orders asking for the customized goods rather than the standard configuration ones; this implies the traditional approach—to do the material planning based on the forecast on the goods-of-sold— is not feasible; and (6) the planner frequently made poor procurement decisions by guessing the demand that caused the annoying over-provisioned problem.

From the order fulfillment perspective in terms of the total time required for delivery, the PG3 is the deadline that the sales order committed the delivery to the customer; the PG2 is the time

required for the logistics; while the PG1 is the shipping preparation time to pull goods from the inventory. Thus:

$$PG3 \geq Today + PG2 + PG1.$$

As mentioned before, when good in stock cannot fulfill the sales order, the further production process must be initiated as earliest as possible and completed within $\Delta P = PG3 - (PG2 + PG1)$. If the materials are sufficient to build the goods, then as long as the $\Delta P \geq Time_{built}$, the order fulfillment is secure. Otherwise, unfortunately, this is the common situation, the material procurement processes must be commenced; but each material arriving to the factor time is not the same, that means the earliest production time actually coincides with the latest arrival time, thus $\Delta P \geq max(Time_i) + Time_{built}$ must be satisfied. In many occasions, always $\Delta P \leq 0$ if the factor applying the Just-in-Time (JIT) model, simply the material preparation time is $PM3 \gg \Delta P$. Similarly, the supplier also faces the same dilemma, the $PM3 = max(PM1_j) + PM2$. Consequently, the factor must "guess" the coming demand and procure the material in advance to minimize the $max(Time_i)$. When the "guess" forecast is far more optimistic or pessimistic than the real demand, either the idle material sitting in the warehouse too long or the factory capacity cannot maximize the profit from the booming market.

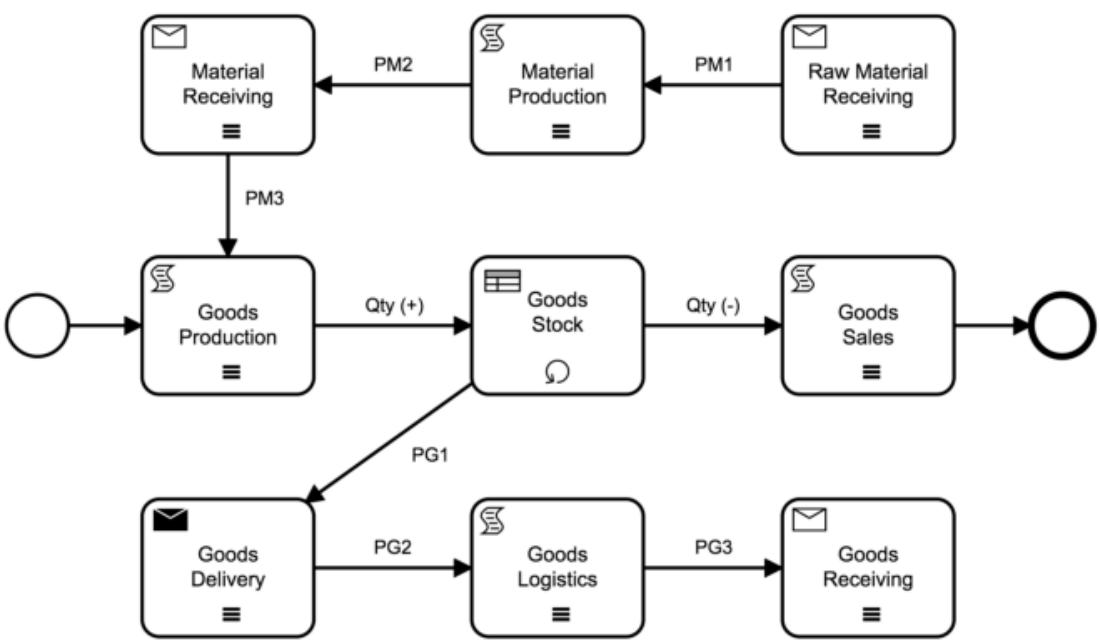

Figure 1. The Business Scenario

Apparently; from the previous analysis, the aforementioned challenges are not isolated to one another; each unpleasant symptom may activate the chain-reaction of other challenges in latter

events. Owing to this problem with dynamic complexity and reinforced feed-back loops in nature, this paper, applying the system dynamics analytical approach, pointed out the root causes that attributes to the inaccurate material forecasting, and proposes a new iterative framework, combining with the microeconomic perspectives, to close up this inaccurate gap between the forecast and the real demand.

Keywords: *Material Planning, Business Analytics, System Dynamics, Firm Optimization*

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Ab.43

Supporting the development of an Enterprise Architecture with System Dynamics: the Once Only Principle Business Case.

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ABSTRACT

Nowadays, in an increasingly complex and connected world, with the term enterprise we indicate a collection of organizations that have a common set of goals [1], where each organization is a socio-technical system that relies both on people and ICT systems to satisfy their these goals. An extended enterprise nowadays frequently includes partners, suppliers, and customers. We cannot assume that these organizations share a common ownership, management, strategies, infrastructure and policies or that an overarching control infrastructure exists. What really matters is interoperability, i.e. that these systems can cooperate with each other at different levels, coordinating their efforts to attain the common objectives.

In this context, Enterprise Architecture (EA) is the bridge between the abstract business goals and the final (concrete) systems that contribute to satisfy those business goals [2]. Typically, EA is developed because stakeholders have concerns that need to be addressed by the organization as a socio-technical whole.

ISO/IEC/IEEE 42010:2011 defines "architecture" as "The fundamental concepts or properties of a system in its environment embodied in its elements, relationships, and in the principles of its design and evolution."

While until some years ago EA was intended as a description of the IT systems, comprising views of the software applications and of the hosting infrastructure, lately the concept of EA has evolved towards a systemic approach, where the motivational, legal, organizational aspects have gained the same importance of the Data, Application and Technology architecture.

Various frameworks exist to assist the architects in the development of an EA: they provide help in structuring the architecture description into domains, layers, or views, offering models for documenting each view. Well-known examples are the IBM's Business Systems Planning (BSP, 1980), the Zachman Framework (1986), PRISM architecture framework, The National Institute of Standards and Technology (NIST) Enterprise Architecture Model, the U.S. Federal Enterprise Architecture Framework (FEAF) and the Open Group Architectural Framework, TOGAF (2003 onward).

We will refer mainly to the TOGAF 9.2 Architecture Development Method (ADM) as it provides a tested and repeatable process for developing architectures and it can be augmented with other methods, in order to suit specific needs or to gain a deeper knowledge about some aspects.

In addition, as the Architectural description Language (ADL) we will use ArchiMate 3.0.1 [4], which is a visual language for describing, analyzing, and communicating the concerns of Enterprise Architectures as they change over time through a set of entities and relationships with their corresponding iconography for the representation of Architecture Descriptions.
The generic metamodel of ArchiMate is comprised of two main types of core elements: structure ('nouns') and behavior elements ('verbs').
Until the last release, the ArchiMate language was focused on describing the architecture of systems that support the enterprise and it did not cover the elements driving the design and operation of the enterprise. Lately, several motivation elements have been included in the language: stakeholder, value, meaning, driver, assessment, goal, outcome, principle, and requirement.
The Metamodel of the Motivation Layer contained in the ArchiMate 3.0.1 specification has introduced elements to model the motivational elements and of the factors that influence the architecture. They can originate from either inside or outside the enterprise. Internal drivers, also called concerns, are associated with stakeholders, which can be some individual human being or some group of human beings, such as a project team, enterprise, or society. In addition it suggests to undertake an assessment of these drivers; e.g., using a SWOT analysis, in order to respond in the best way.
Given this premise, probably the time has come to integrate the use of systems thinking and System Dynamics in the ADM.
The adoption of a systemic approach can support a deeper understanding of the explanation of architecture rationale and the justification of the architectural decisions, giving a good framework to go deeper into the relationships among strategies, policies, initiatives, and stakeholders. In addition, SD and system thinking can be particularly useful in addressing complex or wicked problem situations since they explore inter-relationships (context and connections), perspectives (each stakeholder has their own unique perception of the situation) and boundaries (agreeing on scope, scale and what might constitute an improvement).
To prove the feasibility of the integration between SD and ADM, we exploited the ArchiMate 3.0.1 Motivation Elements, which model the motivations, or reasons, that guide the design or change of an Enterprise Architecture, to represent the usual Causal Loop Diagrams [5] of system dynamics. These give a qualitative description of the Business Dynamics. Their qualitative nature is not out of place in the abstract motivation layer.
In order to attain a quantitative analysis (Stock and Flow Diagrams) of how much the divers influence the behavior of the system represented by the Architecture Description, we must link the motivation elements to some specific core element and in turn to its realization.
ArchiMate specification contains the pattern to model how a requirement (and, indirectly, also a principle, outcome, and goal) can be related directly to a structure or behavior element by means of a realization relationship. In addition, ArchiMate allows the weaker influence relationship between these elements. What the ArchiMate expressive power does not include by default is the capability to express quantitative behavior of the system, which instead the SD models can model very well.
The possibility to augment the ADM with SD following the approach described above was tested over the Once Only Principle (OOP) business case [6]. The once-only principle is an e-government concept that aims to ensure that citizens, institutions, and companies only have to provide certain standard information to the authorities and administrations once. By incorporating data protection regulations and the explicit consent of the users, the public administration is

allowed to re-use and exchange the data with each other. The once-only principle is part of the European Union's (EU) plans for the improvement of the Digital Single Market through the reduction of the administrative burden on citizens and businesses.

The integration between SD and ADM allowed to model the drivers and the barriers to the implementation of this principle in cross-border interactions between e-Government services across EU and to derive an estimate of the savings that it would generate.

Left to some further development and exploitation is the linking of the SD cycle to the <<Assessment>> abstract element in the ArchiMate Language.

Keywords: System Dynamics, Business Dynamics, Enterprise Architecture, e-Government, Digital Single Market, Once Only Principle.

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Ab.44

Why the Bottom-Up Approach Fails with the Challenges Facing Humankind. A System Dynamics Model Study of the Diffusion of Memes in the World Wide Web

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ABSTRACT
Humankind faces today a number of fundamental challenges related to its interaction with the planetary ecosystem: climate change, mineral depletion, species extinction, overexploitation of resources and more. As the situation worsens, these challenges appear more and more visible and it is a common opinion that – at some point – a majority of people should recognize the danger and clamour for action against the threat. However, this "bottom-up" approach is failing. For instance, the correlation of climate change with some recent phenomena in the form of large fires and hurricane went unmentioned in the traditional media and generated no new interest in climate change. So, why don't people react to events that are potentially existential threats for them? The aim of this study is to develop a system dynamics model that can tell us the reasons for this failure. We base our model on the concept of "meme", a self-replicating unit of information existing in the virtual space, that can be thought as an analogy to the "gene" existing in the biosphere. The virtual space, formed by printed media, broadcast media and the World Wide Web allows the propagation of this unit of information by means a "viral" mechanism, similar to the self-reinforcing mechanism we observe in individuals which infect each others when exposed to a viral flu. In a previous paper, we showed how this mechanism can be simulated with a simple system dynamics model, almost the same used to describe the diffusion of epidemic diseases in medicine. In that article, we assess that initial mechanism that caused memes spreading can go viral, by a bottom-up mechanism generated by interactions among individuals, whereas others were pushed by a top-down effect generated by traditional media. Continuing on the basis of this

first study, in the present paper, we analyze the decline of the diffusion of memes as revealed by statistical analysis of the number of Web searches. We find that we can describe this behavior by means of a three stock model where the diffusion occurs in sequence from 1) unaware, 2) active, and 3) quiescent. This sequence for memes is wholly analogous to that known in epidemic studies as 1) sane, 2) infected, and 3) immune. When we compare the model result to the historical data, we find that it can describe the real behavior of memes. The model tells us a very important factor not commonly recognized. The diffusion of a new meme, such as climate change, follows a cycle that leads people to a condition of quiescence where they are immune to acquiring new information. In other words, many people are aware of the danger and the importance of – say – climate change, but they do not react to new information and they do not act on the challenge. The cycle that leads to this situation is self-contained into virtual space and new information (e. g. hurricanes and other climatic disasters) affect it at most as temporary spikes of interest which quickly fade out. The consequence is that it is hopeless to think that some large event or disaster will move the public opinion toward action against climate change. The bottom-up model simply doesn't work and we need to find new approaches to generate action against climate change and other threats for humankind.

Keywords: meme, System Dynamics, Ngram viewer, Google trends.

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Ab.45

Impact assessment of dematerialization inside organizations through System Dynamics modelling

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ABSTRACT

Every organization needs to manage documents to carry out and support its operational processes, regardless of what the organizational scope is or what is the contest in which it operates. The totality of documents present inside the organization represent informative capital of fundamental value. In fact, most of the valuable information in organizations is in the form of documents such as business forms, reports, letters, memos, policy statements, contracts, agreements, etc. (Sprague Jr, 1995). Their gathering, storage, management and research represent for the company a considerable cost that becomes even more significant if those documents are in their paper form.

Although different definitions exist, in all cases dematerialization refers to the reduction of the throughput of materials in human societies (Van der Voet et al., 2004). In this specific study, the concept of "dematerialization" indicates the progressive increase in digital and computerized management of documents and processes within public and private bodies, with consequent takeover of dedicated solutions at the expense of traditional supports.

Just last year, data surfaced that, globally, we used more than 400 million metric tons of paper. The United Nations predicted that paper usage is expected to rise by 50%. The average employee is now using more than 10,000 sheets of paper a year, which have a cost of about 80-100 dollars, including also the cost for toner, energy, employee time spent printing, filing and searching for documents, this use can really have important negative effects for both the environment and company's costs. In fact, the average enterprise wastes $2.5m-$3.5m per year just searching for information and re-creating lost documents.

Moving from the logic of dematerialization of documents to the logic of process digitization, the achievable benefits are much more extensive: the savings on paper and materials also include the savings on process costs thanks to a reduction of inaccuracies, interactions, labor and storage costs.

The purpose of this research is to highlight, through simulation and System Dynamics, the advantages that an organization can pursue through the digitalization of its processes, especially in terms of economic savings.
Systems Thinking and its operational form, System Dynamics, is a way of looking at systems from a holistic point of view. Its purpose is to determine what is the system's structure and in what way the structure affects its behavior over time (Sterman, 2000).
The use of System Dynamics allows a different approach to the analysis, over time, of the behavior of complex systems and their formalization, since it is able to manage intrinsic characteristics of real-world systems, such as: non-linearity, presence of delays, self-organization, dependencies on past behavior, feedback processes and resistance to change (O'Connor and McDermott, 1997).
Thanks to these features, the SD approach will allow the definition and analysis of a document management process that proves to be versatile and representative of operating methods, also related to non-homogeneous organizational structures. For this purpose, the methodology of Stock & Flow modelling (one of the tools of System Dynamics) will be used.

The process of the document management can take place through different and extremely varied operating procedures; in order to create a simulation model as much flexible as possible, four distinct sub-processes have been defined (Figure 1). They encompass the classic activities characteristic of document management: Ingestion, Processing, Outbound, Archiving.

The starting point of the process is the "ingestion" phase of the documents in the system, it is the phase in which the external documents arrive inside the organization. There are different types of input data:

- Paper documents;
- e-mails;
- PDFs;

- Registered documents.

The "processing" phase contains the following sub-processes:

- Elaboration;
- Working;
- Approval;
- Reworking.

Elaboration is the first stage that incoming documents face by entering the workflow and includes activities such as: document reception, filing, assignment, classification and sorting. The document flow is managed through dedicated resources and then the document proceeds to the next processing phase.
The working phase is the central node of the workflow in which the document is processed and in which its treatment is handled entirely; the workload in this level is also supplemented by internal documents for which rework is required after having detected any errors at the approval stage or subsequently during the consultation.
In the subsequent approval phase the worked document is validated or rejected; non-approval can occur for the failure to comply with process standards, for which it is necessary to rework the document in question through its return to the processing phase, or due to its refusal for non-suitability of the request that is the object of the document, with the pre-established requirements.

The documents processed and approved proceed with the "outbound" phase in which they are gathered in catalogs; the catalogs consist of a physical space, inside or outside the company, dedicated to the collection of the documents produced by the organization and it represents an intermediate stage between the processing of the documents and their subsequent permanent conservation.

At the end of a specific time interval, depending on the type of document under examination, we move from filing to "archiving". It is a deeper level of storage in which documents are kept until the end of their useful life.

Considering these four processes, two different Stock & Flow models were developed. One of the two describes the situation in which the organization works using only documents in paper-form, from the ingestion to the archiving process; conversely, the other describes an organization which creates and manages only documents in digital format. The differences of the two models are due to the unavoidable redesign of processes that a digital solution cause compared to a traditional paper-form solution.
As model's outputs, the model of "paper-form" organization considered the following cost variables:

- Total cost of printing in ingestion: related to the printing activity of digital documents that come from outside of system;

- Total cost of processing: related to the costs of the main processing phase of the document, like registration activities, affixing the firm date and reprinting of all the documents after the processing;
- Total cost of storage: relating to the standard storage phase including the cost of immobilizing the storage resources;
- Total cost of printing for routing: related to the costs of printing documents that need to be transmitted outside the organization and for this require the printing of an additional copy;
- Total cost of shipments: relative to the total costs related to the shipment of documents to the outside, this variable is generated by the sum of the total costs connected to each shipping carrier available: fax, registered mail, courier, postal mail.
- Total document retrieval cost: cost related to the research activity and retrieval of documents lost during the various stages of the process;
- Total document reproduction cost: cost related to the reproduction of documents lost during the various phases of the project and not found.

With regard the model of "digital-form" organization, the following cost were considered:

- Total cost of printing for routing: according to a more cautious approach, it has been assumed that, despite the introduction of Certified Mail, a residual percentage of documents is still transmitted in a traditional way by paper;
- Total shipping cost: represents the costs related to sending a residual percentage of documents in the traditional way;
- Platform purchase cost: this is the initial purchase cost of the digital platform, this is a one-off cost associated with the acquisition of hardware and software tools needed for computerization of the process, it depends on the number of licenses acquired and the type of offer proposed by the service company;
- Maintenance cost: it is the annual cost of assistance and support to maintain the software up-to-date and functioning.

The results of simulation showed that the reduction in total costs of documents management process is almost 60%, a particularly impressive value if we consider that this data takes into account only the direct costs related to the activities envisaged in the four processes and does not evaluate the savings achievable in terms of recovery of working time of human resources in the organization.

This is still the main limitation of this work. The lack of clear information on the productivity of resources, and the exclusion of this dimension from the study, did not allow to fully define and analyze the business scenario.

In fact, the increase in efficiency, the reduction in the operating times and the recovery of staff productivity implicate a surplus of capacities, that allow the reduction of total costs and the

generation of new available resources, in order of hundreds of man-days, that can be redirected to activities with greater added value.

Finally, a phase of overlapping of the two models (paper and digital), connected to the coexistence of the two procedures, should be also considered for a specific period. The study carried out was focused on the comparison of the results obtained from the two fully operational models. The analysis, through simulation, of the transition phase would be an element of considerable added value as it allows to verify implementation periods, possible critical issues, response from employees involved in the digitization and that of the users with whom the organization is related.

Keywords: Dematerialization, Digitalization, Information Management, Document Flow Management.

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Ab.46

Ethical commitment and firms' risk: exploring the risk-return trade off from S&P 500 index

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ABSTRACT

The external social pressure and the increasing power of the media and the activist groups in modern societies lead organization to see non-market strategies as founding stone of their behaviour. In order to make these strategies effective businesses have to focus their attention on the different ways they affect the society: their corporate social performance (CSP). CSP can be defined as the way in which a given organization arrange its principles of social responsibility, processes of social responsiveness, and all the various policies, programs, and observable outcomes as they relate to their local area (Wood, 1991). Hence, it is clear that modern companies are part of a complex system linking all the actors with several, different ties, binding them with a social contract asking each of them to respond to the expectations of the others in order to get the legitimacy they need.

Corporations can adopt voluntary social responsibility disclosure practices to help them to increase their legitimacy towards all stakeholders, influencing their behavior and creating a positive corporate association (Brown and Dacin, 1997) as a consequence there is a growing concern on the various ways companies can tell to their stakeholders how they respond to the environmental and social issues of the modern society and, especially in the last 20 years (Deegan 2002; Kolk, 2003), they have increased their efforts in the development of social disclosures practices.

Recently, Hanss and Böhm (2012) have found that the corporations' need to become more legitimized actors have driven them to back the stakeholders' requests towards environmental sustainability and other issues related to social sustainability.

The debate on the economic and financial effects of these business practices is still open and vibrant,as the studies on the relationship between the Corporate Social Performance and the Corporate Financial have only got mixed results (Ullman, 1985; Margolis and Walsh, 2003). Some studies have even found that a more Socially responsible behavior is usually paired with a worse performance (Wright and Ferris, 1997), while other studies have found that they can help in creating a better reputation and, consequently, they can help increasing the financial performance in the long run (Orlitzky, Schmidt and Rynes, 2003). According to other scholars, there is no real relationships between the two phenomena as they have found no significant effect (McWilliams and Siegel, 2000). Finally, some other have found a U-shaped relationship indicating that the first attempt at being socially responsible are not usually able to increase the value of the company but when they behaviour becomes more significant it starts to influence the behavior of the stakeholders leading to a better financial performance (Barnett and Salomon, 2012).

Although theory and research focused primarily on the relationship between corporate social responsibility and corporate financial performance, an argument for a relationship between social responsibility or corporate sustainability and such measures of financial investor risk can also be made (Spicer, 1978; Ullmann, 1985). Indeed, low levels of social responsibility may increase a firm's financial risk. Investors may consider less socially responsible firms to be riskier investments because they react to them as if the management was not able to define the right set of relationships with the local area (Alexander & Bucholtz, 1978; Spicer, 1978). Indeed, ethical issues and social responsibility in finance can play a driver role in investors stock-picking, considering the other non financial aspects such as the long-run impacts can have on the environment and society (McLachlan & Gardner, 2004; Hockerts & Moir, 2004).

On this ground, the aim of this research study consists in exploring how much the company risk profile can be affected by the ESG commitment and Corporate Social Disclosure. In doing so, we investigate how investors can mitigate their risk exposure through an ESG screening in their decision making processes. Furtherly, we observe the dynamics of risk-return trade-off regarding our ethical companies sampling.

In order to test our hypotheses, we have collected data from three global providers engaged in the disclosure of financial and non-financial information: Sustainalytics, a rating agency having been adopted the ESG framework (environmental, social, governance) since 1992; Morningstar, an investment research and investment management firm; the Global Reporting Initiative.

We have chosen to adopt the data from Sustainalytics as they can be used to understand how each company proactively manage the environmental, social and governance issues they have to confront with, to mitigate the risks of some hostile action from their stakeholders and if they are involved in products, services and business activities commonly used for screening purposes.

We refer to the Morningstar database in order to have a better understanding on how each company perform in the stock market over time.

Last, but not least, the data, and the standards from the Global Reporting Initiative, a widely used set of practices needed to disclose on the socially and the environmentally related activities (Brown, De Jong and Lessidrenska, 2009) and the informations each company disclose on their ethical codes (Clarkson, 1995) are used to understand how each company related to the disclosure of their various activities they carry on for their stakeholders and, in some cases, even to help in managing the relationships with some specific stakeholders (Auger, Devinney, Louviere and Burke, 2008).

We select our sample starting from companies belonging to the S&P 500 stock market index; it includes 505 common stocks issued by 500 large-cap companies and traded on American stock

exchanges, and covers about 80 percent of the American equity market by capitalization. The index is weighted by free-float market capitalization. We also refer to the Global Industry Classification Standard (GICS), an industry taxonomy developed in 1999 by MSCI and Standard & Poor's (S&P) that categorizes all major companies into 11 industrial sectors. According to this categorization, we have chosen to focus only on those companies belonging to the Consumer Discretionary Sector as it includes a very heterogeneous and diversified group of companies mostly visible and known to investors and consumers so they should be more strongly affected from the consumers' perception of the Company's CSR-related profile.
Comparing our empirical findings to extant literature, we highlight how investors' risk on financial market is aligned with evidences carried out previously.

Keywords*:* *Corporate Social Responsibility; Corporate Social Performance; Environmental, Social & Governance; Social Rating, Corporate Risk.*

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Ab.47

Measuring and Forecasting Financial Advisory Demand using a Hybrid ETS-ANN Model

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ABSTRACT

From the financial crisis it was very relevant for the providers of financial services being more competitive and attentive to the needs of the different customers. In this respect the demand of financial advisory can be considered with the aim to increase the customization of the advisory process in order to meet the expectations of the different customers (Nussbaumer et al. 2009).

A very relevant problem is to investigate on the financial investors acceptance of the risk. It is possible to define this concept as "financial risk tolerance" (Gerrans Faff Hartnett 2015). There are also important psychological factors which mediate on this concept. Financial literacy is another relevant element which contribute strongly on the financial decisions (Guiso Viviano 2014). It is crucial to observe that low levels of financial education can have a significant impact on the financial decisions leading to financial choices which can be considered sub-optimal (Gentile Linciano Soccorso 2016).

In this complex environment the role of the financial advisor is becoming growingly important. In fact the financial crisis have changed on a relevant way the perception of the customers on the financial markets (Cruciani 2017).

The demand of financial advisory is a very complex element to be estimated and measured. An approach to the measurement and the estimate the demand of financial advisory by considering google searches. In this respect the advantage on using google searches is for example, the availability of the data in real time and the possibility to use these data for operational purposes. Google searches allow a measurement of many different economic phenomena (Choi and Varian 2012). A similar approach it is considered by other authors to predict the consumer behavior (Goel et al. 2010). In this way we are able to estimate the demand of financial advisory.

The idea, here is to use a hybrid forecasting model, in which we use a two stage approach. On the first one we use an exponential smoothing state space model (Hyndman Koehler Snyder, and

Grose 2002) in order to predict the demand of the financial advisory and then we predict the residuals using the other relevant forecasting methodology. Finally, we combine both the different forecasts obtained in order to capture the different structural aspects of the original time series as well (Zhang 2003 consider a similar forecasting approach based on an ARIMA model and a neural network model). In particular, we use an autoregressive neural network model by considering the original structure of the time series to select the relevant lags. The parameters of the models optimized by considering a grid, which consider different model performance we are able to obtain.

It is possible to use this approach in relevant professional operations in fact the prediction of the demand of financial advisory can be anticipated in order to provide relevant services to the customers.

Keywords: *Big Data, Forecasting, Hybrid Forecasting, Autoregressive Neural Networks, Financial Advisory*

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Ab.48

Monetary policy's crypto currency challenge: the case of Georgia

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ABSTRACT

Due to acceleration of scientific and technological progress in the modern world, internet users is increasing sharply and requests to update the means of exchange of goods and services. As a result of this process, the cryptocurrency was created at the modern stage of the long history of money development, in order to make it independent from the regulatory institution and to maximize simplification of the transaction. Virtual currency and its growing popularity created new challenges to central banks in terms of regulating monetary policies, including the National Bank of Georgia.

The paper aims to research the restrictive factors of the monetary policy of the National Bank of Georgia on the issue of virtual money regulation, to describe and analyze the experience of other countries and develop some recommendations to overcome the challenges of the monetary policy.

The paper is based on the qualitative and quantitative methods of research. Also, we have analyzed the content of the legal documents. we used the method of statistical analysis and the review practical examples of other countries. In addition, we used questionnaires and interviews of civil society members in Georgia for gathering information and to assess the tendency of public attitudes toward cryptocurrencies. Based on the results of the survey, we have developed some recommendations for regulating the cryptocurrencies e to the National Bank of Georgia.

Keywords: Cryptographic/Digital Currency, Electronic Money, Legal Regulation, Blockchain, Bitcoin.

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Ab.49

A Bibliometric Analysis of the Investor Shareholder Activism

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ABSTRACT

The huge growth of bibliographic resources and data call for new approaches in research. In this sense bibliometric analysis was becoming increasingly popular among researchers in various fields, specifically on business studies (see for example De Bakker et al. 2005). The reason is the growth of the scientific contributions and the need to summarize the existing knowledge. So it is possible, explicitly to consider the bibliometric resources as "big data". It is also important to note that not only the dimension of the scientific literature tend to increase but also the complexity and heterogeneity of the different resources tend to grow. So in this sense it is important to use new quantitative approaches to approach differently these problems (Ferrara Salini 2012).

We need to identify the relevant scientific works, and also the contributions with new significant methodologies and relevant innovations to the existing literature. In this respect we need bibliometric approaches with the aim to extract the relevant information from a scientific literature corpus.

One of the most relevant techniques used in bibliometric analysis is network analysis. In this respect it is important to consider the original data as a network which can be explored with quantitative methodologies (Leydesdorff 2015). Social network analysis it is important on the understanding of the literature corpus in various dimensions: the different cooperation between different authors, the different structure of the literature considering citations, and finally the different themes, keywords and topics shared by the different authors. In this respect we can consider the literature belong a single sector as a network which can be analyzed by using

community detection methodologies. Of course exists also many other methodologies which can be applied to big scientific corpus. It is relevant to mention the conceptual maps obtained by multidimensional techniques useful to synthetize and find some “latent concepts and topics” on a big scientific corpus.

So, it is important to detect the most important works from the big data, and find the relevant pattern of the literature, related for example the growing new fields on the different topics. Of course on the choice of the most “relevant” quantitative methods to obtain these “relevant” works it is open the debate.

The bibliometric analysis is applied to a very relevant topic which is the shareholder investor activism literature. In United States it is possible to consider that the shareholder activism as a very important phenomenon with relevant impacts on firms (Gillan Stark 1998). Here we want to consider the evolution of the concept of shareholder activism over time and in particular analyse the evolution of the literature. In particular, by considering the large bibliographic dataset of the existing literature in shareholder activism. In this sense by considering the literature on the field it is possible to consider the most important works and elements.

There are some open problems on the literature on the shareholder activism. A relevant one is to understand the consequences of the shareholder activism. It is open the debate on the increase of the value of the targeted firms of the shareholder activism. It is possible to consider Sjöström 2008 in order to analyse if the shareholder activism is a good tool of change in various different corporate situations.

So it is necessary to analyse the literature on the characteristics of the shareholder activism and also the performances which is possible to obtain on these operations. In this sense exists a relevant debate on the improvement of the shareholder activism as an instrument to increase the firm values and also the governance structure. (Karpoff 2001)

In this sense the literature on shareholder activism need to be analyzed by using bibliometric methods. The bibliometric analysis is aimed to extract knowledge from the different networks and also from the conceptual maps related the relevant topics in shareholder activism. A relevant aim of the bibliometric analysis is to identify the works and the topics or arguments which represent a “key” on the understanding of the literature.

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Ab.50

Neural network approach to risk assessment in socio-economic systems

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ABSTRACT

In recent years there has been an increase in the uncertainty of the environment, in which socio-economic systems and their leaders interact. Therefore, the scope of usefulness of traditional methods for predicting managerial behavior has narrowed significantly. In this regard, the implementation of modern methods of behavioral economic theory can be very promising. The modeling process takes into account that the decisions made by managers are often predictably irrational, and the actions are carried out according to the same recurring scenarios. This fact underpins the development of a theory for risk management in the activities of socio-economic systems.

The growth of environmental uncertainty significantly increases the role of systematic activity in identifying of the risk factors and developing adequate anti-risk managerial impacts. At the same time, the quality of managing the level of risk of socio-economic systems is largely determined by the correctness of the applied procedures for validating anti-risk managerial impacts. The use of computer simulation and the use of artificial neural networks opens the prospect for creating models necessary to develop preventive or compensatory anti-risk managerial decisions.

The problem of modeling of the risk management processes for such socio-economic systems as, for example, production enterprises, seems to be difficult to solve by statistical methods, due to small number of homogeneous and independent operations. It would have been possible to accumulate sufficient statistical material on such operations, as it is done in the banking sector, insurance business or retail trade. Therefore, in this case the use of methods of probability theory and mathematical statistics is very limited. In this study, performed with the financial aid of the Russian Foundation for basic research (project 18-010-01042), we propose a

new approach to development of information models that support the decision-making process in management tasks dealing with the level of risk. This approach is based on the use of artificial neural networks.

Effective application of modeling with the help of artificial neural networks is constrained by the lack of standard approaches to the structure of such networks. The prerequisites for the universality of the application of this method are created when training a neural network. In the learning process, the relationship between the set of initial and final data is established.

An artificial neural network is tuned by the example of a specific socio-economic system. During the adjustment process, many identified risk factors and the propensity of its managers to take risks are taken into account. Setting up an artificial neural network is done by comparing several estimated alternatives. This algorithm can be represented as a formula that evaluates each of the alternatives connected with managerial decisions. Each element of the network – called “a neuron” – builds the weighted sum of its inputs and then passes this value through the activation function, obtaining the value of the estimated characteristic of this network element at the output.

Elements of the neural network are layered with direct signal transmission. This network can easily be interpreted as an input-output model, in which weights are free parameters of the model. This neural network allows us to build a model of a function of almost any complexity, and the complexity of the function is characterized by the number of layers and the number of elements in each layer. The number of input elements of the network is set by the set of risk factors taken into consideration. And the output elements can be treated as a change in the level of risk under the influence of each kind of factors. Interpretation of initial sets of output elements is considered as possible consequences from realization of some risk factor and is made on the basis of expert estimation. Thus, the plausibility criteria in the model are set by the subjective opinion of specialists, and this fact can be regarded as a drawback of the model.

The determination of the number of intermediate layers and the number of elements in each layer is a key issue in the design of neural networks. Two sets are used as independent variables. The first set consists of variables that describe the subject's assessment of the significance of risk factors by the criterion of the possibility of adverse events, or by the magnitude of expected damage. The second set of variables reflects the assessment of effectiveness of anti-risk managerial impacts. This assessment can take into account, for example, the life experience of a given leader or expert. The task of this study is to deduce, determine the starting form of the formula for the decision algorithm. The formula, when substituting the specific weights of each risk factor, should give relatively plausible results of the evaluation of anti-risk managerial impacts.

At the initial stage of modeling the test form of the formula is used. If at the same time a small but stable reduction in the level of risk is achieved, this means that the application of a basic set of anti-risk managerial impacts will be effective. At the next stage, a set of input variables is formed, which is loaded into the test formula, and then the likelihood of generating the model outputs is estimated. When revealing unlikely outputs, the formula is adjusted to increase the plausibility of the results it generates. Ultimately, the choice is made based on matching the expected effects for each recognized alternative.

At the subjective level, the manager determines what it means to have a reliable anti-risk managerial impact. To do this, the anti-risk managerial impact is assessed in the context of the most undesirable development of events. Conservatism of the leader is of paramount importance

in choosing the worst-case scenario for developing an anti-risk managerial impact that will guarantee maximum efficiency.

Managing the risk level of a socio-economic system means not only a rigid determination of the management system, but also "soft forms of governance." With such forms of management, various mechanisms of social impacts are used: moderation, mediation, support, incentives, etc.

The neural network approach to risk management modeling allows to correctly describe complex situations of economic risk. Such a description becomes possible without a clear idea of the formalized type of relationship between the set of initial and final data. Neural networks may be optimal as a tool for the tasks of forecasting and classifying anti-risk managerial impact.

Keywords: *socio-economic system, economic risk factors, anti-risk managerial impacts, artificial neural network.*

MARKET-ING SYSTEMS

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Ab.51

Digital Marketing - a Modern Technological Tool for Gaining Competitive Advantages in Global Markets

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ABSTRACT

Advances in the technology have given rise to technological developments that fostered rapid internet application and improved interconnectivity between individuals. The evolution of the web has changed the way organizations interact with customers, and as a result, has caused a shift in digital marketing stages (Tiago&Verissimo, 2014). Due to recent trends in technological advancements, marketing channels and consumer behavior have seen a shift, which has influenced the consumer decision-making process when it comes to product purchases. Consumers engagement with brands have changed, which forced organizations to adapt their marketing strategies to reach them.

Marketers need to update their skills in order to make the most of these fast-moving and highly relevant campaigns through Digital Marketing. They need to work closely with data specialists, web developers, and social media professionals. "The marketer of the future needs to combine marketing and creative skills with an understanding of real-time technology. "- Charles Wells 2018.

Today the question - "Why should we use Digital Marketing"? – is high on the agenda. The answer is simple. Unlike traditional marketing, Digital Marketing is less time consuming, affordable and convenient, thus one can reach a larger audience in a shorter time. Since people shifted their options to tablets, phones, and computers, it allowed Digital Marketers to use the opportunity and foster the development of Digital Marketing at a rapid pace.

Digital Marketing consists of different (various) components: e-mail marketing, web marketing, Search Engine Optimization, pay per click system, online advertisement, affiliate marketing, social media, SMS (short message service) blogs, viral marketing and mobile applications (Pew Research Center, 2015).

Digital technologies are becoming increasingly important in most sectors of economic activity (Sepashvili 2016). Due to high levels of interconnectivity, the internet has been linked to the wheel and the airplane in terms of its ability to affect the future development of business and society. Consequently, the internet has provided the impetus for many companies to rethink the role of technology, and evidence already indicates the extent of its global impact (Noaimi, 2015).

Developments enable us to state that new technological progression and especially the wide use of the internet have created a new environment, which forces all players to get engaged in Digital Marketing for the best results. Technologies do really influence the whole activities especially the marketing (Berthon, Plangger, & Shapiro, 2012).

In business, Digital Marketing requires proper management. It is a complex process of using various platforms and technologies. The future is for whose companies capable of adapting to economic and environmental changes (Gagnidze, 2016). Digital Marketing is one of the instruments for adaptation. It enables people despite their geographic locations to keep up with global processes.

The 21st century could be considered as social media century, providing unique platform for global communication. Social media marketing is the latest element of integrated marketing communication (Vasanth &Mousumi, 2012). It involves the utilization of social media to achieve the goals of the company and enhance dialogue between companies and people. Today everybody agrees with the fact that social media has become one of the most powerful tools in business. The reason is bilateral communication with consumers. Many ambitious companies today apply social media as a means for PR campaign, advertising, and brand positioning.

An interactive character of social media enables companies to better understand customers' requirements and concerns which directly deal to increased sales. It also proved to be the best tool for both internal and external communications.

Nowadays, communication companies have offered a flexible format of TV, TV commercials are less viewed. All this complicates the brand positioning through television and gives new opportunities to social media.

Companies face a need to choose efficient media for communication. Choosing between social media channels is not easy. To make a correct choice the companies should know not only

channels or types of social media but make their in-depth analysis, including it's positive and negatives sides.

Online advertising- Online advertising promotes the establishment of a company image, Today's own website is no longer a luxury item; it has turned into a successful business guarantee. The cost of advertising on the internet is much lower compared to its traditional analogs and the effectiveness of advertising on the Internet is much higher. Most importantly, there is always a possibility to control how the rating of the website increases according to the effectiveness of advertising effectiveness.

Affiliate Marketing - Affiliate Marketing is a partnership program when an advertiser pays commission to its affiliates by the visitors to purchase or for visitor registration, for downloading games or programs.

The Affiliate Program provides users with a unique Affiliate Program Link, which can be distributed through various means: by posting the banners on the website, by email, via social networks, etc. if a user purchases something via this link the affiliates will receive the commission fee.

Mobile Application- App marketing refers to the marketing of an application, or short app that can be used on various mobile devices. App marketing aims to attract the largest possible number of users for an app or widget and thereby generate revenue. App marketing can be classified as a part of mobile marketing but differs from mobile marketing by focusing on apps, whereas in mobile marketing, mobile devices are considered to be the distribution channel for advertising (Statista, 2018).

SMS- SMS Marketing is permission-based, thus each customer must have given permission to the company to send text messages to their mobile phone. Companies can collect their customer's mobile phone numbers in many different ways. Generally speaking, the goal of SMS marketing is to build a database of subscribers to increase customer loyalty. Text messages are an ideal way of notifying people within company's vicinity of any immediate offers.

Blog- Another important Digital Marketing tool is blogging. Blog pages include information on various topics, which include products and services. Blog pages are platforms for interaction, which further helps to enhance business prospects.

Viral marketing- is a marketing technique that uses pre-existing social networking services and other technologies to try to produce increases in brand awareness or to achieve other marketing objectives (such as product sales) through self-replicating viral processes, analogous to the spread of viruses or computer viruses. It can be delivered by word of mouth or enhanced by the network effects of the Internet and mobile networks (Mohan, 2015)

Keywords: *Digital Marketing, International Competition, Global Markets, Social Media.*

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Ab.52

GLOBAL EXPERIENCE OF BIO PRODUCT MARKET AND ITS CHALLENGES IN GEORGIA IN THE CONTEXT OF SUSTAINABLE WELL-BEING

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EXTENDED ABSTRACT

The aim of the paper are to analyze the global market of bio products and identify the potential and limitations of bio production in Georgia. The level of population interested in bio products and the increasing tendency of such interest is revealed. The work analyzes the level of competiveness on the market of bio products. The main providers and consumers of bio products are characterized and conclusion is made that the biggest consumption of organic products takes place in rich countries. In the basis of estimation of experts is considered that the market of bio products is one of the fast increasing and dynamic market. It is supposed that in the first half of the 21st century 40 percent of the technologies and world produced products will be ecological. Accordingly, the companies and producers are suggested to activate efforts toward this direction.

The paper highlights and discusses the indicators of the production of bio products in the European countries, their characteristics, prices and demand tendencies. The experience of European countries in the field of production of bio products is evaluated and the basic problems in this process are exposed. With the help of desk research method and comparative analysis the opportunities of the production of bio products in Georgia are identified. Problems connected with production of bio products are revealed and perspectives of development are suggested. European model of production of bio products is analyzed and by the method of comparative analysis is proved that the production of bio products falls behind the European demands. Market of bio products in Georgia is not developed at high level but research results of consumers' preferences shows that consumers support healthy food and they are ready to pay different (comparatively higher) price for bio products. Positive changes are in the agrarian policy of the state, namely in the direction of establishing legislative basis adequate for the bio production.

Biological production is to become one of the strategic directions of development of the agriculture of Georgia as the bio market in the world maintains its niche: the demand is higher than supply. In the conditions of supporting of the development of bio production from the state the bio sector has the potential to make an important contribution to regenerate the agriculture of Georgia. Together with regenerating and spreading of traditional cultures, increasing of demands of the ecologically clean products and the development of ecotourism make the best perspective of the stability of middle farming in Georgia.

In the paper some recommendations for the development of the market of the local bio products are worked out. Production of bio wine and tea are considered as potential perspectives for Georgia. With these products Georgia is able to occupy its own place of the world bio-market and succeed. The biggest producers in Europe of organic wine are Spain, France and Italy. Some of the prestigious lands turned into organic farming. In France and Horvath more than 10 percent of organic market is occupied by wine. From the developing countries the great potential of export of organic wine is to Norway, Sweden, Finland, Denmark, Germany, Great Britain, Switzerland and Australia. France, Italy and Spain they are less interested in the import of organic wine as they have their enough own production.

In the paper conclusions regarding to the problems existed on bio product's market in Georgia are made and production of bio products is considered as one of the economic activity that can play important role in the process of sustainable development and increase the level of nation's well-being. In General, European model of agriculture is desirable to be implemented in Georgia. Investigation of experience of different countries with best agricultural practice plays significant role in identification of agricultural policy priorities in Georgia and in elaboration of practical recommendations for farmers and for the whole industry. Given article discusses the current tendencies of global agriculture and agricultural policy in general and analyses the ways of how it might stimulate bio production. Paper also discusses the peculiarities of the European models of farm's diversification, opportunities and limits of family farms in the European Union and considers the bio production as one possible way of farms diversification. The article argues that in the European Union family farms are considered as a key element of the European model of agriculture. Family farms make multifarious contribution to the European Union and to its rural economy. In Europe around 97% of farms are family farms. The European Union through its agricultural policy continues to stimulate sustainable and competitive agriculture. Family farms, often as diversified and pluriactive farms, should be considered as key element of Georgian model of agriculture.

Keywords: Agriculture, Agricultural policy, Bio Production, Bio Wine, Country's Competitiveness.

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Ab.53

Agro Tourism for Economic Development of Related Sectors and Sustainable Well-being (Case of Georgia)

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ABSTRACT

A huge number of studies point out the importance of sustainable productivity growth in global agriculture, in particular for developing economies. Often, it is considered one of the main driver of sustainable economic growth in agricultural sector. This is true for Georgia as well. Improving agricultural productivity, while conserving and enhancing natural resources, is an essential requirement for farmers to increase global food supplies on a sustainable basis. The success of developing countries in increasing agricultural productivity will have global implications in strengthening the resilience of food markets, enhancing food security, improving wellbeing and promoting sustainability. Besides the agriculture tourism sector in general have had a positive influence on output and productivity, especially in poor economies. Tourism can be one of the most important vehicle for growth and growth-related reforms in under-developed countries. However these countries have many political, institutional and economic problems that must be undressed in order to overcome vicious circle of poverty and increase the level of well-being of nations. It can play significant positive role in addressing these issues. However new and innovative approaches are needed for fostering economic growth and development in global arena and in poorest countries. Agro tourism and related sectors can be one such new way for developing countries struggling with poverty and unemployment. In agriculture the productivity of farms can be improved through economies of scale and the adoption of more technically-efficient production systems. However, long-run productivity growth for the sector as a whole requires continuous technological progress, as well as social innovations and new business models. For agriculture to respond to future challenges, innovation will not only need to

improve the efficiency with which inputs are turned into outputs, but also conserve scarce natural resources and reduce waste. Agro tourism and related sectors can be based on such business models that take into consideration sustainable economic development.

Given paper characterizes the potential of agro touristic areas of Georgia for sustainable economic development, analyzes advantageous geographical location, peculiarities of relief, folk diversity, etc. The article urgues that in terms of efficient use of tourism resources, it is possible to develop agroproduct and related sectors with the competitive advantage, maintain the identity of the population, balanced development of local economy, cause an appropriate multiplier effect by creation of business opportunities, employment and income growth, etc. The paper estimates the functions of agro tourism according to the categories; in particular it analyzes the social-psychological, economic, spatial and environmental functions.

The problems existing in agro tourism are revealed based on the survey of experts and tourists, in particular, these problems are underdeveloped infrastructure, shortage of suggested tourism products, low level of services, low level of accessibility to information resources, etc. The following needs are identified for the development of agrotourism and the related sectors by foreign tourists: informing tourists about new services in agro tourism in time, differentiation of products according to focus groups, direct selling of farmers' products to tourists, usage of this advantage by the municipalities with attractive tourism environment and attracting tourists, etc.

The following positive effects that accompany development of agro tourism are identified: development of related sectors, creation of additional jobs, new sources of income for rural population, maintaining production of traditional products and opportunities for entering new markets, increasing employment of young people in agro tourism and related sectors, etc. Based on the identification of the problems, the possibilities for the development of agro tourism and the related sectors in socio-psychological, economic, spatial and environmental directions are suggested.

Given paper also highlights the role of wine tourism in united concept of agro tourism. It is impotent to make distinction among different types of products: products that are directly connected to agrarian environment, agrarian product and agrarian location. In order to reveal the problems in the field of agro tourism researchers use different relevant criteria. Given research emphasises the role of the concept of the place in the development of agro tourism, studies the motivation of individuals toward to the tourism. In given paper comparatively perfect criteria offer by Lane (1992) is used. Lane criteria implies to evaluate the agro touristic places according six factors. The attractive touristic environment is estimated by the following criteria: historical-cultural heritage, untouched (original) natural heritage, tourism infrastructure, ethno physical environment, agro-cultural landscapes, food products (kitchen).

By using methodology of Lane criterion research results identify most attractive Georgian municipalities for the development of agro tourism according to the average rate of attractiveness of the regions. The paper also substantiates the possibilities for development of related sectors in these Georgian municipalities. Findings of the research suggests that the advantages of different Georgian agro touristic areas are: ancient civilization and culture, untouchable natural inheritance, rich flora and fauna, hospitality and cousine, rich traditions and

etc. Agro tourism doe not require big investments and expenditure for organizing recreational and welcoming events for tourists who seek for relaxation in ecologically friendly environment at lower expenses.

Keywords: Agro tourism, wine tourism, vine-growing, agro touristic areas, Lane Criteria, economic development, sustainable development.

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CORPORATE REPORTING SYSTEMS

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Ab.54

Accounting and Economic Calculation Logic to Determine Corporate Results

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ABSTRACT

The meaning and functions of the annual financial statements – documents that provide information on economic results and the financial position of a firm (company) – has for some time now been explained in accounting doctrine. These documents are prepared based on a reliable and efficient accounting system and have the technical-accounting function of determining the annual results and the working capital at year's end by following a set of commonly-accepted "accounting principles" established by the doctrine and by accounting practices. Nevertheless, the financial statements also have an important information function, as they represent the only document that allows "third parties" to acquire information through the analysis of the statements to evaluate the economic and financial performance of the firm as well as the prospects for organizational continuity.

This study seeks to demonstrate that the financial statements represent a document aimed exclusively at "third parties", that is subjects without access to the information system of the company, rather than at the entrepreneurs or management who possess more detailed internal information. There are two main reasons for this assertion: a *functional*, accounting logic reason that concerns the informational *utility* of the data in the statement, and a *substantive* one that concerns the economic logic regarding the informational *quality* of the statement entries.

Functional reason. The financial statements are summary documents that provide the overall aggregate values – costs of inputs, sales revenue, operating margins and annual result – that refer to the entire portfolio of businesses and products of the company during the year of reference. Therefore, they are not aimed at entrepreneurs and the management that represents them since the information they provide has limited utility for strategic and management ends. A much more powerful informational tool is available to entrepreneurs and management in the form of *management* (*managerial*) *accounting* and *analytical accounting*, from which information can be gained regarding the values and results of the individual businesses, products, branches, etc. The annual financial statements represent summary documents providing information on the profits and losses of a company as a unitary system rather than more useful information on the economic

contribution of the analytic results of the businesses, products, branches, etc. to the overall result. The latter can be included as discretional details in the report on management performance, where it is presented to "third parties" by the company.

Substantive reason. We must first distinguish between an *accounting* calculation logic and an *economic* one. An *accounting calculation* logic is the procedures and conventions followed in financial accounting to determine the company's results. The accounting activity determines the values that arise in the exchanges undertaken based on management decisions, arranging them in accounting reports. Therefore, the accountant is, so to speak, in a subordinate, passive position, while management, since it decides and carries out management operations, actively contributes to the creation of these values. An *economic* (or managerial) *calculation* logic is the method and procedures followed by management to calculate the values linked to management operations, which typically are represented by production costs, prices and periodic revenues. There are therefore two types of data used to determine a company's results: the accounting calculation data and the economic calculation data. It is argued here that the following *general rule* can be posited: the values the accountant compiles based on the *accounting calculation* logic must (should) conform to those found by adopting the *economic calculation* logic: *ex post*, if already produced, *ex ante* if yet to be produced. From this it follows that the values in the financial statements must be capable of producing the same economic results determined using both the *economic* and the *accounting calculation* logic.

Nevertheless, the economic calculation does not always produce the same values as the accounting calculation. For example, the specific (analytic) gross economic results of the sequential production processes carried out entirely during the year are calculated based on the rules of the ex post *economic calculation*, which in several cases may not coincide with the *accounting calculation*. Based on the *accounting principles* centered on the concept of the recovery of investment (cost), the *accounting logic* normally values the stocks at year's end at a level not higher than the *historical purchase or production cost*. On the other hand, the *economic logic* can follow different principles. Above all, it can also include in the stock value a corresponding share of the revenues that will be produced at the end of the production cycle. In addition, from an economic point of view, in adopting the method focused on the *capacity of reproducing* the production processes it is proper to calculate the value of the inputs and the stocks based on the *replacement cost*, according to an ex ante economic calculation during the planning phase.

There are, however, other relevant circumstances that can lead to (even significantly) different values for the ex post *economic calculation* compared with the *accounting calculation*. In such circumstances, the financial statements showing the company's results based on the accounting calculation would not be suitable for satisfying the information needs of the entrepreneur-management. The multiple factors that produce different values in the *economic calculation* logic as opposed to the *accounting calculation* logic can be divided into a few categories, of which the following are the most significant:

1) the accounting calculation logic views all costs and revenues, no matter their source: the economic calculation logic always discriminates between necessary and non-necessary costs, necessary and residual revenues, and operating and investment assets;

2) the economic calculation logic normally considers the *replacement costs*, not the historical costs; on the other hand, general accounting observes the historical costs, inferring these from the original documentation about buying and selling activity;

3) to respect the *matching principle*, according to the accounting calculation the *depreciation quota* of long-term assets is calculated taking as a base the historical cost less the recovery value at the end of the life of the asset. On the other hand, the economic calculation considers the *replacement* cost plus the costs for the restoration of the environment after the elimination of the asset;

4) the economic calculation must always verify the *uniformity of the values* on which the calculation of the economic results are based; more generally speaking, their *compatibility*. It must therefore adjust the values deemed non-uniform, both in *financial* and *actuarial* terms, and above all in terms of the variability of the *monetary unit* the values are expressed in (stable unit principle). One of the main reasons for the differences between the accounting and economic calculations logics arises during inflationary periods, when accounting bases its valorization and estimates on the cost principle, while the economic calculation has different methods for achieving uniformity, among which the CPPM (Current Purchasing Power Method) and current value accounting;

5) the economic calculation can consider the *opportunity costs*: those costs linked to the *non-optimal use* of factors in a given production process with respect to more optimal alternative processes. Accounting is not required to take account of opportunity costs;

6) the economic calculation must also consider the *figurative costs* of factors with *residual* and *contingent* remuneration, costs which, based on the accounting calculation, cannot be immediately included in the financial accounting since the conditions do not exist for their formal valorization. In particular, the economic calculation can also include the *cost of equity* in production costs.

It can be shown that the economic results determined based on the accounting calculation logic that are not in conformity with the economic calculation logic would only be *nominal*: useful as information for "third parties". On the other hand, the results based on the economic calculation logic would represent the *operational* results aimed at decisions by the entrepreneur-management. It can also be shown that the economic result is meaningfully expressed not in the annual financial statements and the management report but in the managerial statements prepared during the management accounting processes. The data in this case can thus be further employed to readjust the accounting calculation values to make the necessary additions to restore the identity between the *economic* and *accounting* calculations.

This study will first provide an in-depth treatment of the concepts of *accounting calculation* and *economic calculation* logic and then analyze the six main differences between the two methods as well as the way to reconcile the results from the two methods, presenting concrete numerical examples to support the discussion.

Keywords: *financial accounting, management accounting, annual financial statements, accounting calculation logic, economic calculation logic, substitution costs, opportunity cost, Current Purchasing Power Method, book values kept at current values*

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Ab.55

Social Economy Sector and Voluntary disclosure: the potential role of social reporting in the decision making process of cooperatives

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ABSTRACT

Introduction.

During the last decades, different theories have been elaborated in an attempt to motivate the use and diffusion of various methods of social reporting:

1. the information usefulness approach for readers' decision-making purposes (Gray et al. 1995). This approach considers as a priority the users point of view: the accountability tools should be useful for the decision making process of their readers;

2. the theory of legitimation (Dowling and Pfeffer, 1975). On the basis of this theoretical approach, the focus is represented by the point of view of the community: a company pursues the continuity of its activity by adopting behaviors deemed socially acceptable. This in order to obtain the social legitimation necessary for the company to remain in business;

3. the stakeholders' theory (Freeman, 1984), according to which each company has different interlocutors to which it is required to report on its activities in an appropriate manner;

4. the theory of the political economy of detection systems. On the basis of this approach, the company information system can influence the perception that the civil society has of the company, influencing the citizenship's expectations towards the company (Woodward et al., 2001);

5. the positive theory of detection systems (Watts and Zimmermann, 1978). It relates the definition of accounting principles and profit maximization objectives pursued by the

management. An application of this theory to social reporting leads to consider it as a tool used by managers to achieve their goals of maximizing income in the short term (Milne, 2002).

The literature on the topic of social accounting and accountability is abundant and highlights the benefits and motivations supporting voluntary reporting. Among them, for example: the development of a more informed decision-making system (Burrit, 2012), the maintenance of the stakeholders' approval (Adams and Zutshi, 2004), the management of the reputation and its value, also in terms of income generation (Spence, 2009).

In addition, some scientific contribution highlights the need for further studies to investigate the integration of social and environmental issues into decision making processes (Burrit and Shaltegger, 2010; Searcy, 2012). In fact, it is considered of particular interest to understand the ways in which the information contained in the voluntary reports do not remain an end in themselves, but influence the decision-making processes of their users.

In this work, the authors also consider that the cooperatives are going through a very critical period dictated by the need to pursue the competitiveness of other cooperatives and other non-cooperative companies operating in the same sector, without betraying their traditional reference values (first of all that of mutuality).

Research question and objective of the paper.

The objective of the paper arises from the literature review that highlights how more in-depth studies are needed on the characters and role of social accountability in decision-making processes. In particular, this paper contextualizes this research opportunity in the context of a particular type of organization of the Social Economy Sector: the cooperative.

As a consequence, the research question that guides this work is: "How is social reporting performed and how do social information influence decision making of the management in a cooperative?".

In other words, the authors try:

- to describe the social disclosures of a cooperative (in term of social reporting structure and contents);
- to analyse the process followed to collect these social disclosures (in order to understand how a cooperative can define structure and content of the social report);
- to highlights the impact of the social reporting on the (strategic and/or operational) decision making process of the management in a cooperative.

The authors choose to investigate specifically the social reporting given the particular nature of cooperative companies (characterized by the mutualistic purpose) that should bring these organizations to a particular attention to the social consequences of their activities. Besides, the authors consider a specific category of stakeholders represented by the management, in order to define if their decisions are affected by social disclosures.

Research methodology.

In order to reach the aim of the paper, considering that (i) the research question is explanatory, (ii) the authors intend to analyse a contemporary phenomenon in relation to which (iii) the main behaviours can not be influenced by the researcher, the research methodology followed is the *case study* (Yin, 2009).

The case study methodology - that in this research is explanatory (Turrini, 2002) - leads to a theoretical generalization (Foster et al., 2000): in effect, the analyses of specific socio-economic organizations considering the managerial choices made in the same, do not allow the researchers an empirical generalization related to an aggregate of elements because of the presence of several specific elements that characterize the analysed organization (Gillham, 1999).

In particular, developing the research design, the single case study methodology has been adopted (Eisenhardt, 1989; Baxter and Jack, 2008). In effect, the authors decide to analyse how Coop Lombardia (an Italian consumer cooperative) faces the social reporting and how the social report impact on the internal decision making process.

The research design considers *embedded units of analysis* and this highlights how the case study allow us to analyse the research objects (social reporting and decision making process) from different points of view (integrating the collected data and information): the Social Report, carrying out a document analysis; the top management of Coop Lombardia, that represents the point of reference of the social reporting and the internal decision making processes, carrying out semi structured interviews.

Expected results

The expected results of this research are mainly two:

- to identify strengths and weaknesses of the social reporting in a cooperative, also in order to supply some useful critical elements to other organizations of the same type that are involved in the drawing up the social report;
- to understand if and how the social reporting impacts on managerial choices, trying to identify the most useful social information for the management.

Contents.

The chapter will be developed in the sections briefly summarized below:

- ***Section 1***. Literature review on the concept and the role of social accounting/accountability.
- ***Section 2***. In this section the Authors identify the research question arising from the literature review. The paper is aimed to explore the potential role of the social accounting/accountability on the decision making process in retailing cooperative.
- ***Section 3***. This section contains the case study analysis. The case study is represented by the Social Report of Coop Lombardia. The analysis highlights both the principal characteristics of the documents and the process followed to drawn it up. This analysis, together with the interviews done to the top management of the investigated cooperative, allow the Author to

understand if and how there are some potential impact of the social tool on the decision making process of Coop Lombardia.

- ***Section 4***. Conclusive reflections on if and how the social accountability process and document analysed may affect the decision making process in a cooperative.

Keywords: *voluntary disclosure, social reporting, cooperative*

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Ab.56

Innovative Approaches in Higher Education System

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ABSTRACT

We believe that initiation of two different ideas simultaneously in one work would be more helpful for discussing the topic. Among those are:

1. **New paradigm of education system**

The problems occurring due to digital changes very often arise before the possibilities to respond to them. Politicians, scientists and qualified professionals try to solve the problems in a traditional way. Traditional culture, first of all, requires specifying and determining the problems faced by the society and economy and, in some cases, inclination to risk. Therefore, everything that we come across (and have learned) in scientific theories and practices are no longer sufficient. In terms of digital economy being developed, focusing only on experience and determination serves as a hindering factor for introduction of innovations and sustainable development. This especially refers to the decisions to provide rapid and effective responses to the changes in the market system under uncertainty. The drive of scientific and technical progress is a human (at least so far). Therefore, first of all, it is people, who must change themselves and all the institutions they have created. The higher education system is the most important of these institutions.

Students and professors should equally undergo the changes in the higher education, i.e. the university education system. According to the new paradigm, the *growth of consciousness* of a human should be based on intellectual development. Accordingly, the human *goal is intellectual development based on continuous learning*. Striving to achieve this goal should be assessed as a success. Assessing any other kind of development, except the intellectual development, as a success might be unsuccessful for the society (or the state). The main

instrument for achieving this goal is to establish the system of continuous education and learning (Gogorishvili, 2014). There are numerous goals that are subject to this goal or depend on it. Table 1 presents the goals and tools focused on establishing a growth-oriented mentality.

Table 1. Advantages of developing a growth-oriented mentality

The growth based on gaining knowledge and talent (on the basis of learning) (a long-term goal)	The growth based on fixed, inherent capabilities (a short-term goal)
Arises a desire to learn	Arises a desire to look intelligent
Perceiving problems as opportunities for learning and growth	Perceiving problems as obstacles that should be overcome by avoiding them
Learning based on failure	Mitigation and liquidation of the results of failure
An increase in the desire to learn because of the success of others	A feeling of envy and fear because of the success of others
Well suited for: teamwork and cooperation; making extraordinary decisions in terms of high uncertainty; the problems, which require innovative and risky approach to be solved.	Well suited for: individual working; making ordinary and making experienced decisions; the problems, which require good knowledge of past experience to be solved.
Opportunities for new missions in science and economics.	Opportunities for testing and evaluating existing missions.

Changing the mentality of students and professors is a prerequisite for evaluating higher education policy as successful. It should be introduced by using appropriate tools of the proper policy.

2. The role of entrepreneurial universities in formation of an entrepreneurial ecosystem

The World Economic Forum, in collaboration with Stanford University, Ernst & Young and Endeavor, surveyed over 1000 entrepreneurs from around the globe and in 2014 introduced the Report “Around the Globe and Early-Stage Company Growth Dynamics – the Entrepreneur’s Perspective”. In this report, there are given eight pillars and components of an Entrepreneurial Ecosystem (WEF report; p.17). This model builds on the previous work on entrepreneurial ecosystems by EY, the OECD, and Professor Daniel Isenberg.

The pillars and components of an Entrepreneurial Ecosystem are: Accessible markets (Domestic market: Large companies as customers; Small/medium-sized companies as customers; Governments as customers. Foreign market: Large companies as customers; Small/medium-sized companies as customers; Governments as customers); Human capital/workforce (*Management*

talent; Technical talent; Entrepreneurial company experience; Outsourcing availability; Access to immigrant workforce); Funding and finance (Friends and family; Angel investors; Private equity; Venture capital; Access to debt); Support systems/mentors (Mentors/advisers; Professional services; *Incubators/accelerators*; Network of entrepreneurial peers); Government and regulatory framework (Ease of starting a business; Tax incentives; Business-friendly legislation/policies; Access to basic infrastructure; Access to telecommunications/broadband; Access to transport); Education and training (Available workforce with pre-university education; *Available workforce with university education*; *Entrepreneur-specific training*); Major universities as catalysts (*Promoting a culture of respect for entrepreneurship; Playing a key role in idea-formation for new companies; Playing a key role in providing graduates for new companies*) and Cultural support (Tolerance of risk and failure; Preference for self-employment; Success stories/role models; *Research culture;* Positive image of entrepreneurship; Celebration of innovation) (WEF report; p.17).

The three strongest pillars for Europe are human capital/workforce (81%), accessible markets (72%) and education and training (60%). The average percentages for ready availability across the eight pillars for region is on the first place by 86%, US – Silicon Valley/Bay Area (WEF report; p.13).

It should be noted that the universities have direct positive impact on 5 components of the above 8 pillars. These components in the text are marked by the italic font. This opinion is strengthened by the fact that the region, where Stanford University is located, has the best indicator. This university is one of the most successful entrepreneurial universities in the world.

Thus, we can conclude that entrepreneurial universities play the significant role in the formation of an entrepreneurial ecosystem. At the end of the 20th century, a new term "entrepreneurial university" appeared in the scientific literature to describe universities that have improved various mechanisms to promote regional development and increase their incomes. Additionally, other terms used have been: University Technological Transfer, Innovative Universities, Business Universities and Market Universities. For more clarity we will provide the views of some scientists, namely, Audretsch (2014), Etzkowitz and Leydesdorff (2000), Di Fatta et al., (2018), Vesperi and Gagnidze (2018), Vesperi et al., (2018), etc. The entrepreneurial universities create a sort of micro-system around themselves and form a cluster after a certain period (Gagnidze, 2018).

On the other hand, we'd like to discuss one more report "The Global Entrepreneurship Index 2018" by the Global Entrepreneurship and Development Institute (USA). According to this report a range of entrepreneurial framework conditions are: "government, research and development, education, infrastructure, financial sector and the corporate sector" (GEDI, p.20). Based on this document, we can note that entrepreneurial universities improve the entrepreneurial ecosystem.

The Georgian scientist-economists also actively discuss the importance of entrepreneurial ecosystem (Aladashvili, 2018), formation of entrepreneurial thinking (Lekashvili, 2015; Papachashvili, 2016), SMEs development (Gagnidze et al., 2017; Gogorishvili, 2018, Papachashvili, 2018), use of Internet in higher education (Surmanidze and Tsetskhladze, 2018), innovative cluster development (Sepashvili, 2018) and other issues related to the formation of entrepreneurial ecosystem in Georgia.

Keywords: Education system, new paradigm, digital economy, entrepreneurial university, entrepreneurial ecosystem.

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Ab.57

State Economic Policy for Regulating Digital Economy in Small Countries

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ABSTRACT
The paper deals with the basic directions of the state regulatory policy for the development of digital economy - the state regulatory policy for the interaction of introduction of Big Data, cloud computing, crypto currencies and block chain technologies and the artificial intelligence.

Introduction
Purpose of the paper is to describe the directions of formation of the state regulatory policy to encourage digitizing the economy in small countries and possibilities to solve the problems of formation.
Methodology: Factor analysis and expert evaluation methods are used in the paper.
For the further development of digital technologies, internal as well as external barriers to these technologies are very important. Pressing issues with regard to external barriers are stability of the country's economic and political system and insufficient level of infrastructure development for information technologies. As the scientists suggest (Vesperi, W. and Gagnidze, I. 2018) readiness by suppliers and consumers to use digital technologies is also very important. (1)
The main directions of the state regulatory policy for the development of digital economy
Significant changes arise in the process of development of digital economy. They are due to two reasons. These reasons are:

- A general tendency to reform the legislation in the fields of digital economy in different countries around the world; and
- Specific political situation caused by global conflicts of economic interest.

The effects of using Big Data technologies are minimized in case the state tightens the regulation (e. g., expanding the list of limited access information, which often happens in small countries). The changes lead to searching for compromises (between economic interest groups) to achieve balance in the use of Big Data technologies, which does not always have a successful end. (2)
Cloud computing technologies are developing rapidly. **Any invention in this field should become an innovation only together with insuring the risk (related to the invention)**. In this case, it will be possible to avoid negative effects.
Crypto currency is neither money, nor a foreign currency. Therefore, it is not a subject to financial regulation. The effectiveness of regulating mining of crypto currencies (or the assumptions about the loss due to selling it) is doubtful. (3), (4), (5).

In small countries like Georgia, the issues of crypto currency mining and trade are not regulated by the state. It is difficult to predict that this will become possible in future (except the decision to ban the trade).
Regulating the process of using artificial intelligence and machine learning and its outcomes is more obscure. In such situation, it is rational to distinguish between the users of the machines with artificial intelligence (e. g., owners of the vehicles or robots), automobile manufacturers and insurance companies. Automobile manufacturers in small and developing countries (manufacturers are developed countries) are out of the national regulation sphere. This leads to the need for developing international regulations. There are no regulations on international level as yet. This causes fear and distrust towards the results of using artificial intelligence in small countries. These problems hinder technical progress around the world. (6)

Conclusions

The use of digital technologies beyond the legal frame makes large-scale introduction of these technologies and their regulation by the state difficult or impossible. The situation is even harder in small countries (due to insufficient resources).
The state policy supporting introduction of digital technologies in small countries (including Georgia) should be implemented in two directions:

- It should encourage digitizing the economy. Otherwise, it will be impossible to integrate into the regional digital markets. Integration in the European DSM is essential for Georgia - a small open economy. Its precondition is the formation of digital economy.
- On the other hand, insurance of the risks (through developing legal, economic and political mechanisms) accompanying the digital economy in small countries is practically unachievable.

Some of the important problems related with the state support and regulation of the development of digital economy are lack of investment resources and IT specialists, emigration of the local specialists and lack of political will.
The institute, which will develop special standards by using information technologies, should be established in small countries. In addition, such institute should create economic and political conditions for the development of digital economy.

Keywords: *economic policy, digital economy, information technologies, small countries.*

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Ab.58

Factors Conditioning the Growth of Outsourcing Role in Contemporary Economics

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ABSTRACT

In the paper, there are surveyed new approaches in the sphere of employment. Contemporary business and world passes through constant changes and more and more novelties are emerging. One of such things is outsourcing. In contemporary world, it is impossible to be successful without using informational technologies, also it is important, that the means, which are used by companies in their own business processes, should be well working and the risk of hampering them should be reduced to minimum.

Actuality of the problem is conditioned by the fact, that Georgia, as a country with small economy, is actively engaged in globalization processes, where internet plays an important role.

Historically, working places are determined geographically. Working and living places of employed are tightly connected with each other. This relation has changed sharply by broadening use of internet. It is possible for supervisors, workers and final consumers of the production of the same company to live in various parts of the world.

Developing internet technologies gave a possibility to people, who have low income, to find a new job; there is emerging different type of outsourcing - digital platform of labor, where clients create new jobs. Development of outsourcing would be unimaginable without the internet.

Outsourcing was recognized as a business strategy in 1989 year and since 1990 year, it became indivisible part of business and economics. Practice of outsourcing has caused diverse opinions in many countries. Those, who deny it, assert that because of it, internal jobs were lost, especially in an industrial sector. Supporters claim that outsourcing stimulates enterprises and companies to direct resources where it is most effective, also it supports maintaining the nature of market

economy at the global level. Outsourcing can reduce company expenditures on working force. In addition, enterprises can avoid overhead costs generated by technologies and armaments.

Outsourcing of business processes is one of the most important and demanded directions at international market, because nowadays many international companies apply such a practice and manage necessary services in various countries. The main thing why companies apply outsourcing is saving money – employed needs a salary, working place in the office etc. that is usually more expensive than the costs of the company hired by outsourcing. For making certain type jobs company prefers to delegate concrete job to professional service company instead of creating staff and take someone on the one. For example, it can be cleaning company - instead of cleaner, legal service company - instead of lawyer, auditing service company – instead of accountant, computer service company – instead of the specialist of computer systems etc.

In the case of outsourcing service, company receives the service of not one person, but that of the team consisting from high-professional persons. In the case of outsourcing also it is possible to get service in an uninterrupted regime – sickness of staff may be reflected badly on the company's activity if the one does not have a substitute, the problem which is lacking in the case of outsourcing. Outsourcing differs from standard procedure of taking someone as a staff, outsourcing company plans everything together with a client, takes responsibility on its realization and conducts concrete activities for fulfilling the plan.

Outsourcing service is especially advantageous for small companies and for those countries, which have a deficit of qualified personnel and besides that, do not have the time for training them. In Georgia also, there is a practice, when a company uses various outsourcing services because of the lack of desired personnel. Many companies prepare qualified personnel with the help of the electronic teaching, which is the distance teaching conducted by computer technologies. Unlike classical methods of education, internet teaching has an advantage in organizational respect. Accessibility, simplicity – are main advantages, also flexible graphic (Surmanidze and Tsetskhladze, 2018).

In small and medium-sized companies, it is difficult to create qualified teams of certain fields (finances, accounting, legal support, logistics and informational technologies), take care of their everyday development and motivation. The most complicated among these directions is informational technologies, because in Georgia there is significant lack of qualified personnel in this field, while their salary requirements are sufficiently high. Delegating these functions to professionals for getting high quality service is considered as the only rational decision. In the developing countries for supporting the expansion of such outsourcing, it is important for educational system to prepare specialist of international standards, for this aim universities have a special role. (Vesperi and Gagnidze, 2018).

Outsourcing service has more and more fastened the process of globalization and gave the possibility to various countries or companies to establish business relations in a simple way in any country of the world without formal restrictions and borders.

Keywords: Outsoursing, Business, Internet economy, Technology, Globalisation

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Ab.59

Motivational Aspects of Potential Emigration of Students and Youth within the Next 5 years (2018-2023)

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ABSTRACT

Georgia is among one of those countries, where external migration played and still plays an important role in the formation of population and workforce. Consequently, the article aims to briefly present positive and negative factors currently affecting the migration of the Georgian population from the quantitative as well as qualitative standpoint. In this regard, the work pays basic attention to the potential migrants, namely, to the migration behavior and motivation of the student-youth, the knowledge of which is vital and necessary in terms of social-demographic and economic viewpoint for any country, especially for the authorities and wider society of a country with a small number of population.

The qualitative indicators of the potential migration are primarily studied on the basis of the April 2017 research conducted by the Ilia State University's Institute of demography and sociology (1500 students were interviewed) concerning migration problems among the student-youth, as well as on the results of researches conducted by Georgian scientists, etc.

On the verge of depopulation, under the circumstances of zero natural growth of population, the fact that emigration exceeded immigration determined not only an important reduction of the population, but also the deformation of age-sex structure (increase of demographic aging) and change in the national contingent. Emigration is especially intensive among the members of the population who are capable of working and are in an active reproductive age.

Since April of 2017, the introduction of the visa-free travel regime within the countries of the European Union, gave a new impulse to the dynamic of migration process.

On the contemporary stage the migration processes of Georgia are essentially associated with the neoclassical theory of migration. Inasmuch as the Georgian economy is characterized by the high

share of labor compared to the capital, and a low market salary. At the same time, the developmentally advanced countries of Europe stand out by the low share of labor in comparison to the capital, and the high salary for the hired individuals. Exactly this distinction compels Georgian population toward emigration to the highly developed foreign countries. The decrease of the work force together with its human capital did not lead to a significant growth of their salary in Georgia. In spite of the fact that the Georgian emigrants (especially illegal workers) working in the highly developed foreign countries, receive a smaller salary, compared to Georgian standards, in those countries the salary of even the dilettante workers still significantly exceeds the existing income of those people who are toiling at a highly qualified jobs in Georgia. This is the main reason why the emigrants refrain from returning to their motherland.

Besides economic factors, emigration from Georgia is also associated with such social-demographic factors of sociological theories as are: receiving education, exile, the desire to live in better conditions, etc. These factors significantly determine the positives of migration in the receiving developed countries and the negatives in Georgia. Consequently, the bigger the difference between the positive and negative factors of migration, the higher is the expected emigration toward other countries and the possibility of staying there.

It is apparent from the data of the 2014 population census that from the total number of the emigrants with higher, professional and secondary education almost half (49.3%) with the share of more than 10% are represented in the following countries: in Russia (21.6%), in Greece (16.2%), in Turkey (11.5%), and in Italy (11.1%). Among those people 64.4% of the ones possessing higher education live in Russia, Italy, Greece, Germany and the USA. Unfortunately, the majority of these people are principally illegal migrants working in the spheres of teaching, engineering, medicine and technical fields. However, they do not employ their own occupation, and therefore, occupy the place in the secondary labor market, which causes their actual disqualification. Additionally, because of the high demand of the specialists with higher education in Russia, the number of migrants would have been even higher if it was not for the strict visa regime with Russia and the deportation of emigrants in 2010. It was precisely because of it, that there was an increase in number of not only those, who wish to go from Georgia to foreign countries, but also those, who wish to come in Georgia for studying. According to the data of National Statistics Office of Georgia, for example, for the beginning of 2016-2017 academic year 565 students went abroad from Georgia for studying (Surmanidze and Tsetskhladze, 2018).

Furthermore, based on the analysis of the material of the 2014 population census, we can assert that on every level of educational structure, the biggest share of those emigrants who have higher education live in Germany, USA, Italy, Greece, Spain and France. As opposed to them, the largest share of the emigrants with professional education falls on Greece, Russia and Italy. With regard to the emigrants who possess only secondary education, their number in Russia exceeds that of other countries, and they are highly represented in the general structure of educational levels.

The general population censuses of the 2002 and 2014 manifested that among the factors for emigrating abroad the two factors are essentially highlighted: employment and the motivation to receive education. Taking into consideration the fact that in upper ages the migration potential of population gradually diminishes, whereas in youngsters, especially among students, the motivation for going abroad is prominent, it is interesting to get their opinions as potential migrants about the possible motives, reasons and factors of going abroad.

It became clear that 42.7% of the interviewed students plan on going abroad. Provided there are more than 100 thousand students in Georgia, it follows that approximately 43-45 thousand students are determined to leave the country. The average duration for studying at university level (baccalaureate, master's) is nearly 4-5 years, taking into account the number of the relevant contingent. Consequently, the contingent of those students who want to go abroad reaches over 10 thousand on every course. At the time when, recently, the average number of the youngsters enrolled at higher educational institutions is within 30-35 thousand.

It must be noted that the two main motives for exiting the country are receiving-increasing education and getting a job. The share of the people who have those two motives is more than 9/10 of the ones willing to go abroad. Approximately 3/5 of the people willing to go abroad plan on leaving within the next 3 years, and 2/3 of them are determined to leave later. The motivation to exit the country is higher among women than among men; as a result, 59.6% of the interviewed student men and 52.0% of the women (on average – 55.6%) are prepared to stay in the country.

Long-standing statistics of the world migration bears witness as to the fact that the half of the migrants do not return home. The results of *the mentioned research wholly fit into this context, according to which nearly half of the people* (49.8%) willing to go abroad plan to return to their homeland. 47.0% of the ones willing to go abroad plan to make a decision about staying abroad after graduating. 3.4% of the students reach a final decision to not return to their homeland. Among those youngsters, 350-400 have already made up their mind about not returning to Georgia. Based on the fact that the negative migration balance of Georgian citizens annually amounts to nearly 15 thousand, we can assert that approximately 1/3 of those students consists of the contingent who have just finished their university studies, as a rule first stage (baccalaureate) in Georgia and are leaving the country to seek education and "try their luck".

It merits mention that there is not a single clearly defined factor in the motivation to go abroad. Several circumstances play defining role here. For example, *34.2% assumes that there are more chances to find a job in Georgia once you get your diploma abroad; 12.1% thinks that going abroad to study will give them an opportunity to find a job and stay there to live*. On top of that, among men to find a job is a prevalent motive, whereas women prefer to employ themselves in studying.

The geography of exiting the country possesses multiple vectors and people primarily are ready to depart for Germany (37.2%), the USA (16.8%), the United Kingdom (11.4%), Italy (5.4%), France and Russia (3.4%).

The survey showed that nearly every fifth student (21.3%) does not speak any other (foreign) languages save their own native tongue. Approximately half of the students (48.8%) know English language, 22.4% speak Russian and 6.6% know German. In addition to that, 14.9% of the students are proficient in two languages and 3.4% in three. Among those students who know Russian 56% also speaks another foreign language (51.9% speaks English and 4.1% German).

Almost 3/5 of those who know English plans on moving to the countries (the USA, the United Kingdom), where English is an official language. For the rest of them, knowledge of English is the means to enhance their education or find work in other countries. In this respect, Germany deserves to be highlighted because of the fact that the contingent wanting to go there exceeds 5.6 times the number of those students who are among the goers and also speak the language (37.2% and 6.6% respectively)

In contrast to the mentioned, the number of people who want to go to Russia is 6.6 times lower than the number of those who speak Russian language. Among large countries, Russia is the only one, where significantly less people want to go as opposed to the number of those who know Russian. In the same way, the number of those individuals who want to depart for Turkey exceeds nearly 1.6 times the number of those youngsters who know Turkish language (2.4% and 1.4% respectively).

Amongst those people who know a foreign language, the quotient of knowing a language is 1.18, which lags behind the average European indicator by almost 1.4 times (European Union – 1.6 and more). It is interesting that 60% of the students of European Union knew 2 and more languages in 2017. Furthermore, according to the situation in 2007 only 6% of the students did not know any languages.

According to the 2017 data, the unemployment level among the youth below 25 years-of-age is 28.9%, whereas among the rest of the population it is 2.3 times less and only 12.4%. Moreover, the number of those who receive salaries within the students' age range of 16-24 is only 16.3%, whereas the same indicator for people aged 25 and above is 1.8 times higher and amounts to 29.2%.

Therefore, low salary and generally unsatisfactory level of well-being, as well as a low perspective of finding a job and a high rate of unemployment among the youth are the primary factors, which substantially increase the youngster's motivation to go abroad. Despite the fact that today the contingent of those students who want to stay home exceeds almost 1.3 times the number of those students who plan on going abroad, from among the goers, who have a distinctly determined time limit for staying abroad, the average time period of being abroad is limited by nearly 2.5 years. However, it forces one to ponder that 43.4% of the goers do not have an established determination about *when they are going to return home.* 3.9% confess openly that they are permanently leaving Georgia, just when about 10 years ago the share of such a contingent constituted 2.8%.

For a country like Georgia, which does not include a large number of population, the readiness of the contingent of several tens of thousands of youngsters to go abroad and stay there, poses a serious threat to the social-economic and demographic development of the country.

Keywords: *Migration, Demography, Learning, Labor*

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Ab.60

The Main Challenges of Higher Education System Management in Georgia

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ABSTRACT

A close relationship between education, science and economics is the precondition for sustainable development in any modern country and society in which the main focus should be made on innovations and creative thinking and the implementation of its accomplishments. It is the primary role of education to be the basics for the sustainable development of the country, strengthen the knowledge-based society and economic prosperity, to enable each citizen to use all the opportunities and equal conditions for realization of personal and business goals. Social-economic strengthening and enhancing competitiveness of the country, which will in turn lead to the reduction of migration and the overcoming of poverty, is possible by carrying out the right educational policy. However, the development of a knowledge-based economy puts new demands for education, especially during the forming the basic knowledge, skills and values of human capital. Therefore, in the agenda for any country appears the necessity for both transformation and permanent development of the higher education system.

The information about the higher education and the labor market relation in Georgia is very little. This deficit primarily determines that there is no systematic approach to the analysis of the market and education system relation at the national level - the variables needed are not integrated in such important instruments as the population census questionnaires, tools of quarterly research. There is no comprehended data compatibility and aggregation strategy within the Ministry or outside of it that is responsible for analyzing of this type of data and does not define the strategy of integrating this information into the formation of higher education policy. For example, based on the National Statistics Office of Statistics, it is impossible to calculate the returns and relative benefits of higher education according to higher education stages (bachelor's degree, master's degree, doctoral studies), as well as the academic education directions, and its happening in the frame of the differentiated schemes of state financing which are governed by the Government (Under the Order #79/N of the Minister of Education and Science of Georgia, 2013-2014, the fee for studying some of the programs is fully funded by the state higher education

institution). Therefore, when identifying priority program trend, the Ministry does not rely on reliable empirical materials. (13)

During the last decade, the most important, large-scale complex reforms have been implemented in the educational system in order to provide the education policy based on the above mentioned results, through establishing a competitive environment based on the accessibility of education, quality of education and principle of justice. The higher educational system in Georgia has been gone through a difficult way to function in the market economy as a result of the collapse of the Soviet Union. However, today, despite the local and international competitiveness environment in order to occupy a certain niche in an international educational space systematically there are so many exchange programs for professors, students and administrative staff, international scientific conferences for academic staff as well as for students, encouragement and joint research programs, international summer schools etc. There is the necessity of internationalization of the higher education system, the main instrument for that is a membership in international organizations and associations.

This has led to the fact that the management, financing and quality management models and structure of the educational system substantially changed. The new structural model of decentralized management of the system was created, in which the autonomy of entities within the education system increased and new forms and systems of knowledge evaluation were introduced. In order to accelerate the innovative development of our country and improve the international competitiveness of Georgia, in the future, the state and private investments must be directed towards the development of human capital. In addition, we think it is necessary to work out the human resource management state strategy ensuring the modernization of the social management to improve the adaptation of the population to the market conditions and efficiency of the human resource use. This will lead to the intense and balanced social-economic development of the country in the final run. (Paresashvili, N., Okruashvili N., 2017)

Georgia joined the bologna process at the Bergen summit in 2005, as a result of which the Ministry of Education and Science of Georgia has been involved in the process of higher education reform in order to meet the common European standards. The Ministry periodically prepared official reports on the progress and implementation of Bologna Process Reforms. In 2018 there are 60 higher education institutions operating in Georgia, out of which 30 are three-stage university, 27 teaching universities and 6 colleges. Also, 8 Orthodox theological higher educational institutions are functioning.

However, despite the unprecedented multilateral, diverse, massive and permanent reforms of the last decade and their implementation, the higher education system is still facing complex challenges. The process of long-term and continuous reform of the education system, a wide range of amendments to the importance of the European Union, and the development of competitiveness in the international markets, has not yet achieved the desired outcome for the main goal, for which the transformation is planned. Graduates do not yet meet the demands of the labor market, which is the one of the reasons for the high unemployment rate. While the progress is shown, the situation is still unfavorable. It is necessary to outline the main cultural, language and professional hindering factors and mechanisms for their elimination in the conditions of permanent monitoring of the implementation of the internationalization strategy of the Georgian higher education system.

In this way learning process will have ability to keep up changing demands of society and achievements of scientific knowledge.Georgia should work to strengthen integration of the higher education system into the united European space. We consider that long-term vision of education system development must be created, which will include critical analysis of all components of this field and also will be based on main principles and methods of higher education marketing

It is also important to encourage the use of applied fields, practice oriented study in higher education institutions to increase the employment rate of graduates; For this reason, it is necessary to specify the role and responsibilities of the stakeholders towards the goal of providing demand-supply balance (higher education institutions, government, employers). Increase the role of employer in implementation and providing of study programs, quality assurance schemes and accreditation processes (Center for Higher Education Policy Studies, 2011).

In addition, a system of supporting youth employment and self-employment indicators should be created, which involves the involvement of higher education institutions in information delivery, mentoring and consulting, financial support and infrastructural support programs (incubators and youth business networks). (13)

Continuous observation is required to achieve high final results. The findings of the research, which are important for policy makers, indicate that the increase in employment indicators is possible to invest a larger share of GDP in education, and the effective strategy for increase in income indexes is to increase higher education and research financing (Ionescu, 2012).

As Georgia seeks to integrate into the European Higher Education Area, it is possible to imagine a situation as a hypothetical model when the higher education policy in Georgia envisages the enactment and refinement of the above strategies. (13)

In this way learning process will have ability to keep up changing demands of society and achievements of scientific knowledge.Georgia should work to strengthen integration of the higher education system into the united European space. We consider that long-term vision of education system development must be created, which will include critical analysis of all components of this field and also will be based on main principles and methods of higher education mamagement. (Okruashvili N., Veshaguri M.,2017).

Keywords: *Management, higher education management, education system development, competitiveness of higher education institutions.*

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Ab.61

Effectiveness of an Entrepreneurial Universities and Spin-offs: Experiences and Challenges

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ABSTRACT

At the end of the 20th century, a new term "entrepreneurial university" appeared in the scientific literature to describe universities that have improved various mechanisms to promote regional development and increase their incomes. Additionally, other terms used have been: University Technological Transfer, Innovative Universities, Business Universities and Market Universities. "The transformation of the university system is a worldwide phenomenon" (Etzkowitz and Leydesdorff, 2000, p. 121). "One significant European response is seen in the development, in concept and in practice, of the "Entrepreneurial University". To find a single definition of the Entrepreneurial University which works across the European Higher Education Area is difficult and controversial" (OECD, 2012, p. 1).

In the paper we shall try to analyze the scientific literature on the experience of different countries on entrepreneurial universities and spin-offs in several directions, namely:

1. We shall analyze government documents and state policy relevant to topic. We whall discuss the papers where the results of joint research of several entrepreneurial universities are given, such as: documents of European Commission (COM(2011) 567 final; COM SWD (2014) 164), Report of EENEE and OECD documents;
2. We shall discuss about the experience of different countries gathered in the formation of entrepreneurial universities. "Entrepreneurial answer (proactivity, innovativeness, capacity to assume risk, and managing change) of university is a chance for active participation in development of the society, in which knowledge becomes a right and an obligation for all" (peterka and Salihovic, 2012, p.98). In this context, we think it will be interesting to consider the views of many scientists, namely, Dahlstrand

(2007), Lazzeretti and Tavoletti (2005), Bak (2016), Bramwell and Wolfe (2005), Vesperi and Gagnidze (2018), etc.

3. We shall consider the experiences and challenges associated with the organization of successful spin-offs. "University spin-offs have remarkably strengthened the linkage between universities and industry. The number of technology patents and spinoffs coming out of university research has a significant impact on regional economic and social development" (Pattnaik and Pandey, 2014, p.44). In this context we shall discuss the appropriate papers, namely: Caiazza and Volpe (2014), Berbegal-Mirabent et al., (2012), Culkin (2013), Di Fatta et al., (2018), Gübeli and Doloreux (2005), Corsi et al., (2017), Beraza-Garmendia and Rodríguez-Castellanos (2015), Bakouros, and Samara (2010), Vesperi et al., (2018) etc.

Keywords: *entrepreneurial university, Spin-offs.*

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Ab.62

Regional Development Inequalities in Georgia and Ways of its Solutions

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ABSTRACT

The purpose of the presented paper is to provide theoretical-practical analysis of socio-economic development inequalities of the regions in Georgia and its specific reasons, to develop concrete recommendations that will promote sustainable and rapid development of the regions and thus reduce the inequalities of regional development. To achieve the objective of the research we have the following tasks:

- Study of the current level of socio-economic development of the regions in Georgia, analyzing the inequality of regional development and identifying its causing reasons;
- Develop specific recommendations that will facilitate the elimination of regional development inequalities and sustainable development of the regions, their attractiveness and prestige in the regional, national and especially international levels.

In order to achieve the main goal and objectives of the study there are widely used the publications of scientists interested in the region's competitiveness and regional management, marketing and management issues, materials of the conferences held in the field of this above-mentioned research topic, Statistical data and analytical reports of the National Statistics Office in Georgia, Ministry of Economy and Sustainable Development, Ministry of Finance of Georgia, international financial organizations.

The region is an open agricultural system and its functioning is influenced by lots of factors. Nowadays, nine regions are functioning under the territorial arrangement in Georgia, which are not local self-governing entities. They have only coordination and advisory functions between self-governing entities and the government of Georgia. In these regions, the government is the state attorney - the governor, the capital of Georgia has all the legal powers which are assigned to the region.

The absence of the mechanisms supporting the development of the regions is causing serious damage. Therefore, the overcoming factors should be the object of permanent care and urgent intervention. Economic and cultural degradation of the regions followed the economic and social backwardness of the whole country. Making wrong policies towards the regions, the mistakes made in their development led the population to live in the center of the country, leaving the entire regions. The backwardness of the regions, their unparalleled development has become particularly evident today when the country has made a clear sign of the formation of market relations. However, this road will not automatically resolve disproportions in the development of the regions. According to the official statistics data, by 2017 the inequalities of regional development were further enhanced. The unemployment rate in Georgia's regions such as Imereti and Kvemo Kartli is 3 times higher than the level of unemployment in Kakheti and Guria. The low level of economic activity in the regions largely drives the unfavorable migration processes, becoming the reason of the migration process of economically active population in the capital and in other countries. The artificial aging of the region's population and the economically active population is further worsening the socio-economic situation of the region and the future prospects of using their rich natural-recreational resources are also under suspicion. This fact is added to the fact that in the regions the amount of direct foreign investments decreases. In 2017, compared to 2015, only foreign direct investment has increased just in the capital of the country, and in a big amount of the regions there is a significant reduction. In regions such as Kakheti and Samtskhe-Javakheti, there is a reduction in FDI volume. Reduced external investments in the region, undesirable level of domestic investment can not be able to become a base for overcoming the existing crisis situations in the regions.

Nowadays the regional socio-economic analysis of the situation provides an opportunity to state a conclusion that the local authorities cannot provide such kind of management system that will stimulate the self-developmentof the economic and social spheres, provide the solutions for the regions' acute social problems and work out the regions'unmet needs.

The paper concluded that the reduction of inequalities in regional development and the overcoming of social and economic backwardness of Georgian regions is possible only through a marketing strategy developed and implemented on a comprehensive and systematic analysis of the region. On the basis of the objective analysis of the needs of the region's population, the interests of the internal as well as the external stakeholders of the region, the priorities of the region should be defined. The work has been elaborated with the specific recommendations that will support sustainable development of the region and the elimination unjustified disproportions in the regions. The growth and the development of the region should be entirely linked to the regional marketing, as its priority direction of the interconnected and coordinated measurement system and practical implementation.

Keywords: *Regional development, regional management, regional marketing, competitiveness of the region.*

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